



The Benefits of Unmanned Aircraft Systems: ***Saving Time, Saving Money, Saving Lives***

Unmanned aircraft systems (UAS) extend human potential and allow us to execute dangerous or difficult tasks safely and efficiently, saving time, saving money and, most importantly, saving lives. Recently, legislation was signed into law that will help safely and responsibly unlock the tremendous potential of UAS to keep the public safe, create lasting jobs, boost local economies, and further advance the U.S. as a leader in technology and innovation.

Legislative Background

On February 14, 2012, President Barack Obama signed into law legislation reauthorizing the Federal Aviation Administration (FAA). As part of that legislation, Congress, for the first time ever, included a provision requiring the FAA to safely integrate UAS into the national airspace. The bill creates a number of deadlines for the FAA to meet on its way to the safe integration of UAS by September 2015. Key FAA milestones include:

- August 2012: Plan and initiate a process for designating areas in the U.S. Arctic where small UAS can operate for research and commercial purposes
- November 2012: Develop a comprehensive plan to safely accelerate the integration of civil UAS into the national airspace
- December 2012: Establish a program for and select six UAS test sites across the country
- February 2013: Release a five-year roadmap for comprehensive UAS integration
- August 2014: Publish a final rule on the integration of small UAS into the national airspace
- September 2015: The safe integration of civil UAS into the national airspace

In addition, on May 14, the FAA announced an agreement with the U.S. Department of Justice to launch a new program allowing law enforcement expedited authorization to use UAS.

Public Support for Unmanned Aircraft Systems

The use of unmanned aircraft systems to enhance public safety is broadly supported by the American public. According to a recent national poll conducted by Monmouth University:

- 80 percent of Americans support the use of unmanned aircraft to help in search and rescue missions
- Two-thirds of Americans support the use of UAS to track down runaway criminals
- Nearly two-thirds of Americans support the use of unmanned aircraft to protect U.S. borders and control illegal immigration

The poll, which surveyed 1,708 adults and has a margin of error of + 2.4 percent, was released on June 12, 2012.

The Benefits of Unmanned Aircraft Systems

UAS provide a host of societal benefits that make our citizens safer, more secure and more productive. These aircraft help police, fire and other first responders save lives in the event of natural disasters, locate missing children and help fight wildfires. They assist the Coast Guard in rescue missions and help the Border Patrol keep our nation secure. They boost agricultural production and allow us to better protect the environment. Moreover, UAS have virtually no limitations, with the ability carry out such work in hazardous conditions, darkness, extreme heat and a host of other conditions that may pose significant risks to manned aircraft.

Enhancing Public Safety

For police, firefighters and other first responders, UAS provide superior situational awareness while minimizing the danger to which they are exposed. And with public resources in short supply due to tight budgets, UAS provide a cost-effective solution for public safety agencies working to enhance public safety more efficiently. Today, fewer than 3 percent of law enforcement units have aviation assets to support their daily operations because of the high operating costs of manned aircraft. UAS would change this, allowing such agencies to better protect themselves as they work to protect us — and at a fraction of the cost. Here are some of the ways federal, state and local agencies are using UAS to enhance public safety:

- U.S. Customs and Border Patrol are currently using UAS to monitor the border to help interdict illicit trafficking. Local authorities in both Arizona and Texas are using a total of six UAS vehicles to assist with border surveillance as well.
- In January 2012, the Mesa (CO) County Sheriff's office has been a pioneer in law enforcement's use of UAS. The agency has already used the technology to provide aerial photography of car accidents, assist fire departments fighting wildfires by detecting hot spots and providing situational awareness. The agency also sees it as a tool to aid search and rescue efforts. The use of UAS is also cheap, with the direct operational cost totaling \$3.36 per hour, compared to \$250 to \$600 per hour for a manned aircraft.
- The Arlington (TX) Police Department owns two 11-pound helicopters it hopes to use for specific missions including search and rescue, natural disaster recovery, documenting crime scenes and fatal traffic crashes.

Mitigating Disasters – Natural and Manmade

When disaster strikes, UAS can play invaluable roles in analyzing and mitigating their impacts when time is of the essence. Natural disasters such as volcanoes present conditions too dangerous to observe with manned vehicles. Manmade disasters such as leaks at a nuclear power plant also prove too hazardous for humans, making data collection difficult and slowing the response. Under human control and operated remotely, UAS can enter hazardous spaces for long periods of time in a way that humans simply never could.

- Following the 2011 earthquake and resulting tsunami that impacted Japan, unmanned vehicles were used to conduct surveillance and check radiation levels at the damaged Fukushima Nuclear plant, which was too hazardous for humans to approach.
- The University of Alaska demonstrated the use of a 3-pound unmanned aircraft that could gather 3-D aircraft data to aid oil spill cleanup efforts and ensure minimal environmental impact.
- UAS were dispatched after Hurricane Katrina, able to search for people stranded by floodwaters much more quickly than emergency responders who ventured out in rowboats.
- In 2010, researchers at the University of North Dakota used UAS to capture real time images of the flooded Red River in the upper Midwest and provided data absolutely necessary for flood research, rescue, and planning.

Protecting the Environment

Environmental organizations and governments can use unmanned aircraft systems to monitor forests for illegal logging, protect green space, observe wildlife and monitor erosion. UAS also examine power plants and other structures for leaks that could pose environmental risks.

- The state of Utah and the U.S. Department of Agriculture have used small unmanned helicopters to monitor erosion and silt deposits in rivers, a task too hazardous for manned helicopters that would face high winds and dust storms.

- Nicholls State University is testing a new kind of unmanned aircraft to track coastal erosion and the health of Louisiana's barrier islands, which are an important habitat for migratory birds, as well as a frontline protection against hurricanes.
- Scientists working with the World Wildlife Fund are using unmanned aircraft to monitor areas for poaching and other illegal activities. In June 2012, two unmanned aircraft equipped with GPS and a camera, were tested in Nepal's Chitwan National Park, home to the endangered Bengal tiger and Indian rhinoceros. Researchers hope the added eyes will help their efforts to detect and prevent poaching.
- NASA researchers in California have used unmanned aircraft to collect very low altitude airborne measurements of greenhouse gases, saying the new aircraft capability has the potential to provide critical measurements of carbon fluxes. The research will assist scientists in their understanding of carbon dioxide cycling between the land, ocean and atmosphere.

Enabling Scientific Research

UAS will provide new vantage points for researchers, giving them perspectives never attained before. UAS also remove the risk researchers previously faced while flying in helicopters through hazardous conditions or over difficult terrains.

- NASA is equipping two UAS with the most advanced weather equipment on the planet as part of a three-year project to study hurricanes, which may unlock the secret as to why tropical storms transform into lethal hurricanes.
- After fellow researchers were killed in a helicopter accident, an Idaho biologist led an effort to invest in UAS to count salmon nests in Idaho waterways. Not only does the use of UAS make the research safer, it also can be less expensive, saving critical research funding.
- In Nevada and California, NASA is utilizing UAS to measure greenhouse gases and better understand carbon dioxide cycling between the land, ocean and atmosphere.

Efficiency in Agriculture

The incorporation of UAS is a growing trend in agriculture, as it enables precise crop management that can boost production and save farmers millions of dollars in time and resources. UAS also provides farmers with a cost efficient way to spray for pests and diseases, manage their crops, and check for signs of drought and blight.

- Scientists in the U.S. have begun using small remote-controlled helicopters to help farmers detect diseases and stress in their crops. The helicopters take photographs and measurements that allow farmers to keep an eye on their large fields.
- Japan uses more than 2,300 small unmanned helicopters to spray difficult to reach rice fields, while also monitoring the health of the crop.

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The Association for Unmanned Vehicle Systems International (AUVSI) — the world's largest nonprofit organization dedicated to the advancement of unmanned systems — represents more than 7,000 members from 55 allied countries and 2,500 organizations involved in the fields of government, industry and academia.