

November 21, 2010

To: Senator Ron Wyden
Senator Jeff Merkley
Representative Greg Walden

Fr: Aviation Recruitment Committee
Economic Development for Central Oregon

RE: Proposal for legislation or other assistance to establish an Unmanned Aerial Systems (UAS) testing area near Bend

The purpose of this memo is to request an amendment to the FAA reauthorization bill or other action necessary to establish a test area for Unmanned Aerial Systems (UAS) within an hour's drive of Bend, Oregon. This test area would be one of several envisioned across the country (primarily in the West), thereby providing additional solutions to the problem and also generating broader political support.

Background

Unmanned Aerial Systems (UAS), also known as unmanned aerial vehicles or drones, have become a major tool in finding and destroying terrorist groups and small military units. They have tremendous potential for other uses including general battlefield support, border patrol, wildlife management, environmental research, weather monitoring, forest and forest fire management, pipeline patrol, and for domestic law enforcement activities such as drug interdiction or surveillance.

Being developed in sizes ranging from insects to airliners, UAS represent the future of American military aviation. Thirty-five percent of all aircraft ordered by the Air Force next year will be UAS, and the Air Force's Unmanned Aircraft System Flight Plan predicts that UAS will replace nearly every manned plane—from fighters to tankers to bombers—by mid-century.

In a battered economy, UAS also represent the only segment of the aerospace industry likely to grow to any degree in the next few years. Pentagon and CIA spending together will top \$5 billion in 2010 and is expected to increase. Civilian use is likely to be as varied as military or law enforcement use.

Current R&D spending alone approaches nearly \$2 billion: \$451 million for the Air Force; \$453 million for the Army; \$861 million for the Navy and Marine Corps; and \$55 million for Special Forces.

The United States should lead the world in this new technology platform as it has in other new technologies. Current rules, however, are stifling UAS development.

The Federal Aviation Administration (FAA) has a legitimate need and duty to protect the public from uncontrolled UAS flights until the technology exists to safely integrate them into National Airspace System (NAS). The public does not want dozens of UAS flying over major cities with the potential of colliding with each other or with manned aircraft.

For this reason, the FAA severely curtails UAS flights in the U.S. Its stringent rules, however, fail to distinguish between general UAS flights over populated areas and limited test flights needed to develop new technology—including technology that would enable them to fly safely in the NAS!

Currently, the FAA allows UAS flights under extremely limited, highly burdensome circumstances:

- In **Restricted airspace**: these are military areas in which civilian traffic is always excluded. The U.S. has a limited number of Restricted areas, and all of these are overbooked with existing manned and unmanned aerial missions. Restricted areas have wait times of six months or longer for UAS testing—and are essentially unavailable for the many new designs and technologies being developed.
- Under a **Special Airworthiness Certificate**: Applicable to private sector requests for flights outside of Restricted areas. In five years, the FAA has approved only 17 different UAS types for flight by civilian makers outside of Restricted areas.
- Under a **Certificate of Authorization (COA)**: A COA is applied when the testing is in concert with a public agency. The authority is most commonly applied to defense-related testing, but has also been applied to U.S. Border Patrol programs and university research.

The number of COAs approved for public agencies is much higher (138 different aircraft types), but each application is time-consuming and expensive.

It appears that the FAA has no plans to change its rules for at least four years, when the FAA believes technology will exist to separate UAS from manned flights.

Both airworthiness certificates and COAs include many onerous limitations:

- Each one must be for a particular aircraft with specific equipment, specific capabilities, specific test procedures, etc. Every significant variation on the vehicle—from design changes to new avionics or sensors—requires a new and time-consuming airworthiness certificate or COA.
- It can take two years to obtain approval for an all-new system. The process is expensive, involving outside consultants for systems analysis, safety evaluation, and shepherding the application through the FAA. Typical consultant fees are \$1,500 per day, and the process seldom takes less than six months. Both types of certificates lapse after a year, though renewal is usually easier.

- The more “experimental” in nature the UAS is (untested airframe, engine, systems, etc.), the more difficult it is to obtain a COA (greater risk). The type of vehicles most in need of testing—ones involving new concepts, new technology, or an as-yet-identified need—are the ones for which it is most difficult to obtain certificates.
- The requirements, and likelihood of approval for an airworthiness certificate or COA, vary from region to region within the FAA.

FAA review for each individual COA consumes an enormous amount of time for FAA personnel that could be better spent on other safety matters.

The one-by-one FAA approach has led to a condition which is obstructive to national defense and contrary to common sense. For example:

- The Air Force in North Dakota has six Predators “sitting in boxes” because it has no allowable place to fly them, and no way to train crews in actual flights. The COA process does not provide the general airspace required, and the FAA has refused to provide separate air space despite pressure from Sen. Byron Dorgan, D-N.D.
- The Department of Defense has designated the Pacific Northwest as the technical development cluster for UAS. However, the entire region has only two or three small Restricted areas where UAS can be tested, and these are booked up.
- In Oregon, for instance, the only permissible Restricted area is the Boardman Bombing Range near Pendleton. It is small and remote, many hours removed from most UAS manufacturers, and already has as many UAS test flights as it can reasonably conduct. Washington has one or two areas even smaller, and they are close to populated areas.
- Manufacturers must travel out of the region for most testing, and even outside test areas are not available for months in advance.

The nation needs **large, remote areas** in which UAS can be safely tested away from other aircraft. The nation, in fact, has such places. They are Military Operations Areas (MOAs), where military aircraft routinely practice maneuvers. There are many days every month when MOAs are not being used by the military. *When remote MOAs are free, the FAA should establish Temporary Flight Restrictions (TFRs) on a regular basis for use by UAS.* Such use should be established around and in deference to military needs.

The reason to use the MOAs is that they are well-defined, they appear on all aviation maps, most airways go around them, and most of them have been in place for decades. Pilots are well familiar with them.

Use of MOAs for UAS should continue until the technology has been developed to allow free flight of UAS in general airspace. The Air Force predicts such technology will be available in two to five years. It is not known how long it might take the FAA to approve such technology.

TFRs will protect UAS test flights from incursions by other aircraft. Because of the remoteness of MOAs, few civilian aircraft will be affected.

The FAA routinely issues TFRs for presidential flights, air shows, wildfires and other natural disasters, major sporting events, and celebrity weddings, among other things. The FAA routinely issues TFRs for UAS border patrols and for regular UAS flights over Beale Air Force Base in California. In sum, the FAA has established TFRs for many purposes. Some of the TFRs are considerably less critical to national security than development of a new branch of aviation technology, and many of the TFRs have much greater impact on routine flights.

Benefits to Oregon

There are a dozen or more MOAs in the West that might qualify for UAS test areas. It is likely that only a handful of these will prove feasible for UAS flights. Of them, the Juniper North and South MOAs, though remote from most air traffic, are close to Central Oregon. The Juniper MOAs extend roughly east to west from Brothers to Burns, and south from those two towns to between Paisley and Frenchglen. A UAS testing area here would become a significant economic asset:

- A dozen companies have already said they would use a UAS test area in Juniper and will provide letters of support. Such companies would bring immediate lodging and restaurant business to the area via testing crews.
- A test area will lead companies to establish satellite facilities in the region. Given that Central Oregon already has a large cluster of aviation businesses (several of whom already provide UAS components and systems)—and available manufacturing facilities—it is likely that these satellite facilities will become the springboard for full-scale design/certification, flight testing, and manufacturing of UAS. A UAS test area is the critical missing link for any firm involved with UAS or seeking to become involved. Any new operations are likely to start as close to a test area as possible.
- A UAS test area provides a significant asset to the aerospace firms already here seeking to obtain UAS design, manufacturing, systems, or assembly work, including: Lancair, Epic Aircraft, Outback, Precise Flight, Windward, and others.
- If the state captured just 5% of the R&D spending, the economic benefit would be \$75 million per year.
- Northwest businesses will reduce their costs, get products for military and civilian use to market faster, and improve the quality of life for staff while they are on the road for testing. These firms include: Insitu, Boeing, Evergreen Aviation, and others.

Actions Requested

We ask that the Oregon delegation advance this proposal either as an amendment to the FAA reauthorization act currently before Congress, or through other legislative or administrative avenues.

Proposal

We propose the following as elements of either an administrative policy or legislation for the purpose of enabling one or more active UAS testing areas in remote areas of the United States:

The FAA should establish a program to certify or identify Military Operations Areas suitable for the testing of Unmanned Aerial Systems (UAS) or to train their crews. The program would establish criteria for identifying such areas. Alternatively, Congress could designate one or several specific areas. In both instances, we are confident that our region would emerge as one of the nation's top prospective locations for this use.

We propose that the FAA use TFRs in Military Operations Areas (MOAs) in the United States for the testing of civilian Unmanned Aerial Systems (UAS), provided that such MOAs are well away from major population areas. Such use would occur only when the military is not using the MOA.

We submit the following as possible elements of a successful program:

1. The controlling military authority (defined as the military authority that is the primary user of the MOA) would retain control over the MOAs, and military missions would take priority.
2. When the MOA is not in use by the military, the FAA would issue a TFR for the time period and place for UAS flights requested. The TFR would be similar to those created for fires: X miles in radius, on Y radial of a certain navigational fix, thereby taking up only as much of the MOA as necessary. The TFR would be issued for the entire MOA only when absolutely necessary.
3. The FAA would receive at least 24 hours' notice for the TFR.
4. The MOA/UAS test area should be at least 25 miles from any Class B airspace.
5. No primary airport or airport with commercial service exists within the MOA.
6. The MOA covers sparsely populated rural areas, defined as meeting any of the following conditions: a majority of the land area is public land; the land area encompasses counties that are formally designated "frontier" counties; the land area as a whole has a population density of less than six persons per square mile.

7. Because of the remoteness of the MOAs and exclusion of other aircraft via the TFR, we propose that, for UAS flying within MOAs, the program would replace the existing requirements for separate Airworthiness Certificates or Certificates of Authorization (COA). The only requirement would be that the UAS must have systems in place that will keep it within the MOA boundaries if control of the vehicle is lost.
8. Civilian UAS flights would be scheduled on a first-come, first-served basis.
9. UAS operators would provide, at their cost, a contractor to serve as a single point of contact with the FAA to coordinate UAS flight requests.
10. Any aircraft that enters the MOA while the TFR is active would be responsible for all damages and liability if it collides with or causes the crash of a UAS. Responsibility includes any and all damage on the ground.
11. Otherwise, if the UAS causes any damage on the ground as the result of a crash, or of a landing or crash outside the MOA, or for any other damages caused by an excursion outside the MOA, the operator would be responsible for all damages and liability.
12. Because the characteristics of UAS flight testing are benign, relative to the existing use of a MOA, we would expect that no additional NEPA compliance (environmental analysis) would be required to proceed with UAS flight testing.
13. Before formal designation of a UAS training area, the civilian operators, at their expense, shall hold at least three public hearings, with at least one week of published notice for each, in the three largest towns in or nearest to the MOA, explaining the new uses of the MOA and the operating procedures for them.

Special Operating Requirements

During the first year of operation, the following restrictions would apply to UAS flights in a MOA designated for UAS flight testing:

1. All flights will be limited to daylight hours.
2. All flights will be under Visual Flight Rules (VFR).
3. Up to three UAS may be in the air at the same time if each of their wingspans is less than five feet. Otherwise, no more than one UAS may be in the air at any one time.
4. Except for takeoff and landing, flights will be carried out above 500 feet AGL and below 18,000 feet MSL.
5. Takeoff and landings must occur within the MOA.

6. To minimize the exposure of the UAS under 500 feet AGL, the UAS will circle the takeoff point until reaching 500 feet AGL.
7. The UAS will restrict its descent for landing to as close as possible over the landing spot.
8. No Instrument Flight Rules (IFR) flights for UAS will be allowed until the FAA has developed IFR procedures for general UAS flights.

After the first year of operation, with agreement from the FAA, these restrictions could be lifted.

Jurisdictions

When a MOA is inactive (“cold”), it is part of the NAS under the authority of the FAA. Some MOAs have airways crossing them. These airways are considered controlled airspace. Below 18,000 feet, most MOAs are uncontrolled airspace, meaning aircraft can generally fly without restriction. When the MOA is active (“hot”), it is under control of the military, usually the Air Force or Air National Guard.

Juniper consists of a smaller north MOA and larger south MOA. There are no airways in the Juniper North MOA. Only one airway, between Lakeview and Burns, crosses the Juniper South MOA; it has little traffic. When either MOA is active (“hot”), it is operated under the authority of the First Air Force at McChord AFB in Washington and the Oregon Air National Guard. The MOAs are primarily used for training by Air National Guard F-15s from Klamath Falls and for operational practice by Air National Guard F-15s out of Portland. There are rare combined missions with other air wings.

When a MOA is hot, IFR aircraft are separated by ATC from military aircraft—usually by flying above or being vectored around the MOA. VFR aircraft are advised to avoid the MOA, and most do; however, they can transit the MOA at their own risk on a “see and avoid” basis. A TFR would exclude VFR aircraft as well as IFR aircraft.

Key Contacts

Key contacts for understanding the various elements of this proposal are as follows:

Bend:

- Collins Hemingway, chair of aviation recruitment committee, EDCO; 541-389-1258; collinshemingway@hotmail.com.
- Jeff Witwer, co-chair of aviation recruitment committee, EDCO; member of NW regional UAS trade group, AUVSI; 541-317-8306; jeffwitwer@yahoo.com.
- John Lynch, Outback Mfg., 541-330-1046, john@outbackmfg.com, UAS supplier, member of NW regional UAS trade group, AUVSI.
- Roger Lee, director, EDCO, 541-388-3236.

FAA:

Les Dorr, Jr or Alison Duquette: (202) 267-3883

http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=6287

Supporters

All UAS manufacturers and suppliers: Major vendors such as Boeing and Lockheed along with many small developers and suppliers of UAS are interested. A dozen or more members of the trade group Northwest AUVSI will likely provide written support upon request.

Business groups will welcome innovative projects that will generate new industry. City councils and county commissions in Central Oregon have indicated informal support; they will likely vote formal support if requested.

Issue Identification

Military: If the military perceived this as an encroachment upon their mission, they would oppose it. In actuality, if a MOA is “cold”—not being used by the military—it is just regular airspace and anyone can fly in it without military permission. We propose protecting the military’s primacy of mission while enabling UAS systems—many with military applications—to be developed sooner.

Aircraft Owners and Pilots Association (AOPA) and other pilot organizations: General aviation pilots normally oppose new airspace restrictions, but such restrictions normally limit their abilities to fly in and around major cities. The remoteness of MOAs limits the impact on GA pilots. Those who fly near MOAs routinely fly around or over them (above 18,000 feet).

Many GA pilots are businesspeople and entrepreneurs who will recognize the value of UAS test areas to developing the industry. The AOPA would need to be brought in early to avoid an initial negative. Several members of this Aviation Recruitment Committee are active members of AOPA and are willing to work with AOPA on this matter.

A small and informal survey indicates that roughly half of general aviation pilots would support the measure and roughly half would oppose. Those most concerned are pilots near large cities, where they already face serious flight restrictions. The MOAs under consideration are well away from major metropolitan areas and would not impinge on these pilots.

The fact that TFRs would be in place only until the FAA approves free flight of UAS in the NAS could reduce pilot concerns.

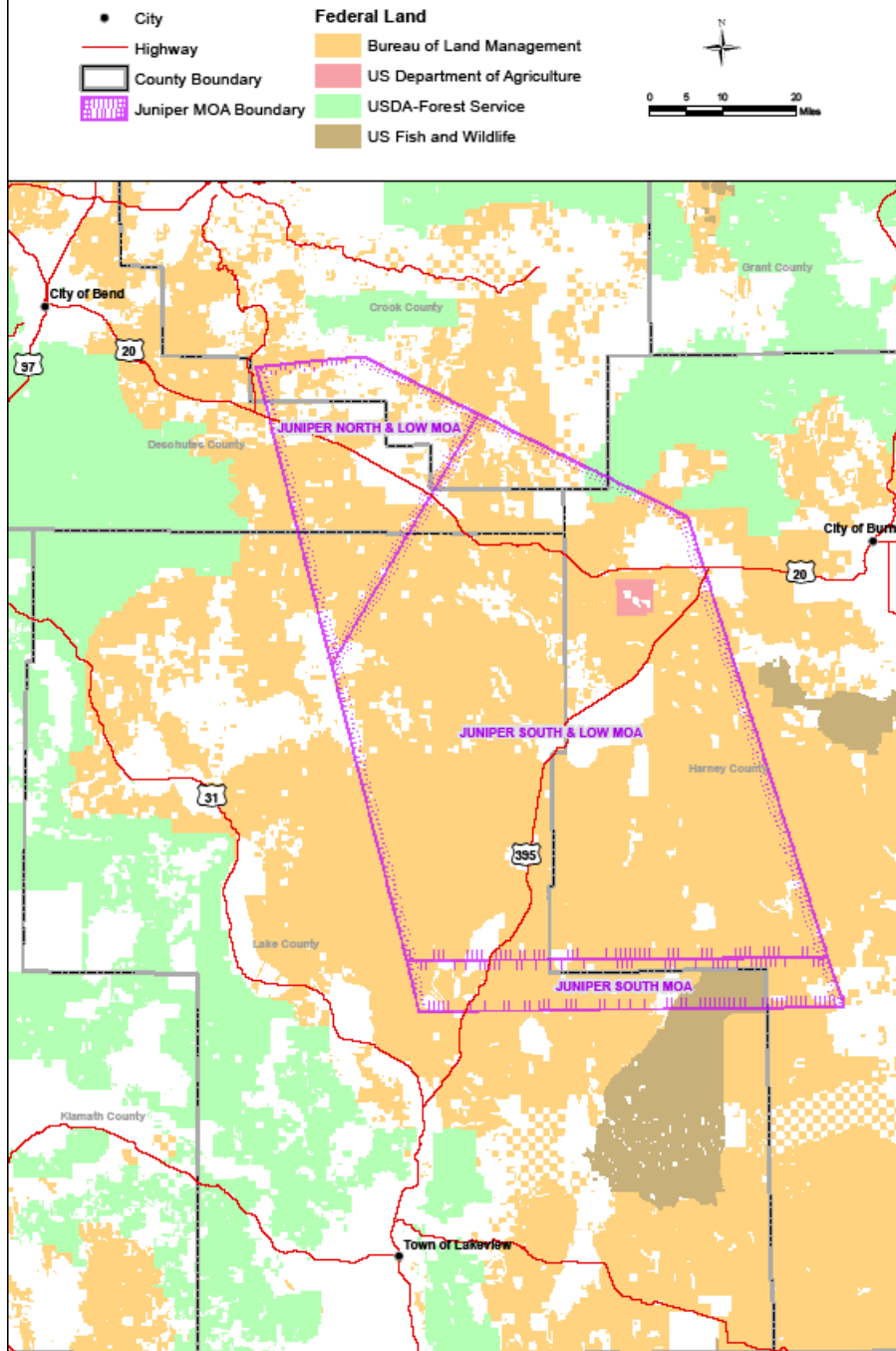
Airlines and airline pilots: The remoteness of MOAs means that airliners will be well above 18,000 feet when near a MOA. No UAS flights will be allowed above 18,000 until proper IFR procedures are established to separate UAS from airlines and other IFR flights.

In general, the aviation industry should be happy to have the UAS issue pushed into remote areas and away from congested airspace until the FAA resolves the issue system-wide.

Local ranchers and farmers: They will likely not wish additional flights per week by any aircraft, but there is no direct impact on their operations. A few ranchers may have small planes that they can legally fly under the MOA (under 500 feet or 1500 AGL); these could be impacted by the TFR on certain days. Smaller TFRs within a MOA would minimize or eliminate this issue.

FAA: The FAA appears unlikely to approve any general UAS flights in the NAS in the next several years. If the “innovation” mindset of the FAA prevails, it likely that the FAA will support efforts to accelerate UAS *testing* while keeping these and general UAS flights separated from other air traffic. If the “regulation” mindset prevails, the FAA will likely require specific authorization from Congress before moving forward.

JUNIPER MOA



Data Sources:
MOA: digitized using <http://cityvector.com/>
Oregon GEO: <http://www.oregon.gov/DASIS/FOI/EOEdLibrary.shtml>

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Juniper MOA in Oregon is a perfect example of large, remote areas where unmanned aerial vehicles (UAS) can be safely tested away from normal aircraft traffic. Almost all of the land is public, the area has few inhabitants, and no major airports lie within or near the range.