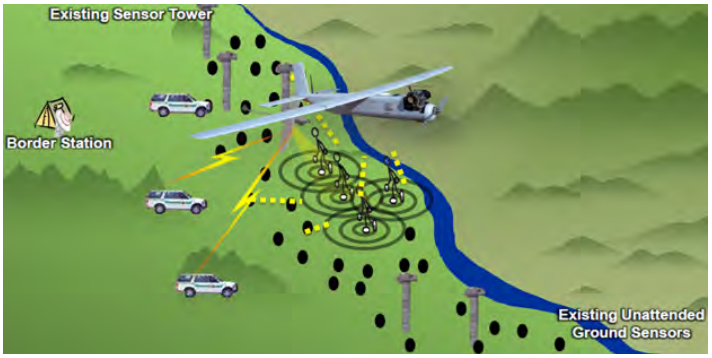
DHS Science and Technology Directorate

Air Based Technologies

Problem: The Department of Defense and industry have developed airborne surveillance systems that could be repurposed/adapted/leveraged to dramatically improve situational awareness of remote regions of the U.S. border. Also, the Department of Homeland Security (DHS) operating components have the responsibility to reliably and accurately detect, track and classify all low, medium and high altitude airborne threats, including Unmanned Aircraft Systems (UAS), ultralights, gyrocopters, helicopters and fixed winged aircraft. The difficult terrain and harsh environment of the northern and southern borders pose extreme difficulties for a system to reliably and accurately detect, track and classify aircraft of all sizes.

Solution: The Air Based Technology project identifies, tests and evaluates sensors mounted on a variety of manned air platforms for possible use by DHS components for improved detection, classification and tracking of illicit activity. It also provides DHS components and the first responder community with unbiased assessments of airborne surveillance systems for law enforcement, search and rescue, disaster response and border and maritime security missions. This project will also work with the DHS Science and Technology Directorate's (S&T) Program Executive Office for Unmanned Aircraft Systems to assist with UAS-specific operations.

Impact: Airborne sensors and sensor systems will provide DHS operating components and first responders with invaluable situational awareness before making the decision to dispatch agents/assets to respond to and engage in potentially dangerous operations. This project will improve the U.S.Customs and Border Protection (CBP), U.S. Coast Guard (USCG), U.S. Immigration and Customs Enforcement (ICE) and the first responder community's awareness and usage of mature air based technologies for border security and public safety missions, resulting in more effective allocation of assets on local, regional, and national levels.



Aircraft mounted sensors provide critical situational awareness of the border

Quadcopter style Small Unmanned Aircraft System (sUAS)

Current and Future Investments

- **Small UAS (sUAS) Sensor Testing and Evaluation.** UAS are essential for rapid response and gaining invaluable situational awareness before engaging in potentially dangerous operations. DHS S&T will continue to evaluate current sUAS platforms and sensors for homeland security operational communities and stay informed of the systems and their capabilities.
- **Sensor Evaluation (manned aircraft).** Maritime and land sensor packages, including Wide-Area Surveillance, Multi-spectral, Light Detection and Ranging, Short Wave Infrared and others, will be evaluated for possible integration into current and/or projected manned aircraft fleets.
- **sUAS Enabling Technologies.** DHS S&T is partnering with the National Aeronautics and Space Administration in the development of a UAS Traffic Management (UTM) system to enable the use of UAS beyond the line of visual sight. Also, DHS operational components operate in regions where GPS is denied and where Wi-Fi and cellular communication is not available. DHS S&T will continue to identify and develop technology to enable sUAS operations in all operational environments.
- **Air Domain Awareness.** DHS S&T is partnering with CBP Air and Marine Operations to enable their mission to monitor the nation's airspace in support of border security, domestic aviation-related law enforcement and investigations, and other national objectives. This requires high quality, reliable, and comprehensive surveillance coverage, enabling the continuous monitoring, detection and tracking of suspect aircraft entering and within U.S. airspace, allowing for the rapid identification of airborne threats, and providing decision makers the maximum available amount of time to determine the optimal course of action.

To learn more about this topic, contact us at: sandt.bordersmaritime@hq.dhs.gov

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