

## UNMANNED AIRCRAFT SYSTEMS

### Use in the National Airspace and the Role of the Department of Homeland Security

Highlights of [GAO-12-889T](#), a testimony before the Subcommittee on Oversight, Investigations, and Management, Committee on Homeland Security, House of Representatives.

#### Why GAO Did This Study

UAS aircraft do not carry a human operator on board, but instead operate on pre-programmed routes or by following commands from pilot-operated ground stations. An aircraft is considered to be a small UAS if it is 55 pounds or less, while a large UAS is anything greater. Current domestic uses of UAS are limited and include law enforcement, monitoring or fighting forest fires, border security, weather research, and scientific data collection by the federal government. FAA authorizes military and non-military UAS operations on a limited basis after conducting a case-by-case safety review. Several other federal agencies also have a role or interest in UAS, including DHS. In 2008, GAO reported that safe and routine access to the national airspace system poses several obstacles.

This testimony discusses 1) obstacles identified in GAO's previous report on the safe and routine integration of UAS into the national airspace, 2) DHS's role in the domestic use of these systems, and 3) preliminary observations on emerging issues from GAO's ongoing work.

This testimony is based on a 2008 GAO report and ongoing work, and is focused on issues related to non-military UAS. In ongoing work, GAO analyzed FAA's efforts to integrate UAS into the national airspace, the role of other federal agencies in achieving safe and routine integration, and other emerging issues; reviewed FAA and other federal agency efforts and documents; and conducted selected interviews with officials from FAA and other federal, industry, and academic stakeholders.

View [GAO-12-889T](#). For more information, contact Gerald Dillingham at (202) 512-2834 or [dillingham@gao.gov](mailto:dillingham@gao.gov).

#### What GAO Found

GAO earlier reported that unmanned aircraft systems (UAS) could not meet the aviation safety requirements developed for manned aircraft and posed several obstacles to operating safely and routinely in the national airspace system. These include 1) the inability for UAS to detect, sense, and avoid other aircraft and airborne objects in a manner similar to "see and avoid" by a pilot in a manned aircraft; 2) vulnerabilities in the command and control of UAS operations; 3) the lack of technological and operational standards needed to guide the safe and consistent performance of UAS; and 4) the lack of final regulations to accelerate the safe integration of UAS into the national airspace. GAO stated in 2008 that Congress should consider creating an overarching body within the Federal Aviation Administration (FAA) to address obstacles for routine access. FAA's Joint Planning and Development Office (JPDO) has taken on a similar role. FAA has implemented GAO's two recommendations related to its planning and data analysis efforts to facilitate integration.

The Department of Homeland Security (DHS) is one of several partner agencies of JPDO working to safely integrate UAS into the national airspace. Since 2005, FAA has granted DHS authority to operate UAS to support its national security mission in areas such as the U.S. northern and southern land borders. DHS's Transportation Security Administration (TSA) has the authority to regulate security of all modes of transportation, including non-military UAS, and according to TSA officials, its aviation security efforts include monitoring reports on potential security threats regarding the use of UAS. Security considerations could be exacerbated with routine UAS access. TSA has not taken any actions to implement GAO's 2008 recommendation that it examine the security implications of future, non-military UAS.

GAO's ongoing work has identified several UAS issues that, although not new, are emerging as areas of further consideration in light of greater access to the national airspace. These include concerns about privacy relating to the collection and use of surveillance data. Currently, no federal agency has specific statutory responsibility to regulate privacy matters relating to UAS. Another emerging issue is the use of model aircraft (aircraft flown for hobby or recreation) in the national airspace. FAA is generally prohibited from developing any rule or regulation for model aircraft. The Federal Bureau of Investigation report of a plot to use a model aircraft filled with plastic explosives to attack the Pentagon and U.S. Capitol in September 2011 has highlighted the potential for model aircraft to be used for unintended purposes. An additional emerging issue is interruption of the command and control of UAS operations through the jamming and spoofing of the Global Positioning System between the UAS and ground control station. GAO plans to report more fully this fall on these issues, including the status of efforts to address obstacles to the safe and routine integration of UAS into the national airspace.

**Figure 1: Example of a Small UAS (SkySeer) and a Large UAS (Predator)**



Sources: Octatron, Inc. and DHS.