



February 2017

BORDER SECURITY

Additional Actions Needed to Strengthen Collection of Unmanned Aerial Systems and Aerostats Data

GAO Highlights

Highlights of [GAO-17-152](#), a report to congressional requesters

Why GAO Did This Study

As the lead federal agency charged with securing U.S. borders, the Department of Homeland Security's (DHS) CBP has employed a variety of technologies and assets to assist with its border security efforts. In support of its mission, CBP operates a fleet of remotely piloted Predator B UAS and uses aerostats, including tactical aerostats and TARS. GAO was asked to review CBP's use of UAS and aerostats for border security.

This report addresses the following questions: (1) How does CBP use UAS and aerostats for border security activities, and to what extent has CBP developed and documented procedures for UAS coordination? and (2) To what extent has CBP taken actions to assess the effectiveness of its UAS and aerostats for border security activities? GAO reviewed CBP documents; analyzed Predator B UAS, tactical aerostat, and TARS data on use and effectiveness from fiscal years 2013 through 2016; interviewed field and headquarters officials; and conducted site visits to observe CBP's use of UAS and aerostats along U.S. borders.

What GAO Recommends

GAO is making five recommendations, including that CBP document coordination procedures for Predator B operations in all operating locations, update guidance and implement training for collection of Predator B mission data, and update Border Patrol's data collection practices for aerostat asset assists. CBP concurred and identified planned actions to address the recommendations.

View [GAO-17-152](#). For more information, contact Rebecca Gambler at (202) 512-8777 or gambler@gao.gov.

February 2017

BORDER SECURITY

Additional Actions Needed to Strengthen Collection of Unmanned Aerial Systems and Aerostats Data

What GAO Found

U.S. Customs and Border Protection (CBP) uses Predator B unmanned aerial systems (UAS) for a variety of border security activities but could benefit from documented coordination procedures in all operating locations. CBP uses its Predator B UAS to support a variety of efforts, such as missions to support investigations in collaboration with other government agencies (e.g., U.S. Immigration and Customs Enforcement) and to locate individuals illegally crossing the border. GAO found that CBP established various mechanisms to coordinate with other agencies for Predator B missions but did not develop and document coordination procedures in two of its three operational centers. Without documented coordination procedures in all operating locations consistent with internal control standards, CBP does not have reasonable assurance that practices in all operating locations align with existing policies and procedures for joint operations with other federal and non-federal government agencies.

CBP uses aerostats—unmanned buoyant craft tethered to the ground and equipped with video surveillance cameras and radar technology—to support its border security activities along the southern U.S. border. In south Texas, the U.S. Border Patrol (Border Patrol) uses relocatable tactical aerostats equipped with video surveillance technology to locate and support the interdiction of cross-border illegal activity. At eight fixed sites across the southern U.S. border and in Puerto Rico, CBP uses the Tethered Aerostat Radar System (TARS) program to support its efforts to detect occurrences of illegal aircraft and maritime vessel border incursions.

CBP has taken actions to assess the effectiveness of its UAS and aerostats for border security, but could improve its data collection. CBP collects a variety of data on its use of Predator B UAS, tactical aerostats, and TARS including data on their support for the apprehension of individuals, seizure of drugs, and other events (asset assists). For Predator B UAS, GAO found mission data—such as the names of supported agencies and asset assists for seizures of narcotics—was not recorded consistently across all operational centers, limiting CBP's ability to assess the effectiveness of the program. CBP has not updated its guidance for collecting and recording mission information in its data collection system to include new data elements added since 2014, and it does not have instructions for recording mission information such as asset assists. In addition, not all users of CBP's system have received training for recording mission information. Updating guidance and fully training users, consistent with internal control standards, would help CBP better ensure the quality of data it uses to assess effectiveness. For tactical aerostats, GAO found that Border Patrol collection of asset assist information for seizures and apprehensions does not distinguish between its tactical aerostats and TARS. Consistent with internal control standards, data that distinguishes between support provided by tactical aerostats and support provided by TARS would help CBP collect better and more complete information and guide resource allocation decisions, such as the re-deployment of tactical aerostat sites based on changes in cross-border illegal activity.

Contents

Letter		1
	Background	5
	CBP Uses UAS and Aerostats for a Variety of Border Security Activities, but Could Benefit from Documented Procedures for Coordinating Predator B Operations with Other Government Agencies	13
	CBP Has Taken Actions to Assess Effectiveness of Its UAS and Aerostats, but Could Improve Data Collection	25
	Conclusions	39
	Recommendations for Executive Action	40
	Agency Comments and Our Evaluation	40
Appendix I	U.S. Customs and Border Protection's (CBP) Recent Efforts to Implement a Small Unmanned Aerial System (UAS) Program	43
Appendix II	Objectives, Scope, and Methodology	45
Appendix III	Limitations Related to U.S. Customs and Border Protection's (CBP) Use of Predator B Unmanned Aerial Systems and Tactical Aerostats for Border Security	49
Appendix IV	Summary Statistics on the Reporting of Asset Assist Data for Apprehensions and Seizures for Aerostats, May 2014 through Fiscal Year 2016	51
Appendix V	Comments from the Department of Homeland Security	54
Appendix VI	GAO Contact and Staff Acknowledgments	59
Related GAO Products		60

Tables

Table 1: U.S. Customs and Border Protection Predator B Flight Hours by Mission Category, Fiscal Years 2013 through 2016	15
Table 2: Known Seizure and Apprehension Assists Attributed to U.S. Customs and Border Protection's Predator B Operations, Fiscal Years 2013 through 2016	27
Table 3: U.S. Customs and Border Protection Predator B Program Flight Hour Goals, Fiscal Years 2013 through 2016	28
Table 4: Detections Recorded Using Tactical Aerostat Video Surveillance Cameras by U.S. Border Patrol Sector, Fiscal Years 2014 through 2016	35
Table 5: Operational Availability of Tethered Aerostat Radar System (TARS) Program by Site, Fiscal Years 2013 through 2016	37
Table 6: Detections of Tracks of Interest (TOI) by Air and Marine Operations Center Using Tethered Aerostat Radar System (TARS), Fiscal Years 2013 through 2016	38
Table 7: Known Asset Assists Associated with Tracks of Interest (TOI) Identified by Air and Marine Operations Center Using Tethered Aerostat Radar System (TARS), Fiscal Years 2013 through 2016	39
Table 8: Number of Asset Assists for Apprehension and Seizure Events by U.S. Border Patrol Sectors and Stations Areas of Responsibility (AOR) Attributed to Aerostats, May 2014 through Fiscal Year 2016	51
Table 9: Number and Quantity of Seizure Events by U.S. Border Patrol Sectors and Stations Areas of Responsibility (AOR) Attributed to Aerostats, May 2014 through Fiscal Year 2016	53

Figures

Figure 1: Predator B Aircraft Sensors and General Areas of Responsibility for U.S. Customs and Border Protection's National Air Security Operation Centers for Launch and Recovery of Predator B Aircraft	7
Figure 2: U.S. Customs and Border Protection's (CBP) Predator B Flight Hours in Operational Certificates of Waiver or Authorization (COA) Airspace Encompassing Border and Coastal Areas, Fiscal Years 2011 through 2016	9

Figure 3: Location of U.S. Customs and Border Protection's Tactical Aerostat and Tethered Aerostat Radar System (TARS) Sites by U.S. Border Patrol Sector and Station Areas of Responsibility	10
Figure 4: U.S. Customs and Border Protection Rapid Aerostat Initial Deployment Aerostat	12
Figure 5: Example of U.S. Border Patrol's (Border Patrol) Use of Tactical Aerostats to Detect Cross-Border Illegal Activity	20
Figure 6: Identification of Suspected Border Incursions or Tracks of Interest by Detection Enforcement Officers at U.S. Customs and Border Protection's Air and Marine Operations Center	24

Abbreviations

AMO	Air and Marine Operations
AMOC	Air and Marine Operations Center
AMOSS	Air and Marine Operations Surveillance System
AOR	area of responsibility
Border Patrol	U.S. Border Patrol
CBP	U.S. Customs and Border Protection
COA	Certificate of Waiver or Authorization
DEO	Detection Enforcement Officer
DHS	Department of Homeland Security
EID	Enforcement Integrated Database
FAA	Federal Aviation Administration
NASOC	National Air Security Operations Center
RAPS	Robotic Aircraft for Public Safety
S&T	Science and Technology Directorate
TARS	Tethered Aerostat Radar System
TOI	track of interest
Trade Facilitation Act	Trade Facilitation and Trade Enforcement Act of 2015
UAS	unmanned aerial system
VADER	Vehicle and Dismount Exploitation Radar

This is a work of the U.S. government and is not subject to copyright protection in the United States. The published product may be reproduced and distributed in its entirety without further permission from GAO. However, because this work may contain copyrighted images or other material, permission from the copyright holder may be necessary if you wish to reproduce this material separately.



February 16, 2017

Congressional Requesters

U.S. Customs and Border Protection (CBP), within the Department of Homeland Security (DHS), is responsible for securing U.S. borders to prevent acts of terrorism and the unlawful movement of people, illegal drugs, and other contraband across U.S. borders.¹ Within CBP, the U.S. Border Patrol (Border Patrol) reported apprehending over 300,000 illegal entrants and seizing over 1 million pounds of marijuana and 10,000 pounds of cocaine in fiscal year 2015.² CBP is responsible for securing the U.S. border across nearly 4,000 miles with Canada and 2,000 miles with Mexico, and CBP law enforcement personnel are responsible for securing U.S. borders to prevent acts of terrorism and the unlawful movement of people, illegal drugs, and other contraband across U.S. borders. To help secure the border, CBP law enforcement personnel use a variety of technologies, which are critical to their ability to detect and identify the illegal entry of narcotics and people between ports of entry.³ For example, Border Patrol agents use, among other things, towers equipped with surveillance cameras and radar technology to detect the illegal entry of people between ports of entry. Along the south Texas border, Border Patrol also uses tactical aerostats, which are relocatable unmanned buoyant craft tethered to the ground equipped with video surveillance cameras.

In addition to surveillance technologies used by Border Patrol, CBP's Air and Marine Operations (AMO) uses its air and maritime assets both independently and as members of partnerships, task forces, and other whole-of-government networks, to help detect and identify illegal entrants and smugglers.⁴ AMO's fleet of air assets includes Predator B unmanned

¹See 6 U.S.C. § 211(a) (establishing CBP within DHS), (c) (enumerating CBP's duties).

²See id. § 211(e) (establishing and listing duties of U.S. Border Patrol within CBP).

³Ports of entry are facilities that provide for the controlled entry into or departure from the United States. Specifically, a port of entry is any officially designated location (seaport, airport, or land border location) where DHS officers or employees are assigned to clear passengers, merchandise, and other items; collect duties; and enforce customs laws; and where DHS officers inspect persons seeking to enter or depart, or applying for admission into, the United States, pursuant to U.S. immigration law.

⁴See 6 U.S.C. § 211(f) (establishing and listing duties of AMO within CBP).

aerial systems (UAS) equipped with video and radar surveillance technology to conduct border security efforts.⁵ AMO also operates the Tethered Aerostat Radar System (TARS) program which includes fixed site, aerostat-based radar systems that provide air surveillance across the southern U.S. border and in Puerto Rico. According to CBP's strategic plan, the use of technology in the border environment—including UAS, tactical aerostats, and TARS—better enables it to detect, identify, monitor, and appropriately respond to threats in the nation's border regions.⁶

You asked us to review CBP's use of UAS and aerostats, including Predator B UAS, TARS, tactical aerostats, and small UAS and its efforts to assess their effectiveness to secure the border.⁷ This report addresses the following questions: (1) How does CBP use UAS and aerostats for border security activities, and to what extent has CBP developed and documented procedures for UAS coordination? (2) To what extent has CBP taken actions to assess the effectiveness of its UAS and aerostats for border security activities?

To address both questions, we reviewed DHS and CBP documents related to UAS, aerostats, and surveillance technology for border security, including strategies, plans, reports, concepts of operation, and standard operating procedures. We also reviewed relevant laws, regulations, and past GAO work related to UAS, aerostats, and surveillance technologies used for border security activities. We conducted site visits to observe CBP's use of Predator B UAS and aerostats in Arizona, California, North Dakota, and Texas and interviewed CBP officials responsible for their

⁵CBP uses the term "unmanned aircraft systems" for these assets. A UAS is composed of a remotely piloted aircraft, a ground control station, a digital network, and other ground support equipment and personnel required to operate and maintain the system.

⁶U.S. Customs and Border Protection, *Vision and Strategy 2020: U.S. Customs and Border Protection Strategic Plan* (Apr. 8, 2015).

⁷The term "small UAS" is defined as a small unmanned aircraft weighing less than 55 pounds and its associated elements (including communication links and the components that control the small unmanned aircraft) that are required for the safe and efficient operation of the small unmanned aircraft in the national airspace system. See 14 C.F.R. § 107.3. As of November 2016, CBP is taking actions to implement a small UAS program to support its border security efforts. For more information about CBP's small UAS program, see appendix I.

operation.⁸ Findings from our observations and interviews cannot be generalized to all occurrences of CBP's use of Predator B UAS and aerostats, but provided insights into how these assets are used and contribute to border security operations along U.S. borders.

To determine how CBP uses Predator B UAS and aerostats, we reviewed and analyzed CBP information and data and met with responsible CBP officials. For Predator B UAS, we analyzed mission and flight hour data from fiscal years 2013 through 2016, the time period for which data were available in CBP's current system for recording Predator B mission data.⁹ We assessed the reliability of these data by examining data for any anomalies, reviewing CBP guidance and documents, and interviewing CBP officials to understand their methods for collecting, reporting, and validating the data. We found that data to be sufficiently reliable for the purposes of our report. We compared CBP's available documentation of its procedures for coordination of its use of Predator B UAS with *Standards for Internal Control in the Federal Government*.¹⁰ In addition, we reviewed provisions included in the Trade Facilitation and Trade Enforcement Act of 2015 (Trade Facilitation Act) requiring CBP, acting through AMO, to develop standard operating procedures to provide command, control, communication, surveillance, and reconnaissance assistance with UAS, including establishment of a process and procedure for the submission, approval, prioritization and coordination of air support

⁸For Predator B operations, we visited all operating locations that launch and recover Predator B aircraft. For tactical aerostats, we visited three of six total sites in south Texas and for TARS, we visited one site located in Fort Huachuca, Arizona and CBP's Air and Marine Operations Center in Riverside, California. We selected the tactical aerostat and TARS sites to visit based on their proximity to Predator B operating locations.

⁹AMO switched to a new system of record—Tasking, Operations, and Management Information System—to document Predator B mission data starting in fiscal year 2013 after retiring its use of the TECS (not an acronym) module Air and Marine Operations Reporting system. Predator B data provided by CBP were current as of September 12, 2016 for fiscal years 2013 through 2015 and November 1, 2016 for fiscal year 2016.

¹⁰GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999). Beginning in fiscal year 2016, [GAO/AIMD-00-21.3.1](#) is superseded by GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014). Because our audit work applied to fiscal years 2013 through 2016, this report refers to [GAO/AIMD-00-21.3.1](#).

requests from non-CBP law enforcement agencies.¹¹ For tactical aerostats and TARS, we reviewed CBP documents and information related to its use of TARS and tactical aerostats for border security activities.

To determine the extent to which CBP assesses the effectiveness of Predator B UAS and aerostats, we reviewed and analyzed CBP information; asset assist data for seizures, apprehensions, and other events; and met with responsible CBP program officials.¹² For Predator B UAS, we analyzed flight hour goal, asset assist, and launch rate data from fiscal years 2013 through 2016, the time period for which data were available in CBP's current system for recording Predator B mission data.¹³ For tactical aerostats, we reviewed operational availability data and analyzed asset assist data from May 2014 through fiscal year 2016, the most recent time period for which data were available in CBP data systems.¹⁴ For TARS, we reviewed operational availability and asset assist data from fiscal years 2013 through 2016, the time period starting when CBP assumed control of the program from the Department of Defense.¹⁵ To determine the reliability of Predator B, tactical aerostat, and TARS data, we examined data for any anomalies, reviewed CBP guidance and documents, and interviewed CBP officials to understand their methods for collecting, reporting, and validating the data. We found these data were sufficiently reliable for our reporting purposes of providing summary data on CBP's measures of effectiveness for Predator

¹¹See Homeland Security Act of 2002, Pub. L. No. 107-296, tit. IV, subtit. B, § 411, 116 Stat. 2135, 2178-79, as amended by Pub. L. No. 114-125, tit. VIII, subtit. A, § 802(a), 130 Stat. 122, 205-06 (2016) (classified, as amended, at 6 U.S.C. § 211(k)(1)(E)). The Trade Facilitation Act calls for the establishment of a process for other federal, state, and local law enforcement agencies to submit mission requests for UAS; a formal procedure to determine whether to approve or deny such a mission request; a formal procedure to determine how such mission requests are prioritized and coordinated; and a process regarding the protection and privacy of data and images collected by CBP through the use of UAS.

¹²Asset assists are instances in which a technological or nontechnological asset assisted in the apprehension of illegal entrants, seizure of drugs or other contraband, or other event.

¹³For the purposes of our report, Predator B aircraft launch rate is defined as the percentage of launched versus scheduled missions.

¹⁴For the purposes of our report, tactical aerostat operational availability is defined as percentage of time an aerostat is in flight providing surveillance data to CBP.

¹⁵For the purposes of our report, TARS operational availability is defined as percentage of time an aerostat is in flight providing surveillance data to CBP.

B UAS, tactical aerostat, and TARS across fiscal years 2013 through 2016, including launch rate, operational availability, and asset assists for seizures, apprehensions, and other events. We assessed CBP's data collection and management practices for Predator B UAS and tactical aerostats for mission information and asset assists against the management standards and practices contained in *Standards for Internal Control in the Federal Government*.¹⁶

We conducted this performance audit from November 2015 to February 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. See appendix II for more details on our objectives, scope, and methodology.

Background

CBP's Predator B UAS Program

CBP began operation of Predator B aircraft in fiscal year 2006, and as of fiscal year 2016, operates nine Predator B aircraft from four AMO National Air Security Operations Centers (NASOC) in Arizona, Florida, Texas, and North Dakota.¹⁷ Based on CBP data provided to us for fiscal year 2015, annual obligations for CBP's Predator B program were

¹⁶ [GAO/AIMD-00.21.3.1](#).

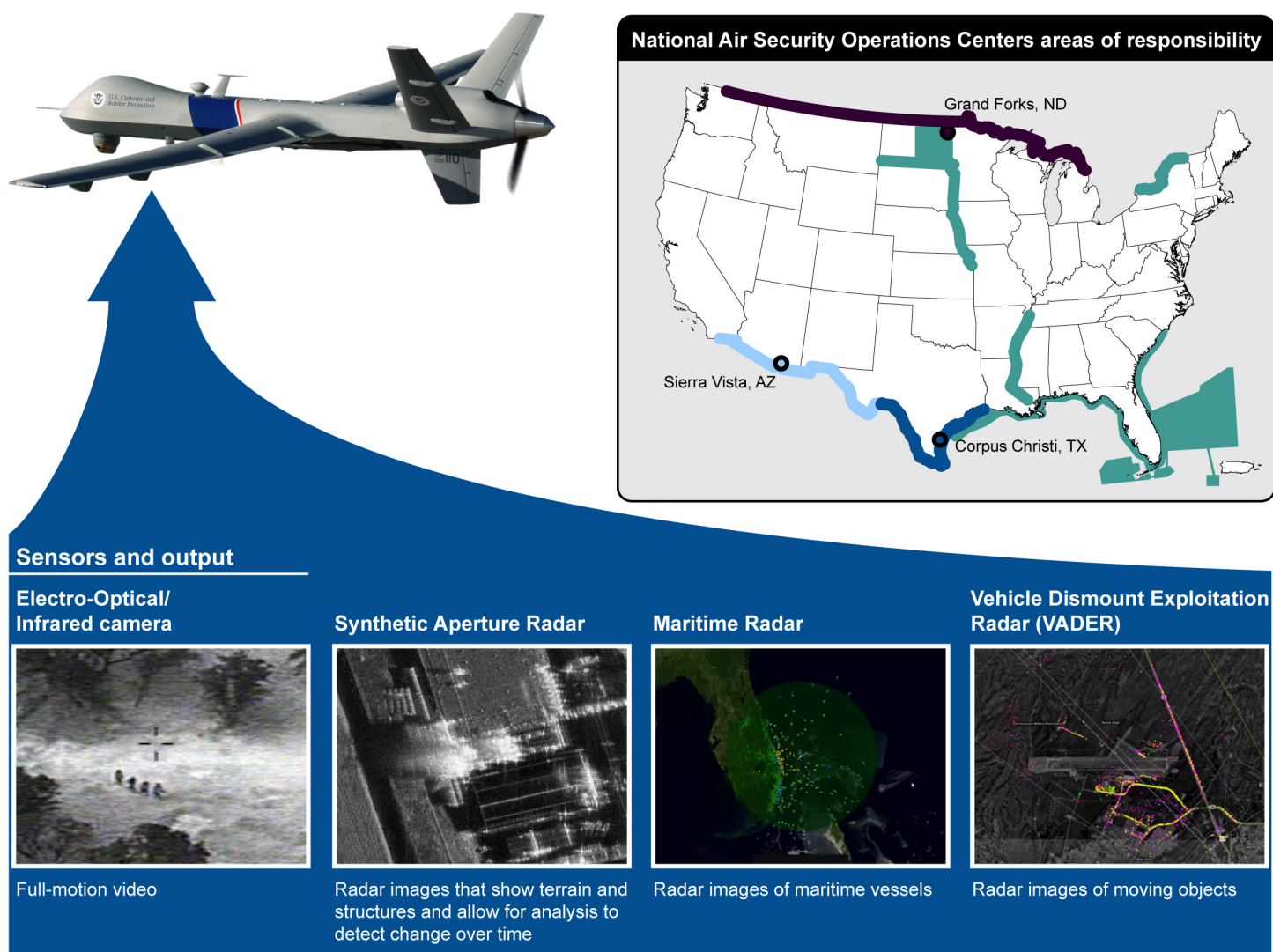
¹⁷ AMO's NASOCs perform specialized missions nationwide and in the Caribbean, eastern Pacific, and Central America, using Predator B UAS, long-range patrol aircraft, and other aircraft. From 2010 to 2013, AMO operated a NASOC in Cape Canaveral, Florida, for UAS operations.

approximately \$42 million and the cost per flight hour was \$5,878.¹⁸ AMO is responsible for operation of CBP's Predator B aircraft and coordinates with other CBP components and government agencies to perform federal border security activities.¹⁹ CBP's Predator B aircraft are equipped with video and radar sensors primarily to provide intelligence, surveillance, and reconnaissance capabilities. For more information on sensors equipped on Predator B aircraft, see figure 1. CBP's Predator B aircraft are launched and recovered at its NASOCs in Sierra Vista, Arizona; Corpus Christi, Texas; and Grand Forks, North Dakota; while the NASOC in Jacksonville, Florida remotely operates Predator B aircraft launched from other NASOCs. Each NASOC where Predator B aircraft are launched and recovered is generally assigned a broad geographic area of responsibility (AOR); see figure 1 for more information.

¹⁸An obligation is a definite commitment that creates a legal liability of an agency for the payment of goods or services received, or a legal duty on the part of the agency that could mature into a legal liability by virtue of actions of the other party beyond the control of the government. An agency incurs an obligation, for example, when it places an order, signs a contract, awards a grant, purchases services, or takes other actions that require the government to make payments to the public or from one government account to another. See GAO, *A Glossary of Terms Used in the Federal Budget Process*, [GAO-05-734SP](#) (Washington, D.C.: September 2005). Obligations and costs are presented in dollar amounts unadjusted for inflation. According to CBP officials, it developed its cost per flight hour based on Aviation Governance Board Bulletin 2015-001: DHS Standard Aviation Comparable Cost per Flight Hour Reporting Methodology (Sept. 28, 2015).

¹⁹According to CBP officials, AMO has operational control of CBP's Predator B aircraft, and during certain mission activities, tactical control may be under control of other CBP components and government agencies, such as Border Patrol. See Department of Homeland Security, *Aviation Concept of Operations Management Directive 0021* (Apr. 8, 2005). Operational control is defined as common authoritative direction involving the composition of subordinate forces, the assignment of tasks, and the designation of objectives necessary to accomplish the mission. Tactical control is subordinate to operational control and is used in the execution of operations and defined as the detailed and usually local direction and control of movement or maneuvers necessary to accomplish missions or tasks assigned. AMO also provides aerial support through CBP's Predator B aircraft to other government agencies upon request, such as U.S. Immigration and Customs Enforcement and the Federal Bureau of Investigation.

Figure 1: Predator B Aircraft Sensors and General Areas of Responsibility for U.S. Customs and Border Protection's National Air Security Operation Centers for Launch and Recovery of Predator B Aircraft



Source: GAO analysis of Department of Homeland Security information; U.S. Customs and Border Protection (data and photographs); Map Resources (map). | GAO-17-152

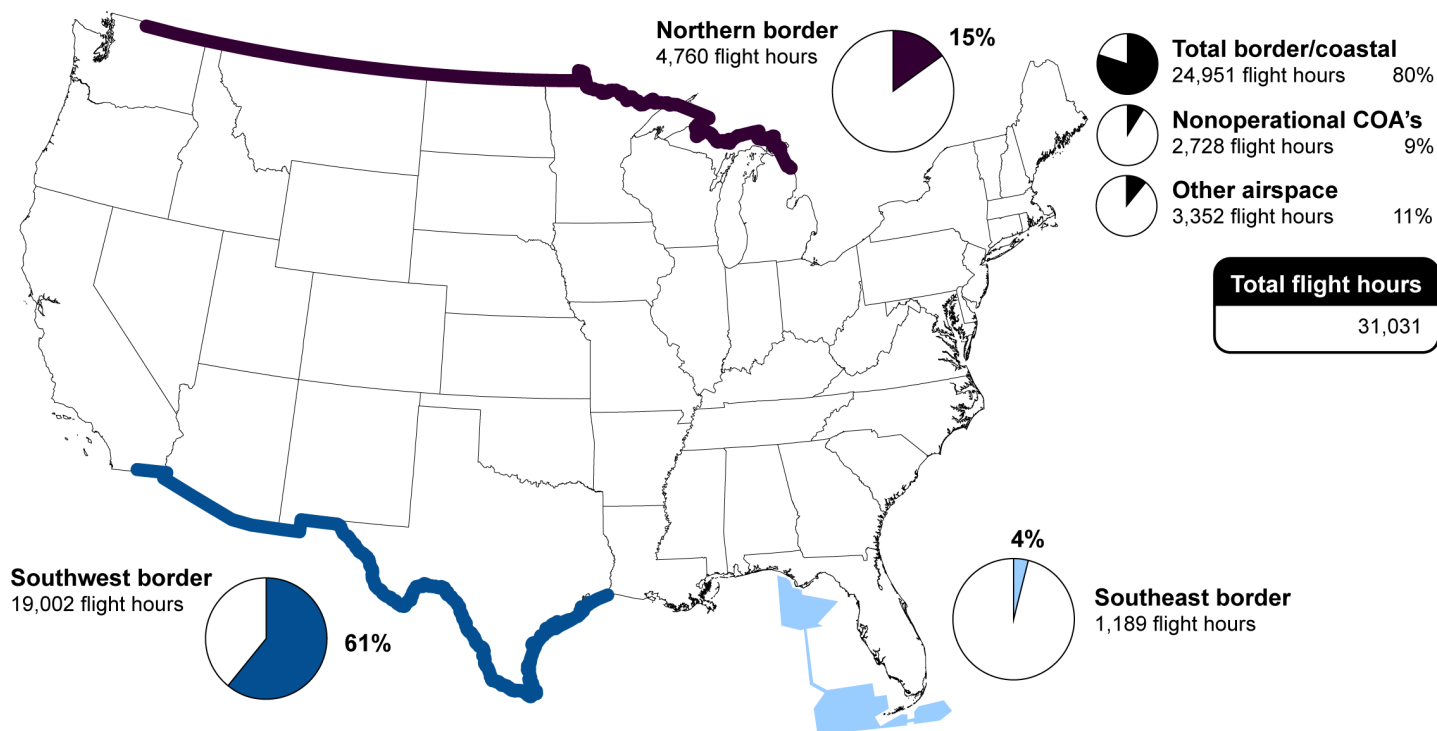
Note: National Air Security Operations Center areas of responsibility and other operating areas shown are approximate.

CBP is responsible for operating Predator B aircraft in accordance with Federal Aviation Administration (FAA) procedures for authorizing UAS

operations in the national airspace system.²⁰ Pursuant to FAA requirements, all Predator B flights must comply with procedures for obtaining Certificates of Waiver or Authorization (COA). The COA-designated airspace establishes operational corridors for Predator B activity both along and within 100 miles of the northern border, and along and within 25 to 60 miles of the southern border, exclusive of urban areas. COAs issued by FAA to CBP also include airspace for training missions which involve take offs and landings around a designated NASOC and transit missions to move Predator B aircraft between NASOCs. CBP reported 80 percent of Predator B aircraft flight hours were along border and coastal areas of the United States in COA-designated airspace (see fig. 2).

²⁰See Federal Aviation Administration, *Notice N JO 7210.891: Unmanned Aircraft Operations in the National Airspace System* (Nov. 25, 2015). The national airspace system is the network of United States airspace that includes the interconnected and interdependent network of systems, procedures, facilities, aircraft, and people.

Figure 2: U.S. Customs and Border Protection's (CBP) Predator B Flight Hours in Operational Certificates of Waiver or Authorization (COA) Airspace Encompassing Border and Coastal Areas, Fiscal Years 2011 through 2016



Source: GAO analysis of U.S Customs and Border Protection data; Map Resources (map). | GAO-17-152

Note: Operational COAs were associated with the southwest, southeast, and northern borders. Airspace locations shown above are approximate and reflect COA-designated operational airspace active as of fiscal year 2016. Nonoperational COAs include training, transit, and disaster COAs. According to CBP officials, COA flight hours reported may include flight hours in other airspace; for example, Predator B flight hours in restricted airspace during transition in and out of COA-designated airspace. Other airspace includes Predator B operations in restricted, foreign, and international airspace; for example, CBP operates Predator B aircraft to conduct long-range surveillance for joint counter-narcotics operations in the transit zone, the area from South America through the Caribbean Sea and the eastern Pacific Ocean that is used to transport illicit drugs to the United States. Flight hours shown in the figure are rounded to the nearest whole number.

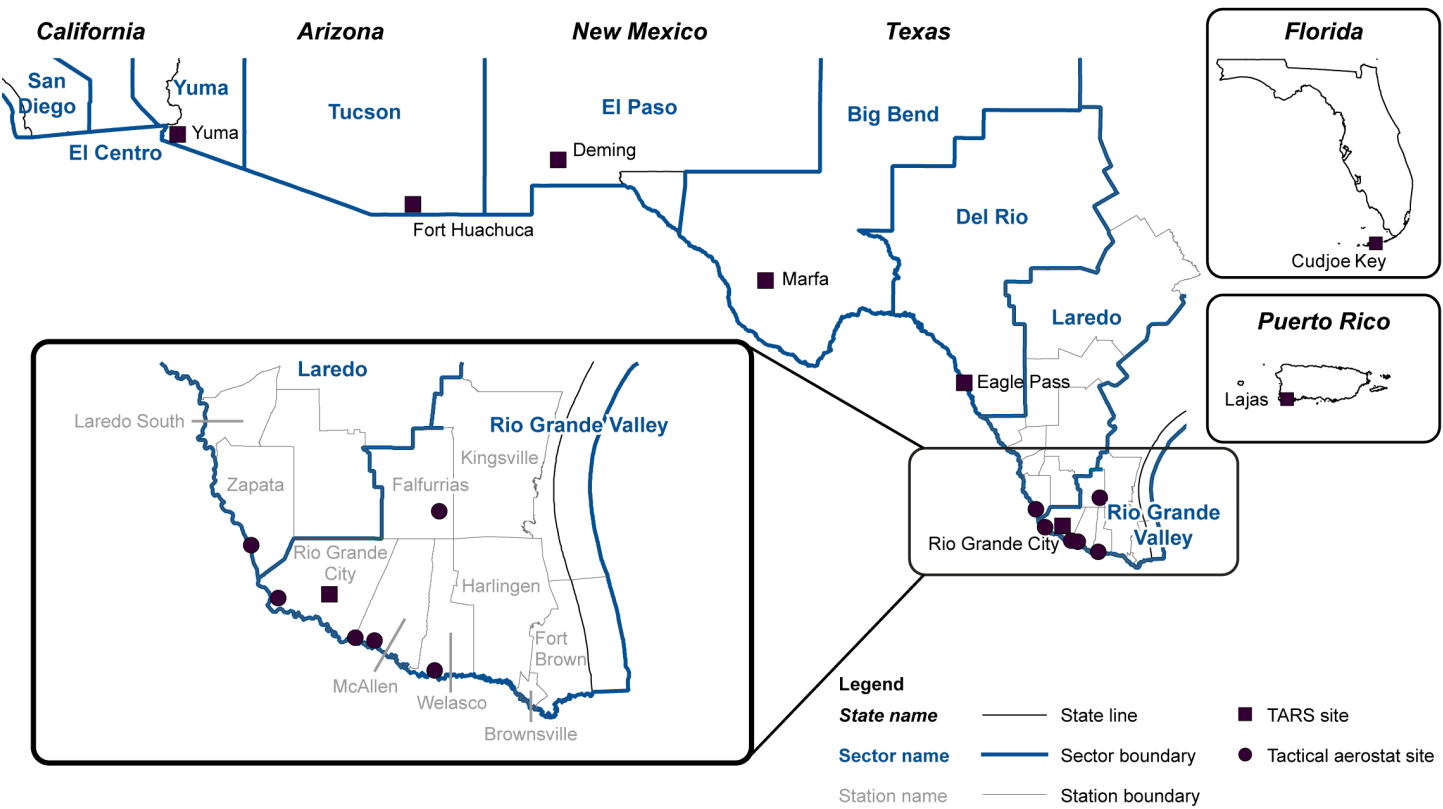
CBP's Tactical Aerostat Program

CBP began operation of tactical aerostats in August 2012 in south Texas. As of the end of fiscal year 2016, it had deployed five tactical aerostats in Border Patrol's Rio Grande Valley sector and one tactical aerostat in Laredo sector.²¹ For locations of CBP's tactical aerostats, see figure 3.

²¹Rio Grande Valley Border Patrol sector includes the following nine stations: Brownsville, Fort Brown, Weslaco, Harlingen, McAllen, Rio Grande City, Falfurrias, Kingsville, and Corpus Christi. Laredo Border Patrol sector includes the following eight stations: Laredo North, Laredo South, Zapata, Hebbronville, Cotulla, Freer, Dallas, and San Antonio. Each Border Patrol station is assigned a certain AOR within a Border Patrol sector.

Based on data CBP provided to us for fiscal year 2015, annual obligations for CBP’s tactical aerostat program were approximately \$41 million and the cost per flight hour ranged between \$424 to \$677, depending on the type of aerostat.²²

Figure 3: Location of U.S. Customs and Border Protection’s Tactical Aerostat and Tethered Aerostat Radar System (TARS) Sites by U.S. Border Patrol Sector and Station Areas of Responsibility



Source: U.S. Customs and Border Protection information; MapInfo (map). | GAO-17-152

Note: Tactical aerostat site locations shown are as of September 20, 2016.

²²Obligations and costs are presented in dollar amounts unadjusted for inflation. According to CBP officials, it developed its cost per flight hour based on Aviation Governance Board Bulletin 2015-001: DHS Standard Aviation Comparable Cost per Flight Hour Reporting Methodology (Sept. 28, 2015).

CBP currently operates three types of tactical aerostats equipped with video surveillance cameras that vary in size and altitude of operation.²³ CBP is responsible for operating its tactical aerostats in accordance with FAA regulations through the issuance of a COA authorizing use of moored balloons.²⁴ CBP's tactical aerostats were obtained through its Department of Defense ReUse program and are comprised of a mix of Department of Defense-loaned and CBP-owned equipment.²⁵ CBP manages the technology and operation of each tactical aerostat site through contracts, and Border Patrol agents operate tactical aerostat video surveillance cameras and provide security at each site. See figure 4 for a photograph of a CBP tactical aerostat.

²³CBP's tactical aerostats include the following three types: Rapid Aerostat Initial Deployment, Persistent Ground Surveillance System, and Persistent Threat Detection System.

²⁴See 14 C.F.R. pt.101. These rules govern operation in the United States of, among other things, any balloon that is moored to the surface of the earth or an object thereon and that has a diameter of more than 6 feet or a gas capacity of more than 115 cubic feet. See id. § 101.1(a)(1).

²⁵CBP's Department of Defense ReUse program is an initiative to identify excess Department of Defense technologies from the Southwest Asia retrograde operations after drawdowns from the wars in Iraq and Afghanistan for border security. CBP owns the Rapid Aerostat Initial Deployment aerostats and leases the Persistent Ground Surveillance Systems and Persistent Threat Detection Systems through the Department of Defense. Pursuant to the Illegal Immigration Reform and Immigrant Responsibility Act of 1996, the Secretary of Homeland Security is authorized to request, acquire and use, for detection, interdiction, and reduction of illegal immigration into the United States, any federal equipment available for transfer by any other federal agency. See Pub. L. No. 104-208, div. C, tit. I, subtit. A, § 103, 110 Stat. 3009, 3009-555 (classified at 8 U.S.C. § 1103 note).

Figure 4: U.S. Customs and Border Protection Rapid Aerostat Initial Deployment Aerostat



Source: GAO. | GAO-17-152

CBP's TARS Program

The former U.S. Customs Service began the TARS program in 1978 with the establishment of its first site located in Florida followed by a second site in Arizona in 1983. From 1988 to 1991, the U.S. Customs Service established additional TARS sites at Yuma, Arizona, and three sites in Texas, including Marfa, Eagle Pass and Rio Grande City. In 1992, management of the TARS program was transferred to the Department of Defense, with the U.S. Air Force designated as the executive agent. During the Department of Defense's management of the TARS program, sites were located in Florida, Texas, Arizona, Puerto Rico and the Bahamas.

In July 2013, the TARS program was transferred from the Department of Defense to DHS with a total of eight sites. At the time of transfer, two TARS sites were inoperable due to past system crashes and CBP restored operations at those sites in September 2014.²⁶ Based on data

²⁶CBP restored the TARS sites in Lajas, Puerto Rico and Marfa, Texas in May and September 2014, respectively.

CBP provided to us for fiscal year 2015, annual obligations for CBP's TARS program were approximately \$45 million and the cost per flight hour was about \$950.²⁷ CBP manages the technology and operation of each TARS site through contracts and CBP's Air and Marine Operations Center (AMOC) has operational control over each asset. As of fiscal year 2016, there were a total of eight TARS sites along the southern U.S. border and in Puerto Rico.²⁸ For a map of TARS sites, see figure 3 above.

CBP Uses UAS and Aerostats for a Variety of Border Security Activities, but Could Benefit from Documented Procedures for Coordinating Predator B Operations with Other Government Agencies

²⁷ Obligations and costs are presented in dollar amounts unadjusted for inflation. According to CBP officials, it developed its cost per flight hour based on Aviation Governance Board Bulletin 2015-001: DHS Standard Aviation Comparable Cost per Flight Hour Reporting Methodology (Sept. 28, 2015). According to CBP, annual maintenance costs for the TARS program from fiscal years 2013 through 2016 ranged between \$15.0 to \$16.5 million with an average cost of \$2.0 million per site.

²⁸ According to CBP officials, no equipment or system upgrades were completed prior to or after the transfer of the TARS program from the Department of Defense to DHS.

CBP Uses Predator B UAS to Support a Variety of Activities and Government Agencies, but Could Benefit from Documenting Coordination Procedures

CBP uses Predator B aircraft to conduct various border security activities and to support a range of government agencies. First, with regard to the types of activities for which Predator B aircraft are used, our analysis of CBP data showed that over 80 percent of Predator B missions were in support of law enforcement and extended border missions, as shown in table 1. In particular, about 67 percent of missions were for law enforcement activities, such as use of Predator B aircraft to locate individuals illegally crossing the border and provide aerial surveillance during investigations in joint operations with federal law enforcement agencies and during special security events like Pope Francis's visit to Juarez, Mexico, in February 2016. About 16 percent of missions were in support of extended border operations, which are operations beyond U.S. territorial lands and seas in support of federal and international law enforcement partnerships.²⁹ For example, CBP uses its Predator B aircraft for interdiction operations with Joint Interagency Task Force – South, including maritime patrol missions in the source and transit zones, which encompass the area from South America through the Caribbean Sea and the eastern Pacific Ocean that is used to transport illicit drugs to the United States (transit zone) from drug producing countries in South America (source zone).³⁰ In addition, about 14 percent of missions were for training, and about 1 percent was for non-enforcement activities, such as for natural disaster recovery efforts.³¹

²⁹According to CBP officials, no Predator B operations have been conducted in Canadian airspace.

³⁰Our analysis of CBP data showed that 8 percent of Predator B flight hours were completed during extended border missions in foreign airspace from fiscal years 2013 through 2016 to support Joint Interagency Task Force – South counter-narcotics operations; specifically: 1,219 flight hours in El Salvador, 128 flight hours in the Dominican Republic, and 319 flight hours in Colombia. CBP also uses Predator B aircraft to perform bi-national law enforcement operations with the government of Mexico through coordination at the Information Analysis Center located at the U.S. Embassy in Mexico City, Mexico. We found that 7 percent of Predator B flight hours from fiscal years 2013 through 2016 were in foreign airspace located in Mexico or 1,615 flight hours.

³¹Predator B training missions primarily involve take offs and landings around a designated NASOC for the purposes of a UAS pilot maintaining FAA certification. CBP has used the NASOC in North Dakota as a location to train new and existing CBP Predator B pilots and we found 60 percent of Predator B flight hours attributed to that NASOC were training missions from fiscal years 2013 through 2016. CBP has used Predator B aircraft in preparation for and response to natural disasters, such as wildfires and floods. For example, CBP used radar on its Predator B aircraft to surveil areas affected by flooding along the Mississippi River in January 2016. Other non-enforcement activities include transit missions to move Predator B aircraft between operating locations.

Table 1: U.S. Customs and Border Protection Predator B Flight Hours by Mission Category, Fiscal Years 2013 through 2016

Flight Hours

Fiscal year	Mission Category					Total
	Law enforcement	Extended border ^a	Training ^b	Maintenance ^c	Non-enforcement ^d	
2013	4,040	247	717	74	32	5,110
2014	2,964	519	1,027	84	21	4,615
2015	2,927	1,817	688	60	23	5,515
2016	4,013	698	563	85	181	5,540
Total	13,944	3,281	2,995	303	257	20,780
Percent of Total	67.1	15.8	14.4	1.5	1.2	100

Source: GAO analysis of U.S. Customs and Border Protection (CBP) data. | GAO-17-152

^aExtended border missions include patrol missions in the transit zone—the area from South America through the Caribbean Sea and the eastern Pacific Ocean that is used to transport illicit drugs to the United States.

^bTraining missions primarily involve take offs and landings around a designated National Air Security Operations Center for the purposes of an unmanned aerial system pilot maintaining Federal Aviation Administration certification to operate Predator B aircraft.

^cMaintenance missions include Predator B aircraft launched and recovered during routine aircraft maintenance, such as an assessment of aircraft operational function.

^dNon-enforcement missions include federal disaster relief and relocation of Predator B aircraft between CBP's three operating locations.

With regard to CBP's use of Predator B aircraft in support of government agencies, based on our analysis of CBP data, we found that half of all Predator B flight hours from fiscal years 2013 through 2016 (51 percent) were in support of Border Patrol to help, among other things, in its efforts to detect the illegal entry of goods and people between U.S. ports of entry.³² We also found that 32 percent of Predator B flight hours from fiscal years 2013 through 2016 were in support of AMO, such as for missions to train AMO UAS pilots. CBP's Predator B operations in support of other federal agencies accounted for 15 percent of Predator B flight hours from fiscal years 2013 through 2016, such as conducting aerial surveillance for investigations during controlled deliveries of illegal contraband by U.S. Immigration and Customs Enforcement. We found that 2 percent of Predator B flight hours from fiscal years 2013 through 2016 were attributed to support for state and local government agencies. For example, CBP's Predator B operations in support of local law

³²For the purposes of this report, we generally refer to government agencies associated with Predator B missions as supported agencies, which includes independent missions, partnerships, tasks forces, and joint operations. CBP's Predator B aircraft are used to provide aerial support to other government agencies through mission support requests submitted to AMO.

enforcement agencies have included performing aerial surveillance during officer safety incidents, such as an active shooting incident.

As part of using Predator B aircraft to support other government agencies, CBP has established various mechanisms to coordinate Predator B operations. For example, at NASOCs, personnel from other CBP components are assigned to support and coordinate mission activities involving Predator B operations. Border Patrol agents assigned to support NASOCs assist with directing agents and resources to support its law enforcement operations and collecting information on asset assists provided for by Predator B operations. Further, two of DHS's joint task forces help coordinate Predator B operations.³³ Specifically, Joint Task Force – West, Arizona and Joint Task Force – West, South Texas³⁴ coordinate air asset tasking and operations, including Predator B operations and assist in the transmission of requests for Predator B support and communication with local field units during operations, such as Border Patrol stations and AMO air branches. Further, CBP uses a dedicated system—called BigPipe—to coordinate Predator B operations. BigPipe distributes operational mission data to supported federal, state, and local law enforcement agencies. In particular, BigPipe distributes real-time and recorded mission information, including information from sensors on AMO assets, including Predator B aircraft. According to CBP officials, BigPipe allows for seamless and efficient secure communication between AMO, Joint Task Force – West, Arizona, and other locations.

In addition to these mechanisms, CBP has also documented procedures for coordinating Predator B operations among its supported or partner agencies in Arizona specifically by developing a standard operating procedure for coordination of Predator B operations through its NASOC in Arizona. These documented procedures include a description of the responsibilities of participating agencies; procedures for sharing mission

³³The Secretary of Homeland Security initiated the Southern Border and Approaches Campaign Plan in November 2014 to address the region's border security challenges, by commissioning three joint task forces, two of which are geographically based, Joint Task Force – East, Joint Task Force – West, and one which is functionally based, Joint Task Force – Investigations. The Joint Task Forces attained initial and full operational capability in 2015. Joint Task Force – West is separated into geographic command corridors with CBP as the lead agency responsible for overseeing border security efforts to include: California, Arizona, New Mexico/West Texas, and South Texas.

³⁴Joint Task Force – West, Arizona's AOR includes Tucson and Yuma Border Patrol sectors. Joint Task Force – West, South Texas's AOR includes Rio Grande Valley, Laredo, and Del Rio Border Patrol sectors.

information and collecting asset assist information from supported agencies related to seizures and apprehensions; and requirements for reviewing and tasking of air support requests for Predator B aircraft from non-CBP government agencies. Joint Task Force – West, Arizona also created an air integration strategy outlining the surveillance assets and associated capabilities available to support operations in its AOR, including a model to guide use of air and ground assets, including Predator B aircraft and towers equipped with video and radar surveillance technology. According to CBP officials we met with in Arizona, the integration strategy, in conjunction with information on surveillance technology deployment, were used to help plan and prioritize Predator B patrol missions in areas lacking existing surveillance technology; for example, along federal and tribal lands in Tucson Border Patrol sector's AOR.

However, CBP has not documented procedures for coordination of Predator B operations among its supported agencies through its NASOCs in Texas and North Dakota. CBP has established national policies for its Predator B operations that include policies for prioritization of Predator B missions and processes for submission and review of Predator B mission or air support requests.³⁵ However, these national policies do not include coordination procedures specific to Predator B operating locations or NASOCs, such as local tasking of air support requests to Predator B versus other aircraft, procedures for sharing mission information across multiple locations and agencies, and collection and reporting of asset assist information from supported agencies during and after Predator B missions. For example in Texas, Predator B operations are coordinated in part through DHS's Joint Task Force – West, South Texas and air support requests for Predator B aircraft may be submitted by government agencies to the NASOC in Texas. Without documented coordination

³⁵See Air and Marine Operations, *Unmanned Aircraft Systems Mission Prioritization for National Air Security Operations Intelligence, Surveillance, and Reconnaissance Aviation Support*, Procedure 2014-07 (July 31, 2014) and Air and Marine Operations, *National Air Security Operations National Command Duty Officer*, Procedure 2014-12 (July 31, 2014). CBP developed three tiers in order of priority for Predator B operations: Tier 1—nationally directed DHS or CBP missions, including response to a terrorist attack or international natural disaster. Tier 2—-independent missions and joint operations with CBP components, such as Border Patrol and Office of Intelligence. Tier 3—missions in response to requests from other federal, state, and local government agencies. In addition to these tiers, CBP also developed an ordered list of mission priorities, including top prioritization for missions related to law enforcement officers and other persons in need of assistance in life-threatening situations, followed by investigative and routine mission support, and maintenance test flights were assigned the least priority.

procedures for Predator B operations in Texas, it is not clear how requests submitted to the NASOC in Texas are reviewed, prioritized, and coordinated with Joint Task Force – West, South Texas, including how both entities reach agreement on requests that may involve competing priorities.

Standards for Internal Control in the Federal Government states that significant events should appear in management directives, policies, or operating manuals to help ensure management's directives are carried out as intended.³⁶ The Trade Facilitation Act also requires that, as part of standard operating procedures regarding use of UAS, AMO is to develop a formal procedure to determine how UAS mission requests from non-CBP law enforcement agencies are prioritized and coordinated.³⁷ Further, CBP's strategic plan states that integrating surveillance capabilities into the planning and execution of law enforcement operations is enabled by sound standards, procedures, and processes that require interagency coordination. CBP's Predator B aircraft are national assets used primarily for detection and surveillance during law enforcement operations, independently and in coordination with federal, state, and local law enforcement agencies throughout the United States. AMO officials acknowledged that developing documented coordination procedures for Predator B operations in North Dakota and Texas could strengthen ongoing coordination efforts; however, CBP has not yet taken actions to develop documented coordination procedures in those operating locations due to differences across those locations. For example, AMO officials told us that the current coordination process in Texas, which relies on direct operator to operator coordination, may be inefficient at times. Further, AMO officials stated that a coordination process through Joint Task Force – West, South Texas is under development and that

³⁶ [GAO/AIMD-00-21.3.1](#). See also [GAO-14-704G](#): *Standards for Internal Control* calls for management to design control activities, such as clearly documenting internal control and all transactions and other significant events in a manner that allows the documentation to be readily available for examination. The documentation may appear in management directives, administrative policies, or operating manuals, in either paper or electronic form. Documentation and records are to be properly managed and maintained.

³⁷ See Pub. L. No. 107-296, tit. IV, subtit. B, § 411, 116 Stat. at 2178-79, as amended by Pub. L. No. 114-125, tit. VIII, subtit. A, § 802(a), 130 Stat. at 205-06 (classified, as amended, at 6 U.S.C. § 211(k)(1)(E)). The Trade Facilitation Act calls for the establishment of a process for non-CBP federal, state, and local law enforcement agencies to submit mission requests for UAS; a formal procedure to determine whether to approve or deny such a mission request; a formal procedure to determine how such mission requests are prioritized and coordinated; and a process regarding the protection and privacy of data and images collected by CBP through the use of UAS.

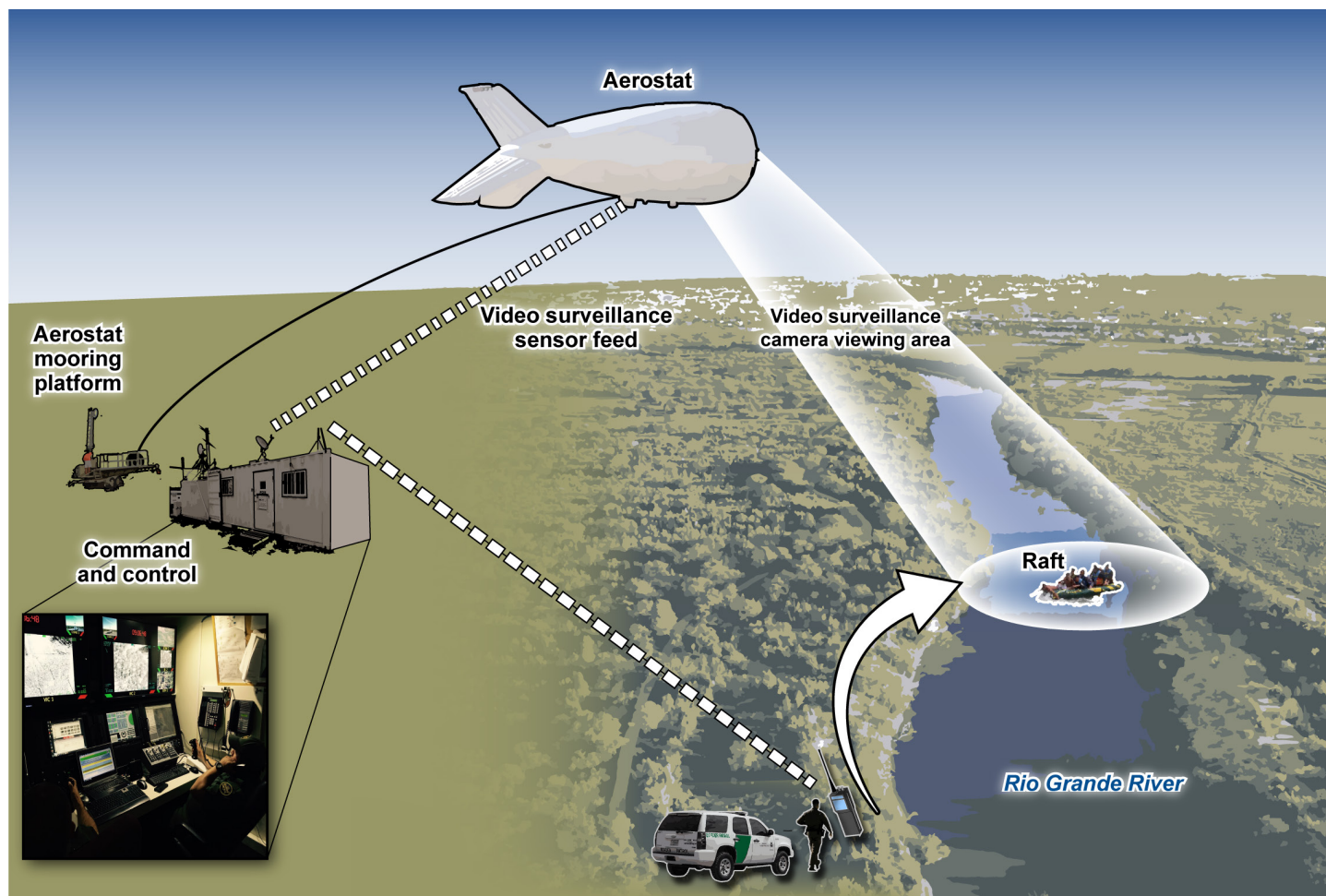
documented coordination procedures for Predator B operations could strengthen CBP's coordination with other government agencies. Without documenting its procedures for coordination of Predator B operations with supported agencies, CBP does not have reasonable assurance that practices at NASOCs in Texas and North Dakota align with existing policies and procedures for joint operations with other government agencies.

CBP Uses Tactical Aerostats to Detect Cross-Border Illegal Activity in South Texas

Within CBP, Border Patrol uses tactical aerostats to identify cross-border illegal activity through video surveillance cameras attached to an aerostat during flight, and these aerostats are deployed in south Texas. Border Patrol agents operate video surveillance cameras on tactical aerostats in flight from a local command and control center to detect, identify, monitor, and track items of interest. For example, Border Patrol agents can position video surveillance cameras to observe an item of interest such as a person attempting to illegally enter the United States from Mexico by crossing the Rio Grande River using a raft. Once an item of interest has been identified, a Border Patrol agent operating a video surveillance camera can relay information to other agents through direct land-mobile radio communication or through a Border Patrol station Tactical Operations Center.³⁸ For an example of Border Patrol's use of tactical aerostat technology, see figure 5.

³⁸A Border Patrol station Tactical Operations Center is the principal field unit command and control element responsible for monitoring activity within its designated AOR. Border Patrol agents assigned to Tactical Operations Centers also monitor agent communication and available surveillance technologies to request and deploy assets and other agents for enforcement activities.

Figure 5: Example of U.S. Border Patrol's (Border Patrol) Use of Tactical Aerostats to Detect Cross-Border Illegal Activity



Source: GAO analysis of U.S. Customs and Border Protection (CBP) information; CBP (photos). | GAO-17-152

Note: Border Patrol agents located in a tactical aerostat site command and control center position the tactical aerostat video surveillance camera to locate cross-border illegal activity along the Rio Grande River. Once activity is detected, Border Patrol agents in the command and control center relay information to other agents for further investigation and interdiction.

In its Aerostat Operational Need Statement, Border Patrol's Rio Grande Valley sector stated that video surveillance cameras on tactical aerostats in flight can be used to detect items of interest across wide coverage areas.³⁹ The Operational Need Statement further stated that video

³⁹U.S. Border Patrol, *Rio Grande Valley Sector Fiscal Year 2015 Aerostat Operational Need Statement* (July 14, 2014).

surveillance cameras on tactical aerostats in flight can enhance surveillance coverage by increasing the elevation and viewing angle to overcome obstructions from vegetation and bends in the Rio Grande River, which limit the use of tower-mounted camera systems. Further, CBP reported that video surveillance cameras on tactical aerostats can view items of interest from a distance between 10 to 24 kilometers based on the type aerostat and altitude of operation.

Border Patrol agents also use tactical aerostats in south Texas to support bi-national law enforcement efforts between Border Patrol and the government of Mexico. Border Patrol officials we met with in south Texas told us that information from video surveillance cameras on tactical aerostats shared with the government of Mexico has resulted in seizures of weapons and narcotics. For example in fiscal years 2014 through 2016, Border Patrol reported over 60,000 pounds of known marijuana seized by the government of Mexico through assistance provided by tactical aerostats.

Border Patrol agents use other surveillance technologies to aid in identifying items of interest with tactical aerostat video surveillance cameras. For example, Border Patrol agents may use tactical aerostat and relocatable tower video surveillance cameras concurrently within tactical aerostat command and control centers.⁴⁰ According to CBP officials, video surveillance cameras on these towers help to enhance the coverage area and provide continued coverage when aerostats are not in flight. Border Patrol agents assigned to tactical aerostat sites are also able to access information from unattended sensors, which can provide cueing information to locate items of interest with tactical aerostat video surveillance cameras.

Border Patrol plans to use tactical aerostats until Remote Video Surveillance System technology is deployed in Rio Grande Valley and Laredo Border Patrol sectors, but is too soon to tell when such technology will be deployed.⁴¹ According to CBP officials, as of fiscal year 2016, there are no plans to deploy any additional tactical aerostats. In April 2016, DHS approved deployment of Remote Video Surveillance System technology in two Border Patrol station AORs in Rio Grande Valley

⁴⁰CBP obtained its relocatable towers through its Department of Defense ReUse program.

⁴¹A Remote Video Surveillance System is a system of towers with cameras that transmit information to video monitors at a Border Patrol facility.

sector. Specifically, CBP plans to deploy 18 Remote Video Surveillance System technology sites in Rio Grande City and 12 in McAllen stations' AORs. According to CBP officials, as of November 2016, CBP had chosen its sites for Remote Video Surveillance System technology deployment in the two AORs and initiated survey studies to plan activities for its chosen sites. CBP has not finalized plans for deployment of Remote Video Surveillance System technology in other areas of Rio Grande Valley or Laredo Border Patrol sectors.

CBP Uses TARS to Support Domain Awareness along the Southern Border

CBP uses TARS to provide domain awareness along U.S. southern borders.⁴² TARS captures continuous radar information and detects moving objects passing through its radar coverage area that can include lawful and unlawful aircraft, vessels, or vehicles entering or approaching the United States. TARS provides radar coverage from an altitude of operation up to 15,000 feet and can detect objects within 200 nautical miles. The elevated radar sensor on the TARS aerostat mitigates curvature of the earth and terrain masking limitations of common ground based radar systems. According to CBP data provided to us for 2015, the eight TARS sites collectively detected approximately 4.73 billion moving objects such as aircraft and vessels. Data captured from TARS are disseminated to AMOC. Two TARS sites in Florida and Puerto Rico provide constant radar surveillance of vessel traffic to enable maritime domain awareness. One TARS site in Eagle Pass, Texas is also equipped with a video surveillance camera to assist Border Patrol Del Rio sector's efforts to detect cross-border illegal activity in its Eagle Pass South Border Patrol station's AOR.⁴³

Information from TARS is primarily used by CBP detection enforcement officers (DEO) at AMOC in combination with other information to detect and identify tracks of interest (TOI) or potential occurrences of illegal air,

⁴²Domain awareness is the observation of the operating domain (air, land, and maritime) and the baseline information associated with the domain. Increasing domain awareness increases the probability of increased situational awareness—the understanding of an event occurring or about to occur within a domain that could affect security, safety, the economy, or the environment.

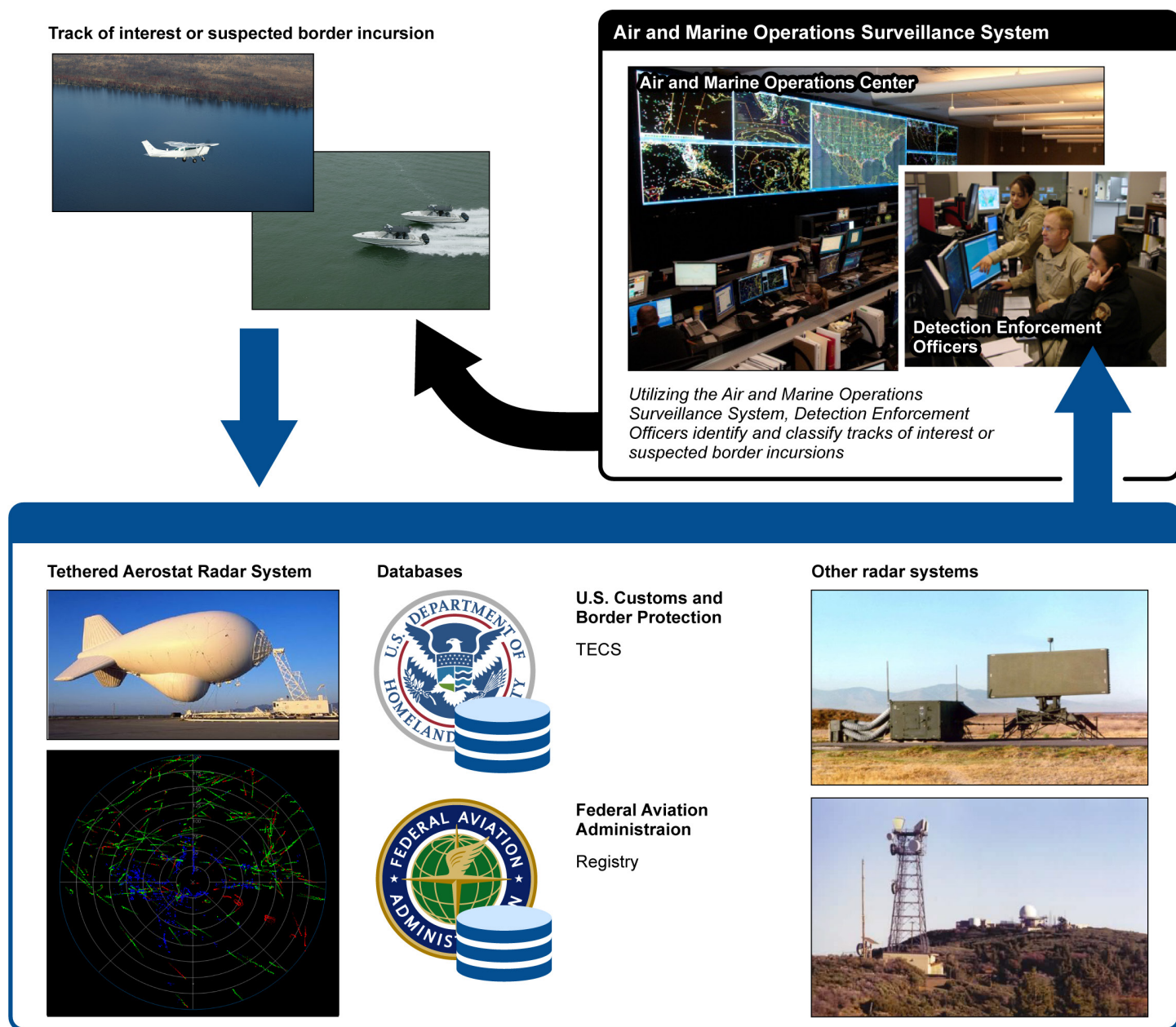
⁴³According to Border Patrol officials, the TARS in Eagle Pass, Texas was equipped with a video surveillance camera in September 2012 through an agreement with the U.S. Air Force. According to CBP officials, it is currently planning to add video surveillance cameras to additional aerostats at TARS sites to support Border Patrol.

land, and maritime border incursions (see fig. 6 below).⁴⁴ Specifically, radar information captured across all TARS sites is integrated through AMOC's operational system—the Air and Marine Operations Surveillance System (AMOSS).⁴⁵ AMOSS provides a single display showing multiple real-time radar images, including from TARS and FAA and Department of Defense radar systems, as a single fused output or track. AMOSS provides users with information from government databases, such as FAA databases for aircraft registration and flight plan information. CBP's law enforcement databases are also integrated with AMOSS to provide users with enforcement and case-related information. AMOSS automatically populates information from other government databases which is available in real-time along with a single radar image including information from multiple radar systems and TARS. According to CBP officials, the ability of DEOs to detect border incursions through AMOSS is significantly diminished when a TARS site is not operational since there are limited radar systems near TARS sites and none that can provide similar radar coverage.

⁴⁴Using radar information from TARS sites through the Air and Marine Operations Surveillance System, DEOs identify aircraft, vessels, or vehicles illegally entering the United States or involved in the shipment or carrying of narcotics, illegal contraband, aliens and currency; terrorist activities; or other suspected or confirmed violations of U.S. customs or immigration law. DEOs at AMOC coordinate with federal, state, local, and international law enforcement agencies to detect, identify, track and coordinate interdiction of suspect aviation and maritime activity in the approaches to U.S. borders, at the borders, and within the interior of the United States.

⁴⁵According to CBP officials, DEOs only use radar information from TARS sites in AMOSS.

Figure 6: Identification of Suspected Border Incursions or Tracks of Interest by Detection Enforcement Officers at U.S. Customs and Border Protection's Air and Marine Operations Center



Source: GAO analysis of U.S. Customs and Border Protection (CBP) information; CBP (photos). | GAO-17-152

As of November 2016, CBP has a study underway to evaluate future use of TARS. As we reported in May 2016, CBP is conducting an analysis of alternatives for the TARS program to inform future decisions related to the legacy program.⁴⁶ According to CBP, TARS are obsolete and no longer manufactured or supported and could be out of service by early 2020. CBP officials told us TARS sites face immediate risks of being out of service earlier than 2020 should a crash occur at a TARS site rendering the radar components inoperable because there are no spare radar systems available. CBP has no specific plans for replacement or modernization of TARS, but is currently undergoing an analysis of alternatives to determine whether the agency should modernize or replace them. According to CBP officials, the analysis of alternatives for TARS is expected to be completed during fiscal year 2017. The purpose of the analysis of alternatives is to identify the most appropriate capability that CBP should consider to fill the impending gap in persistent surveillance of the air domain provided by the eight current TARS sites.

CBP Has Taken Actions to Assess Effectiveness of Its UAS and Aerostats, but Could Improve Data Collection

CBP Has Studied and Collects Various Data to Assess the Effectiveness of Its Predator B Program, but Could Strengthen Its Efforts through More Consistent Data Collection

CBP has initiated various studies and evaluations to help assess the effectiveness of its Predator B program, and also collects and tracks various data related to Predator B operations. With regard to studies and evaluations, in October 2015 AMO initiated a capability gap assessment process to evaluate how specific AMO platforms, including Predator B aircraft, contribute to its border security mission. Further, in 2015 AMO also initiated a study to analyze the contributions of its assets and identify metrics for domain awareness along the southwestern U.S. border. AMO's objectives for this study include (1) defining domain awareness as it pertains to border security; (2) characterizing and measuring AMO

⁴⁶GAO, *Information Technology: Federal Agencies Need to Address Aging Legacy Systems*, [GAO-16-468](#) (Washington, D.C.: May 25, 2016).

operations in terms of their contributions to domain awareness; and (3) developing candidate metrics for domain awareness. In June 2016, as part of this study, AMO released a report including analysis of Predator B aircraft Vehicle and Dismount Exploitation Radar (VADER)—a radar system which collects radar images of moving objects—use along the U.S.-Mexico border in Arizona and proposed performance metrics for missions involving domain and situational awareness. AMO officials told us it plans to analyze VADER use along the U.S.-Mexico border in Texas as part of this study starting in fiscal year 2017.

In addition, in August 2015 DHS's Science and Technology Directorate (S&T) initiated a study of CBP's Predator B program through DHS's Joint Requirements Council in partnership with AMO.⁴⁷ The purpose of this study is to (1) identify a recommended number of Predator B aircraft assigned to operating locations or NASOCs and (2) determine whether expanding the use of Predator B aircraft is the best use of funds for border security. The study was initiated in response to the findings of a 2014 DHS Office of Inspector General report on CBP's Predator B program and following a January 2015 Acquisition Decision Memorandum that called for CBP to provide the Joint Requirements Council with justification for the number of Predator B aircraft and their assignment to operating locations.⁴⁸

In September 2016, DHS released a report based on the S&T-led study that recommended CBP not expand its Predator B program beyond its current nine aircraft based on challenges identified in the report.⁴⁹ Challenges identified in DHS's report included, for example, the availability of UAS pilots and staff to operate, maintain, and repair Predator B aircraft. According to CBP officials, the agency plans to

⁴⁷DHS established the Joint Requirements Council to review and validate requirements across the department's components, including CBP's requirements for domain awareness. For more information on DHS's Joint Requirements Council, see: GAO, *Homeland Security Acquisitions: Joint Requirements Council's Initial Approach is Generally Sound and It Is Developing a Process to Inform Investment Priorities*, [GAO-17-171](#) (Washington, D.C.: Oct. 24, 2016).

⁴⁸Department of Homeland Security, Office of Inspector General, *U.S. Customs and Border Protection's Unmanned Aircraft System Program Does Not Achieve Intended Results or Recognize All Costs of Operations*, OIG-15-17 (Washington, D.C.: Dec. 24, 2014).

⁴⁹Department of Homeland Security, *Acquisition Decision Memorandum Response for the MQ-9 Unmanned Aircraft System* (Sept. 29, 2016). DHS also uses the term MQ-9 to refer to Predator B aircraft.

resolve the challenges identified by the S&T-led study and maintain the nine aircraft already in its Predator B program.

With regard to data on Predator B operations, CBP collects and tracks data that can help it monitor operational effectiveness, including (1) asset assists, (2) detections of cross-border illegal activity, (3) the launch rate of Predator B aircraft (i.e., the percentage of launched versus scheduled missions), and (4) annual flight hour goals.

- **Asset assists.** CBP collects and maintains data on known assists for apprehensions and seizures attributed to support by Predator B aircraft. According to CBP data provided to us, Predator B aircraft assisted in the apprehension of 7,951 individuals from fiscal years 2013 through 2016 as shown in table 2. Further, CBP data shows Predator B aircraft support assisted with the seizure of 9,190 pounds of cocaine and 223,817 pounds of marijuana from fiscal years 2013 through 2016.

Table 2: Known Seizure and Apprehension Assists Attributed to U.S. Customs and Border Protection’s Predator B Operations, Fiscal Years 2013 through 2016

Fiscal year	Cocaine (lbs.)	Marijuana (lbs.)	Apprehensions
2013	2,646	56,308	2,252
2014	992	68,624	1,834
2015	5,552	68,913	2,136
2016	0	29,972	1,729
Total	9,190	223,817	7,951

Source: U.S. Customs and Border Protection data. | GAO-17-152

- **Detections of cross-border illegal activity.** CBP tracks the number of detections made using VADER equipped on its Predator B aircraft. CBP began use of VADER at its NASOCs in Arizona in fiscal year 2012 and Texas in fiscal year 2015. In 2014, CBP began collecting data on the number of individuals detected by VADER in relation to cross-border illegal activity. Our analysis of CBP data showed that from fiscal years 2014 through 2016 about 98 percent of these detections (20,858 of 21,384 detections) were attributed to VADER used on Predator B aircraft operated from CBP’s NASOC in Arizona.⁵⁰

⁵⁰As of fiscal year 2016, CBP officials told us it is currently developing the capability to automatically track VADER usage which will include the ability to track usage by Border Patrol station AOR within 10 mile or less geographic zones.

- Launch rate.** CBP tracks the launch rate of its Predator B aircraft. Our analysis of Predator B aircraft launch rate data showed a 69 percent launch rate from fiscal years 2013 through 2016. CBP also tracks reasons for Predator B mission cancellations. Our analysis of Predator B mission cancellations found that 20 percent of all Predator B scheduled missions from fiscal years 2013 through 2016 were canceled due to weather. We also found that CBP's NASOC in Texas had the highest percentage of weather-related mission cancellations (37 percent) among NASOCs, followed by North Dakota (28 percent) and Arizona (26 percent), for Predator B missions scheduled from fiscal years 2013 through 2016. Other reasons identified for cancellations of scheduled missions from fiscal year 2013 through 2016 include aircraft maintenance (5 percent of scheduled missions) and lack of available crew (4 percent of scheduled missions), among others. For more information on the limitations related to CBP's use of Predator B aircraft, see appendix III.
- Annual flight hour goals.** CBP sets and tracks annual Predator B program flight hour goals as part of AMO's annual operational flight hour planning process.⁵¹ Our analysis of CBP data showed that CBP met 93 percent of its set flight hour goals from fiscal years 2013 through 2016. For more information on CBP's Predator B flight hour goals, see table 3.

Table 3: U.S. Customs and Border Protection Predator B Program Flight Hour Goals, Fiscal Years 2013 through 2016

Fiscal year	Flight hour goal	Actual flight hours	% of Flight hour goal
2013	4,995	5,110	102
2014	6,000	4,615	77
2015	6,000	5,515	92
2016	5,300	5,540	105
Total	22,295	20,780	93

Source: GAO analysis of U.S. Customs and Border Protection data. | GAO-17-152

These studies and data collection efforts provide CBP with useful information for assessing the effectiveness of its Predator B program. However, CBP could strengthen these efforts by more consistently recording data on Predator B missions across its operating locations. Our analysis of CBP data found that users recorded information about

⁵¹AMO implements a requirements determination process for annual aircraft flight and marine vessel underway hours based on known mission requirements, funding levels, available assets, and the needs of law enforcement partners.

supported agencies and asset assists inconsistently across Predator B operating locations within its system for recording Predator B mission data.⁵² We found that for law enforcement missions in support of multiple agencies and part of operations through joint task forces, users did not consistently record the name of the joint task force supported. For example, some users listed the supported agency only as "joint task force" without identifying the task force name, while others identified the name of the task forces supported.

Similarly, we found that some users listed one or multiple agencies that are members of the Joint Interagency Task Force – South (such as U.S. Coast Guard or AMO) rather than identifying the task force itself.⁵³ Users also misidentified supported agencies for other types of missions. For example, users did not consistently record AMO as the supported agency for maintenance and training missions and at times recorded Border Patrol instead as the supported agency. We also found users did not consistently record information on asset assists for Predator B missions. For example, no asset assist information for seizures of narcotics were recorded for CBP's NASOC in North Dakota from fiscal years 2013 through 2015 despite participation in law enforcement operations involving investigations related to the illegal production and distribution of narcotics. For example in fiscal year 2013, Predator B aircraft launched from its NASOC in North Dakota provided aerial support for investigations related to methamphetamine production and marijuana cultivation; however, as CBP does not consistently record information on asset assists, it is not known if those investigations resulted in the seizure of narcotics.

CBP's written guidance for recording Predator B mission data has not been updated since 2014 to include new data variables and system functions added to its system for recording Predator B mission data. Further, it does not include definitions and instructions for collecting and recording information on missions with multiple supported agencies and

⁵²According to AMO officials, each NASOC that launches and recovers a Predator B aircraft is responsible for recording Predator B mission information associated with that aircraft. As previously mentioned, for the purposes of our report, supported agencies include independent missions, partnerships, tasks forces, and joint operations.

⁵³According to AMO officials, in August 2016, its system for recording Predator B mission data was updated to include a feature to allow users to record mission information for task forces, such as Joint Interagency Task Force – South, instead of users listing multiple individual agencies.

asset assists for seizures and apprehensions. According to AMO officials, guidance for recording Predator B mission information has not been updated due to resource and time constraints.

AMO officials at NASOCs responsible for recording Predator B mission information told us that in the absence of updated guidance from CBP, they developed local guidance to address changes made to CBP's system for recording Predator B mission data. However, according to AMO officials, not all data are collected and recorded consistently at NASOCs as a result of differing local guidance. For example, in Arizona, NASOC officials record multiple supported agencies while NASOC officials in North Dakota only record the agency submitting the air support request even if more than one agency is supported. Moreover, according to AMO officials, not all users across Predator B operating locations have received training to use its system for recording Predator B mission data. While AMO has provided training to users responsible for recording mission information for manned aircraft and vessels in the same system at its operating locations, such as air branches, according to AMO officials, no training has been provided at its NASOCs for Predator B operations. According to AMO officials, a working group of NASOC officials met in 2015 to discuss Predator B mission data collection across its NASOCs and identified the need to record data consistently across operating locations. AMO officials we spoke with told us that limited resources have affected its ability to develop and implement training across all Predator B operating locations. According to NASOC officials responsible for recording Predator B mission information, updated guidance and training could help ensure data is collected consistently across locations as its system for recording Predator B mission data is periodically updated with new features and requirements.

Standards for Internal Control in the Federal Government calls for pertinent information to be recorded and communicated to management in a form and within a time frame that enables them to carry out internal control and other responsibilities.⁵⁴ This includes the accurate recording

⁵⁴ [GAO/AIMD-00.21.3.1](#). See also [GAO-14-704G](#): *Standards for Internal Control* calls for management to communicate quality information down and across reporting lines to enable personnel to perform key roles in achieving objectives, addressing risks, and supporting the internal control system. In addition, internal control standards state that management processes relevant data from reliable sources into quality information within the entity's information system. Management also clearly documents internal control and all transactions and other significant events in a manner that allows the documentation to be readily available for examination. The documentation may appear in management directives, administrative policies, or operating manuals, in either paper or electronic form.

and reporting of data necessary to demonstrate agency operations. Additionally, internal control standards state that all transactions and other significant events need to be clearly documented, and the documentation should be readily available for examination. The documentation should appear in management directives, administrative policies, or operating manuals and may be in paper or electronic form. Without clear guidance and training, users may continue to record Predator B mission data inconsistently for certain mission variables such as supported agencies and outcomes for asset assists. As a result, CBP is not well positioned to capture complete and consistent data from which to assess the effectiveness of its Predator B program. Updated guidance and training for users for Predator B mission data collection would help CBP ensure consistent recording across all Predator B operating locations to support CBP's efforts to assess the effectiveness of its Predator B program.

We also found that CBP collects additional information on its use of Predator B aircraft for non-CBP law enforcement agencies, but this information is not linked to data in its system for recording Predator B mission data. As mentioned previously, CBP uses Predator B aircraft to conduct missions in support of a variety of government agencies which are submitted to AMO as air support or mission requests. AMO Procedure 2014-07 includes procedures for submission and review of requests for Predator B aircraft from non-CBP law enforcement agencies and states that Predator B air support requests provide for oversight to ensure that mission requests are vetted and prioritized and requires an electronic archive be kept of all requests.⁵⁵ CBP's procedures require requests from non-CBP law enforcement agencies for Predator B aircraft support to be submitted through an air support request form which is reviewed and approved by CBP. Although CBP has a process for submission and review of air support requests for Predator B aircraft by non-CBP law enforcement agencies, these air support request forms are not recorded in its system for recording Predator B mission data. *Standards for Internal Control in the Federal Government* notes that internal controls are an integral part of each system that management uses to regulate and guide its operations, and that communication of information and control activities are an integral part of an entity's planning, implementing, review, and accountability for stewardship of

⁵⁵See Air and Marine Operations, *Unmanned Aircraft Systems Mission Prioritization for National Air Security Operations Intelligence, Surveillance, and Reconnaissance Aviation Support*, Procedure 2014-07 (July 31, 2014).

government resources and achieving effective results.⁵⁶ Furthermore, the standards state that control activities, which include a wide range of diverse actions and maintenance of related records, need to be clearly documented and help to ensure that all transactions are completely and accurately recorded. CBP currently tracks air support request forms submitted from non-CBP law enforcement agencies for Predator B missions using a separate internal system. However, by not logging or recording these requests in its system for recording Predator B mission data, CBP does not document in a single system complete information about its use of Predator B aircraft for non-CBP law enforcement purposes, such as the names of the state and local government agencies supported, making it more difficult for CBP to analyze its Predator B mission data.

While CBP currently documents requests, recording air support request forms in its system for recording Predator B mission data could allow CBP to further facilitate implementation of provisions included in the Trade Facilitation Act by ensuring such requests are documented in the same system as mission data. Specifically, these provisions require CBP to develop a process and procedure for the submission, approval, prioritization and coordination of air support requests from non-CBP law enforcement agencies for command, control, communication, surveillance, and reconnaissance assistance through unmanned aerial systems.⁵⁷ By documenting Predator B air support request forms in its system for recording Predator B mission data, CBP could also better

⁵⁶ [GAO/AIMD-00-21.3.1](#). See also [GAO-14-704G](#): *Standards for Internal Control* states that internal control is not one event, but a series of actions that occur throughout an entity's operations. Internal control is recognized as an integral part of the operational processes management uses to guide its operations rather than as a separate system within an entity. In this sense, internal control is built into the entity as a part of the organizational structure to help managers achieve the entity's objectives on an ongoing basis. Further, transactions are promptly recorded to maintain their relevance and value to management in controlling operations and making decisions. This applies to the entire process or life cycle of a transaction or event from its initiation and authorization through its final classification in summary records. In addition, management designs control activities so that all transactions are completely and accurately recorded.

⁵⁷ See Pub. L. No. 107-296, tit. IV, subtit. B, § 411, 116 Stat. at 2178-79, as amended by Pub. L. No. 114-125, tit. VIII, subtit. A, § 802(a), 130 Stat. 122, 205-06 (classified, as amended, at 6 U.S.C. § 211(k)(1)(E)). The Trade Facilitation Act calls for the establishment of a process for other federal, state, and local law enforcement agencies to submit mission requests for UAS; a formal procedure to determine whether to approve or deny such a mission request; a formal procedure to determine how such mission requests are prioritized and coordinated; and a process regarding the protection and privacy of data and images collected by CBP through the use of UAS.

oversee implementation of procedures related to Predator B air support requests along with mission information.

CBP Collects and Tracks Data to Assess Effectiveness of Its Use of Tactical Aerostats, but Could Strengthen its Data Collection Efforts

CBP has conducted two evaluations of tactical aerostats and collects and tracks data on its use of tactical aerostats. First, with regard to the two evaluations, CBP conducted these to inform its initial deployment in 2012 and continued use in 2014. In August 2012, CBP, in collaboration with the Department of Defense, conducted an initial evaluation of the operational utility of tactical aerostats in Border Patrol's Rio Grande Valley sector. CBP completed a second evaluation of its use of tactical aerostats in July 2014 to further assess the operational utility and functionality of tactical aerostats within Border Patrol's Rio Grande Valley sector. The purpose of the second evaluation was to support Border Patrol's continued use of tactical aerostats by examining operational effectiveness and comparison of capabilities and performance of tactical aerostats compared to other existing surveillance technology—for example, towers equipped with video surveillance cameras and ground sensors. CBP concluded that tactical aerostats enhance Border Patrol's situational awareness; are deployable over typical terrain with proper planning and site preparation; are operable and maintainable in the operational environment; and are a visual deterrent to transnational criminal organizations. CBP also concluded that tactical aerostats contributed to its operational effectiveness and that they provide greater cumulative surveillance coverage than towers or other ground-based systems.

Second, with regard to data, CBP collects and tracks data on its use of tactical aerostats to assess effectiveness, including data on (1) operational availability (i.e., percentage of time an aerostat is in flight providing surveillance data to CBP), (2) asset assists for apprehensions of individuals and seizures of narcotics, and (3) the number of detections of items of interest.

- **Operational availability.** According to CBP data provided to us, tactical aerostat operational availability from May 2015 through fiscal year 2016 across all sites averaged 62 percent with a range of 51 to 81 percent. CBP set a performance goal of greater than 60 percent for tactical aerostat operational availability.⁵⁸ A variety of factors can influence operational availability of a tactical aerostat, including

⁵⁸CBP established the goal in its draft Acquisition Program Baseline—a document that establishes a program's cost, schedule, and performance goals—for the tactical aerostat program.

equipment maintenance and weather as aerostat flight is subject to weather restrictions. See appendix III for more information about limitations on CBP's use of tactical aerostats.

- **Asset assists.** Border Patrol collects and maintains data on known assists for apprehensions and seizures attributed to support provided by tactical aerostats. Border Patrol collects data on asset assists for known seizures and apprehensions using DHS's Enforcement Integrated Database (EID), which includes an asset assist data field in which Border Patrol agents can specify whether an asset, such as a tower or ground sensor, contributed to the apprehension of individuals and seizure of drugs and other contraband.⁵⁹ In May 2014, CBP added an asset assist data field in EID to capture known asset assist data for "aerostats". Our analysis of CBP data showed that a majority of asset assists attributed to aerostats for the apprehension of individuals and seizure of narcotics were in Rio Grande Valley Border Patrol sector from May 2014 through fiscal year 2016. Specifically, 98 and 99 percent of total asset assists for apprehensions of individuals and seizures of narcotics were recorded in Rio Grande Valley Border Patrol sector, respectively. For more information on asset assists attributed to aerostats for seizures of narcotics and apprehension of individuals, see appendix IV.
- **Detections of items of interest.** Border Patrol also collects information on the number of detections of items of interest at each tactical aerostat site using video surveillance cameras on tactical aerostats through an internal system. Border Patrol developed a system for agents operating tactical aerostat surveillance cameras to record detections made at each site. According to Border Patrol officials, detections recorded by agents are detections of cross-border illegal activity and exclude other activities observed through tactical aerostat surveillance cameras such as recreational activities including fishing. Table 4 summarizes the number of detections recorded across all tactical aerostat sites from fiscal years 2014 through 2016.

⁵⁹EID is a shared common database repository for several DHS law enforcement and homeland security applications. EID captures and maintains information related to the investigation, arrest, booking, detention, and removal of persons encountered during immigration and criminal law enforcement investigations and operations conducted by certain DHS components. Within EID, Border Patrol uses e3 to collect and transmit data related to law enforcement activities such as biographic, encounter, and biometric data for identification and verification of individuals encountered at the border as part of CBP's law enforcement and border security mission.

Table 4: Detections Recorded Using Tactical Aerostat Video Surveillance Cameras by U.S. Border Patrol Sector, Fiscal Years 2014 through 2016

Fiscal year	Rio Grande Valley sector	Laredo sector	Total
2014	13,037	N/A	13,037
2015	27,650	N/A	27,650
2016	38,018	159	38,177
Total	78,705	159	78,864

Source: U.S. Customs and Border Protection data. | GAO-17-152

Note: N/A stands for not applicable.

Standards for Internal Control in the Federal Government states that agencies should promptly and accurately record transactions to maintain their relevance and value for management decision making.⁶⁰ In collecting and recording asset assist information, Border Patrol does not distinguish between tactical aerostats and TARS. Border Patrol issued guidance in May 2016 to users for recording tactical aerostat asset assist information in EID, which stated users were to include tactical aerostat and TARS under the same asset assist data field for aerostat. Without a separate mechanism to record tactical aerostat asset assists, users could potentially misidentify asset assist information related to tactical aerostats to TARS, limiting the completeness and usefulness of the data. For example, CBP has two tactical aerostats and one TARS deployed in Rio Grande City Border Patrol station's AOR (see figure 3), and the two types of systems provide distinct types of support when assisting with, for example, seizures and apprehensions. By recording asset assist information in EID for TARS and tactical aerostats under the same data field, CBP is not able to determine the contribution of each separate program. According to Border Patrol officials, the agency has not yet taken actions to develop a mechanism to collect asset assist information that distinguishes between TARS and tactical aerostats, but such a mechanism would be useful and could be developed outside of EID. In addition, according to Border Patrol officials, asset assist data in conjunction with detection information has been used to evaluate tactical aerostat site deployment locations related to proximity to cross-border illegal activity. Specifically, CBP officials told us the data were used to inform the relocation of a tactical aerostat site due to changes in cross-border illegal activity in Rio Grande Valley Border Patrol sector. Due to

⁶⁰ [GAO/AIMD-00.21.3.1](#). See also [GAO-14-704G](#): *Standards for Internal Control* states that transactions are promptly recorded to maintain their relevance and value to management in controlling operations and making decisions.

the constant change in cross-border illegal activity, costs associated with re-deployment of tactical aerostat sites (between \$60,000 to over \$100,000 per site), and time needed to locate and obtain access for land use for re-deployment, better data collection practices to distinguish between asset assists associated with tactical aerostats and TARS would help CBP to better ensure its data are complete to help guide resource allocation decisions.

CBP Collects and Tracks Data on its Use of TARS To Assess Effectiveness

CBP collects and tracks data on its use of TARS to assess effectiveness, including (1) operational availability or percentage of time an aerostat is in flight providing surveillance data to CBP, (2) tracks of interest (TOI) identified using TARS, and (3) assets assists associated with TOIs from TARS. Specifically:

- **Operational availability.** CBP collects performance information on TARS at each site by tracking operational availability. CBP established a performance goal of greater than 64 percent operational availability across all eight TARS sites. According to CBP data provided to us, operational availability across all TARS sites for fiscal years 2013 through 2016 ranged between 59 to 61 percent, with a range across each site of 34 to 85 percent. Table 5 shows operational availability of TARS sites from fiscal years 2013 through 2016. According to CBP data provided to us, weather-related TARS downtime resulted in an average 30 percent reduction in operational availability across all TARS sites from fiscal year 2013 through 2016. Other factors that affect operational availability include, for example, maintenance or incursion of an aircraft into the restricted airspace encompassing a TARS site.

Table 5: Operational Availability of Tethered Aerostat Radar System (TARS) Program by Site, Fiscal Years 2013 through 2016

Operational availability (%)

TARS Site	Fiscal year 2013	Fiscal year 2014	Fiscal year 2015	Fiscal year 2016
Yuma, Arizona	85	76	77	72
Fort Huachuca, Arizona	52	49	51	58
Deming, New Mexico	51	48	54	57
Marfa, Texas	34	42	41	47
Eagle Pass, Texas	61	48	60	56
Rio Grande City, Texas	63	59	52	50
Cudjoe Key, Florida	72	71	73	66
Lajas, Puerto Rico	N/A ^a	76	75	81
Total	60	59	60	61

Source: U.S. Customs and Border Protection (CBP) data. | GAO-17-152

^aN/A stands for not applicable. CBP restored operations at the TARS site in Lajas, Puerto Rico in May 2014.

- **TOIs.** CBP collects and tracks information on TOIs identified by DEOs at AMOC using information from TARS. According to CBP data, DEOs identified 1,989 TOIs from TARS from fiscal years 2013 and 2016 as shown in table 6. Further, CBP data shows that TARS were used to identify 50 to 63 percent of total TOIs detected by AMOC along the southwest border between fiscal years 2013 through 2016. From fiscal years 2013 through 2016, over 90 percent of TOIs detected were short landings in Mexico and aircraft border incursions.⁶¹ Specifically, we found 73 percent (range of 55 to 80 percent) of TOIs were short landings and 20 percent (range of 15 to 30 percent) were aircraft border incursions. See table 6 for more information on TOIs identified by DEOs at AMOC.

⁶¹TOIs classified as aircraft border incursions include incursions into U.S. borders and air defense identification zones or the areas of airspace over land or water in which the ready identification, location, and control of all aircraft is required in the interest of national security. See 14 C.F.R. § 99.3. TOIs classified as short landings include aircraft landing short of the U.S. border with Mexico possibly indicating a clandestine airstrip being used for cross-border illegal activity.

Table 6: Detections of Tracks of Interest (TOI) by Air and Marine Operations Center Using Tethered Aerostat Radar System (TARS), Fiscal Years 2013 through 2016

Fiscal year	Total TOIs detected	Total TOIs detected - TARS	% of total TOIs detected	Total TOIs detected – southwest border	Total TOIs detected – TARS – southwest border	% of total TOIs detected – southwest border
2013	1,347	538	40	997	509	51
2014	1,267	673	53	1,035	655	63
2015	1,037	448	43	769	410	53
2016	898	330	37	590	295	50
Total	4,549	1,989	44	3,391	1,869	55

Source: GAO analysis of U.S. Customs and Border Protection data. | GAO-17-152

Note: A TOI is a potential occurrence of illegal air, land, or maritime border incursion. The southwest border means the U.S-Mexico land border from California to Texas.

- **Asset assists.** CBP collects known asset assist information on TOIs identified by DEOs using TARS by coordinating with mission partners. The majority of asset assists were violations issued related to federal regulations for operation of aircraft entering, exiting, and flying in U.S. airspace.⁶² From fiscal years 2013 through 2016, CBP identified 377 violations issued related to federal regulations attributed to TOIs detected by DEOs through information from TARS; for example, pilot deviations related to penetration of restricted airspace without permission.⁶³ CBP also reported 14 arrests and 40 seizures attributed to TOIs identified through TARS. See table 7 for more information on known asset assists associated with TOIs identified using TARS from fiscal years 2013 through 2016.

⁶²Federal Aviation Regulations are contained in title 14 of the Code of Federal Regulations (C.F.R.), with rules specific to the FAA at 14 C.F.R. ch. I. See also subtitle VII of title 49 of the U.S. Code; Order 2150.3B: FAA Compliance and Enforcement Program (Oct. 1, 2007), and Order 2150.3B CHG 11: Withdrawal of Compliance and Enforcement Bulletin 2014-1 from FAA Order 2150.3B, Appendix H (Feb. 24, 2016).

⁶³For more information on CBP's role in enforcement of federal aviation regulations, see: Air and Marine Operations, *Domestic General Aviation Law Enforcement Operations, A Top-Down Review* (Oct. 1, 2014).

Table 7: Known Asset Assists Associated with Tracks of Interest (TOI) Identified by Air and Marine Operations Center Using Tethered Aerostat Radar System (TARS), Fiscal Years 2013 through 2016

Fiscal year	Total TOIs detected	Total TOIs detected – TARS	TOIs with violations	TOIs with violations - TARS	TOIs with arrest	TOIs with arrest-TARS	TOIs with seizure	TOIs with seizure-TARS
2013	1,347	538	351	99	58	7	30	6
2014	1,267	673	280	98	35	1	44	14
2015	1,037	448	313	83	42	4	41	14
2016	898	330	339	97	26	2	27	6
Total	4,549	1,989	1,283	377	161	14	142	40

Source: U.S. Customs and Border Protection data. | GAO-17-152

Conclusions

CBP uses a variety of technologies and assets to secure the border, including Predator B UAS. CBP's Predator B aircraft are used as national assets and support numerous federal and non-federal government agencies. CBP established and implemented collaborative efforts to coordinate its Predator B operations among the government agencies it supports. By documenting its procedures in all operating locations, CBP could better oversee coordination procedures as use changes based on needs and cross-border illegal activity.

CBP currently has ongoing efforts to assess the effectiveness of its Predator B program. However, improving its collection of Predator B mission data by updating guidance and implementing training would help to ensure information is collected and recorded in a standardized and consistent way across all operating locations and could also further its efforts to assess the effectiveness of its Predator B program. CBP uses tactical aerostats in south Texas to support Border Patrol's ability to detect and interdict cross-border illegal activity. CBP's tactical aerostats may be relocated as cross-border illegal activity changes, and collecting data on effectiveness of these assets could help better guide CBP's use and deployment of these assets. Border Patrol currently collects information on asset assists for its tactical aerostat program for apprehensions and seizures, but this information does not distinguish asset assists from CBP's other aerostat program—TARS. Revising its collection of asset assist data to distinguish between tactical aerostats and TARS would help better position CBP to support its use and deployment of tactical aerostats.

Recommendations for Executive Action

To improve its efforts to coordinate Predator B operations among supported agencies and assess the effectiveness of its Predator B and tactical aerostat programs, we recommend that the Commissioner of CBP take the following five actions:

- Develop and document procedures for Predator B coordination among supported agencies in all operating locations.
- Update and maintain guidance for recording Predator B mission information in its data collection system.
- Provide training to users of CBP's data collection system for Predator B missions.
- Record air support forms for Predator B mission requests from non-CBP law enforcement agencies in its data collection system for Predator B missions.
- Update Border Patrol's data collection practices to include a mechanism to distinguish and track asset assists associated with TARS from tactical aerostats.

Agency Comments and Our Evaluation

We provided a draft of this report to DHS for review and comment. DHS provided written comments, which are noted below and reproduced in full in appendix V, and technical comments, which we incorporated as appropriate. DHS concurred with the five recommendations in the report and described actions to address them as noted below.

With regard to the first recommendation related to developing and documenting procedures for Predator B coordination among supported agencies in all operating locations, DHS concurred. DHS stated that CBP plans to develop and implement an operations coordination structure and document its coordination procedures for Predator B operations through Joint Task Force – West, South Texas by September 30, 2018. DHS also stated that CBP plans to document its coordination procedures for Predator B operations through its NASOC in Grand Forks, North Dakota by September 2017.

With regard to the second recommendation related to updating and maintaining guidance for recording Predator B mission information in its data collection system, DHS concurred and stated that CBP will take actions to update and maintain guidance for recording Predator B mission information, including incorporating a new functionality in its data collection system to include tips and guidance for recording Predator B

mission information and updating its user manual for its data collection system by September 2019.

With regard to the third recommendation related to providing training to users of CBP's data collection system for Predator B missions, DHS concurred and stated that CBP is developing a schedule to train users of its data collection system for Predator B mission information. DHS provided an estimated completion date for the training of September 2018.

With regard to the fourth recommendation, related to recording air support request forms for Predator B mission requests from non-CBP law enforcement agencies in its data collection system for Predator missions, DHS concurred and stated that AMO plans to develop a process and disseminate guidance to users explaining how to maintain Predator B air support request forms in its data collection system for Predator B missions. DHS provided an estimated completion date of September 2017.

With regard to the fifth recommendation related to updating Border Patrol's data collection practices to include a mechanism to distinguish and track asset assists associated with TARS from tactical aerostats, DHS concurred and stated that Border Patrol is making improvements to capture data to ensure asset assists are properly reported and attributed to TARS and tactical aerostats. DHS provided an estimated completion date of September 2017. DHS's planned actions, if implemented effectively, should address the intent of our recommendations.

If you or your staff have any questions about this report, please contact me at (202) 512-8777 or gablerr@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix VI.



Rebecca Gambler
Director, Homeland Security and Justice

List of Requesters

The Honorable Bennie G. Thompson
Ranking Member
Committee on Homeland Security
House of Representatives

The Honorable Martha McSally
Chairwoman
Subcommittee on Border and Maritime Security
Committee on Homeland Security
House of Representatives

The Honorable Scott Perry
Chairman
Subcommittee on Oversight and Management Efficiency
Committee on Homeland Security
House of Representatives

Appendix I: U.S. Customs and Border Protection's (CBP) Recent Efforts to Implement a Small Unmanned Aerial System (UAS) Program

CBP has taken steps to implement a small UAS program to support the U.S. Border Patrol (Border Patrol).¹ Specifically:

- CBP collaborated with the Department of Homeland Security's Science and Technology Directorate (S&T) to demonstrate and analyze the potential benefits, limitations and risks of operating existing commercial off-the-shelf small UAS technology. Starting in June 2014, through its Robotic Aircraft for Public Safety (RAPS) project, S&T evaluated more than 22 small UAS platforms to assess the extent to which they could provide situational awareness in support of Border Patrol.² In July 2016, S&T's Silicon Valley Office released a solicitation for small UAS capabilities and technologies to augment CBP and Border Patrol mission capabilities. In fiscal year 2017, S&T initiated a project to perform assessments of small UAS sensors, similar to RAPS, to fill or mitigate identified Border Patrol operational capability gaps. Border Patrol officials told us it plans to continue collaboration with S&T to leverage results from past and ongoing work for asset selection, training, and concepts of operation in fiscal year 2017.
- CBP established a memorandum of agreement with the Federal Aviation Administration for small UAS operations in September 2016. The memorandum of agreement specifies provisions for operation of small UAS by CBP in the national airspace system, including advance notification requirements prior to each launch and operations at an altitude of operation at or below 1,200 feet.
- In September 2016, CBP conducted a small UAS feasibility assessment in El Paso Border Patrol sector.³ The purpose of the

¹The term "small UAS" is defined as a small unmanned aircraft weighing less than 55 pounds and its associated elements (including communication links and the components that control the small unmanned aircraft) that are required for the safe and efficient operation of the small unmanned aircraft in the national airspace system. See 14 C.F.R. § 107.3.

²S&T implemented the RAPS project to test and evaluate small UAS sensor-platform combinations. The RAPS project included the study of fixed- and rotary-wing aircraft having gross take off weights of 25 pounds or less. The primary outcome of the RAPS project is a repository consisting of test and evaluation reports, guidelines and suggestions for small UAS adoption by the operational community, and other contributions such as proposed solutions to ensure safe, non-intrusive, and secure use of these technologies in public airspace.

³This assessment was conducted in Santa Teresa Border Patrol station's area of responsibility within airspace in and around Santa Teresa, New Mexico through the issuance of a Certificate of Waiver or Authorization from the Federal Aviation Administration and advance notification process.

**Appendix I: U.S. Customs and Border
Protection's (CBP) Recent Efforts to Implement
a Small Unmanned Aerial System (UAS)
Program**

assessment was to assess the capability of small UAS technology to provide situational awareness to support Border Patrol's mission along the southwest U.S.-Mexico border and the ability of Border Patrol agents to employ small UAS. The assessment was a joint effort between CBP's Border Patrol and Air and Marine Operations and included two small UAS platforms provided by the U.S. Army.

Appendix II: Objectives, Scope, and Methodology

This report addresses the following questions:

- How does U.S. Customs and Border Protection (CBP) use unmanned aerial systems (UAS) and aerostats for border security activities, and to what extent has CBP developed and documented procedures for UAS coordination?
- To what extent has CBP taken actions to assess the effectiveness of its UAS and aerostats for border security activities?

For the purposes of our report, UAS includes Predator B UAS and aerostats include tactical aerostats and the Tethered Aerostat Radar System (TARS) program. As of November 2016, CBP is currently developing a small UAS program to support the U.S. Border Patrol (Border Patrol), see appendix I.

To address both questions, we reviewed Department of Homeland Security (DHS) and CBP strategic plans, such as DHS's fiscal years 2014 to 2018 strategic plan, CBP's fiscal years 2015 to 2020 strategic plan, Border Patrol's fiscal years 2012 through 2016 strategic plan, and Air and Marine Operation's (AMO) strategic plan. We also reviewed DHS strategies for border security, such as its Campaign Plan for Securing the U.S. Southern Border and Approaches 2015 to 2018 and Northern Border Strategy. In addition, we reviewed DHS and CBP documents related to UAS, aerostats, and surveillance technology, for example: plans, reports, concepts of operation, operational requirements, and standard operating procedures. We also reviewed relevant laws; Federal Aviation Administration (FAA) procedures, requirements and regulations for operation of UAS and aerostats in the national airspace system; and past GAO work related to UAS, aerostats, and surveillance technologies used for border security activities. We also conducted site visits to observe CBP's use of Predator B UAS and aerostats in Arizona, Texas, North Dakota, and California and interviewed CBP officials responsible for their operation.¹ Specifically:

- Arizona: We visited AMO's National Air Security Operations Center (NASOC) in Sierra Vista, Arizona to observe Predator B operations;

¹For Predator B operations, we visited all operating locations that launch and recover Predator B aircraft. For tactical aerostats, we visited three of six total sites in south Texas and for TARS, we visited one site located in Fort Huachuca, Arizona and CBP's Air and Marine Operations Center in Riverside, California. We selected the tactical aerostat and TARS sites to visit based on their proximity to Predator B operating locations.

TARS site at Fort Huachuca, Arizona; and met with CBP officials responsible for their operation.

- Texas: We visited AMO's NASOC in Corpus Christi, Texas to observe Predator B operations; three, of six total, tactical aerostat sites in south Texas to observe their use; and met with CBP officials responsible for their operations. The three tactical aerostat sites we visited included one of each type of tactical aerostat used by CBP.
- North Dakota: We visited AMO's NASOC in Grand Forks, North Dakota to observe Predator B operations and met with responsible CBP officials.
- California: We visited CBP's Air and Marine Operations Center in Riverside, California to observe use of the Air and Marine Operations Surveillance System which includes radar information from TARS sites used to detect border incursions and met with responsible CBP officials.

Findings from our observations and interviews during our site visits cannot be generalized to all occurrences of CBP's use of Predator B UAS and aerostats, but provided useful insights about the operations of these assets.

To determine how CBP uses Predator B UAS and aerostats, we reviewed and analyzed CBP data and information and interviewed responsible CBP program officials. Specifically:

- For Predator B UAS, we reviewed and analyzed CBP data on Predator B aircraft flight hours and types of mission activities from fiscal years 2013 through 2016, a time period for which data was available in CBP's current system for recording Predator B mission data—Tasking, Operations, and Management Information System.² We compared CBP's available documentation of its procedures for coordination of its use of Predator B UAS with *Standards for Internal Control in the Federal Government*.³ In addition, we reviewed

²AMO switched to a new system of record to document Predator B mission data starting in fiscal year 2013 after retiring its use of the TECS (not an acronym) module Air and Marine Operations Reporting system.

³GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999). Beginning in fiscal year 2016, [GAO/AIMD-00-21.3.1](#) is superseded by GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014). Because our audit work applied to fiscal years 2013 through 2016, this report refers to [GAO/AIMD-00-21.3.1](#).

provisions included in the Trade Facilitation and Trade Enforcement Act of 2015 requiring the establishment of standard operating procedures for CBP's UAS program to address coordination of mission requests, among other things.⁴

- For tactical aerostats, we reviewed CBP documents, such as Rio Grande Valley Border Patrol sector's Fiscal Year 2015 Aerostat Operational Need Statement⁵, and information on bi-national law enforcement efforts between Border Patrol and the government of Mexico from fiscal years 2014 through 2016, a time period for which information was available.
- For TARS, we reviewed information on CBP's Air and Marine Operations Surveillance System and ongoing analysis of alternatives for the TARS program.

To determine how CBP assesses the effectiveness of its Predator B UAS and aerostats for border security activities, we analyzed CBP performance assessment documentation, such as reports and concepts of operation, related to use of Predator B UAS and aerostats and interviewed CBP officials responsible for performance measurement activities. We also analyzed and reviewed CBP data on Predator B UAS and aerostat performance for assists provided for apprehensions of individuals, seizures of narcotics, and other events (asset assists). Specifically:

- For Predator B UAS, we analyzed asset assist, launch rate, and flight hour goal data from fiscal years 2013 through 2016, a time period for which data was available in CBP's current system of record for Predator B mission data—Tasking, Operations, and Management Information System.
- For TARS, we reviewed summary data on asset assists and operational availability from fiscal years 2013 through 2016, the time period starting when CBP assumed control of the program from the Department of Defense.
- For tactical aerostats, we analyzed asset assist data beginning in May 2014 through fiscal year 2016, a time period starting when CBP

⁴See Pub. L. No. 107-296, tit. IV, subtit. B, § 411, 116 Stat. at 2178-79, as amended by Pub. L. No. 114-125, tit. VIII, subtit. A, § 802(a), 130 Stat. at 205-06 (classified, as amended, at 6 U.S.C. § 211(k)(1)(E)).

⁵U.S. Border Patrol, *Rio Grande Valley Sector Fiscal Year 2015 Aerostat Operational Need Statement* (July 14, 2014).

began collecting information in Border Patrol's system of record for assist information—e3 within DHS's Enforcement Integrated Database. We also reviewed summary data on tactical aerostat operational availability from May 2015 through fiscal year 2016, a time period for which data was available.

To determine reliability of Predator B and aerostat data, we examined data for any anomalies, reviewed CBP guidance and documents, and interviewed CBP officials to understand their methods for collecting, reporting, and validating the data. We found these data were reliable for our purposes of reporting summary data across fiscal years 2013 through 2016. We assessed CBP's data collection and management practices for Predator B UAS and tactical aerostats for usage and performance data against the management standards and practices contained in *Standards for Internal Control in the Federal Government*.⁶

To identify costs associated with UAS and aerostats, we obtained and reviewed financial summary data and cost per flight hour information for Predator B UAS, TARS, and tactical aerostats. These data include summary information on end-of-year obligations and expenditures by cost category compiled by CBP for fiscal year 2015, the most recent fiscal year for which complete data was available. We also reviewed Aviation Governance Board Bulletin 2015-001: DHS Standard Aviation Comparable Cost per Flight Hour Reporting Methodology and supporting documentation to determine how CBP applied that methodology to develop its fiscal year 2015 cost per flight hour for Predator B UAS, TARS, and tactical aerostats. We determined that CBP's summary financial and obligation data and cost per flight hour information for its Predator B, tactical aerostat, and TARS programs were sufficiently reliable for our reporting purposes.

We conducted this performance audit from November 2015 to February 2017 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

⁶[GAO/AIMD-00.21.3.1](#).

Appendix III: Limitations Related to U.S. Customs and Border Protection's (CBP) Use of Predator B Unmanned Aerial Systems and Tactical Aerostats for Border Security

Predator B Aircraft

Based on our review of data and interviews with CBP officials, CBP's use of Predator B aircraft is limited, in part, due to weather and airspace access. For example:

- **Weather.** Hazardous weather can directly impact take off and landing of Predator B aircraft at Air and Marine Operations (AMO) National Air Security Operations Centers (NASOC), including storms and cloud cover. As previously mentioned, weather accounted for 20 percent of Predator B mission cancelations from fiscal years 2013 through 2016. Hazardous weather can also limit where Predator B aircraft operate away from its NASOC launch site. According to CBP officials we spoke with in North Dakota, weather in locations distant from where a Predator B aircraft is launched can also limit operating locations as there are no diversion airports along the U.S.-Canadian border for CBP's Predator B aircraft to land. CBP took steps to mitigate the impact of hazardous weather in January and February 2016 by deploying Predator B aircraft from Corpus Christi, Texas, to San Angelo, Texas, at San Angelo Regional Airport which had favorable weather conditions. CBP's deployment of Predator B aircraft at San Angelo Regional Airport was in accordance with a Federal Aviation Administration (FAA)-issued Certificate of Waiver or Authorization (COA) to conduct its border security mission in Texas, lasted approximately 3 weeks, and was supported by an existing AMO Air Unit co-located at San Angelo Regional Airport. According to AMO officials, three Predator B aircraft are scheduled to be deployed to San Angelo Regional Airport from January 2017 through April 2017.
- **National airspace access.** CBP's Predator B aircraft operations are limited to COA-designated and restricted airspace. To fly outside of COA-designated airspace, CBP must request and receive an addendum to an existing COA or submit a new COA to FAA. CBP's Predator B operations in special use or restricted airspace are subject to agreements established between CBP and the Department of Defense which may limit airspace access to certain time periods.¹ According to CBP officials we spoke with in Arizona, Predator B flights are often excluded from restricted airspace managed by the Department of Defense along border areas which can affect the ability of Predator B aircraft to support U.S. Border Patrol (Border Patrol). For example, CBP officials told us Predator B aircraft infrequently support Yuma Border Patrol sector as portions of its area of

¹Restricted areas are established to separate activities considered to be hazardous to other aircraft, such as artillery firing or aerial gunnery.

responsibility (AOR) along the border are covered by an area of restricted airspace managed by the U.S. Marine Corps who typically limit Predator B aircraft access to one hour or less per day.² In addition, CBP officials also told us it infrequently flies Predator B aircraft in southern California due to airspace restrictions related to the volume of commercial air traffic in and around Los Angeles, California and San Diego, California.

Tactical Aerostats

Based on our review of documents and interviews with CBP officials, CBP's use of tactical aerostats is limited, in part, due to weather, access to airspace, and real estate. For example:

- **Weather.** According to CBP officials, weather has the greatest impact on CBP's ability to use tactical aerostats, including storms which require CBP to cease flight operations. For example in May 2015, a tactical aerostat broke free from its tether as of the result of severe winds during a thunderstorm.
- **Access to airspace.** We also found that airspace access can impact CBP's ability to deploy and use tactical aerostats in south Texas as aerostat site placement is subject to FAA approval to ensure the aerostat does not converge on dedicated flight paths. According to CBP, airspace access is limited in Border Patrol's Rio Grande Valley sector's Weslaco and Rio Grande City stations' AOR.
- **Real estate.** Aerostat sites used by CBP may involve access to private property, and according to CBP, it would generally seek land owner approval prior to placement. According to CBP, tactical aerostat sites are used by CBP at no cost to the government and challenges may arise with respect to processes for landowners to request compensation for use of their property or restoration of land back to its original condition. In addition, according to CBP officials, it must take into consideration any relevant environmental and wildlife impacts prior to deployment of a tactical aerostat, such as flood zones, endangered species, and migratory animals, among others.

²For example, see R-2301W in Federal Aviation Administration, *Order JO 7400.8Y: Special Use Airspace* (Feb. 5, 2016).

Appendix IV: Summary Statistics on the Reporting of Asset Assist Data for Apprehensions and Seizures for Aerostats, May 2014 through Fiscal Year 2016

Department of Homeland Security’s (DHS) Enforcement Integrated Database includes a field that enables U.S. Border Patrol (Border Patrol) agents to identify whether a technological or nontechnological asset assisted in the apprehension of illegal entrants or the seizure of drugs or other contraband. This appendix provides summary statistics on the reporting of asset assists by Border Patrol agents for the data field “aerostat” across all Border Patrol sectors from May 2014 through fiscal year 2016.¹

As mentioned earlier, the asset assist data field “aerostat” does not distinguish asset assists identified by Border Patrol agents from U.S. Customs and Border Protection’s (CBP) tactical aerostats and Tethered Aerostat Radar System program. As of fiscal year 2016, CBP deployed one tactical aerostat in Laredo and five tactical aerostats in Rio Grande Valley Border Patrol sectors. CBP’s Tethered Aerostat Radar System Program includes sites in Yuma, Arizona; Fort Huachuca, Arizona; Deming, New Mexico; Marfa, Texas; Eagle Pass, Texas; Rio Grande City, Texas; Cudjoe Key, Florida; and Lajas, Puerto Rico.

As shown in table 8, the majority of apprehension and seizure events with asset assists attributed to aerostats occurred in the Rio Grande Valley sector from May 2014 through fiscal year 2016 (98 and 99 percent, respectively).

Table 8: Number of Asset Assists for Apprehension and Seizure Events by U.S. Border Patrol Sectors and Stations Areas of Responsibility (AOR) Attributed to Aerostats, May 2014 through Fiscal Year 2016		
AOR	Seizure events	Apprehension events
Del Rio sector	0	336
Abilene station	0	11
Carrizo Springs station	0	101
Eagle Pass South station	0	224
El Centro sector	0	6
Calexico station	0	6
El Paso sector	0	13
Alamogordo station	0	9
Santa Teresa station	0	4

¹As mentioned previously, this time period was selected starting when the asset assist data field “aerostat” was added to DHS’s Enforcement Integrated Database in May 2014.

Appendix IV: Summary Statistics on the Reporting of Asset Assist Data for Apprehensions and Seizures for Aerostats, May 2014 through Fiscal Year 2016

AOR	Seizure events	Apprehension events
Laredo sector	1	326
Freer station	0	1
Hebbronville station	0	214
Laredo South station	0	14
Laredo West station	0	9
Zapata station	1	88
New Orleans sector	0	1
Baton Rouge station	0	1
Rio Grande Valley sector	674	48,561
Brownsville station	0	1
Corpus Christi station	0	6
Falfurrias station	4	6,234
Fort Brown station	0	5
Harlingen station	0	1
Kingsville station	0	564
McAllen station	94	15,389
Rio Grande City station	558	25,603
Weslaco station	18	758
San Diego sector	0	4
Brown Field station	0	3
El Cajon station	0	1
Tucson sector	5	70
Ajo station	2	53
Douglas station	0	1
Tucson station	3	16
Yuma sector	1	0
Yuma station	1	0
Total	681	49,317^a

Source: GAO analysis of U.S. Customs and Border Protection (CBP) data. | GAO-17-152

Notes: For the purposes of our analysis, we define “apprehension event” and “seizure event” as an occasion on which U.S. Border Patrol (Border Patrol) agents make an apprehension of an illegal entrant or seizure of contraband or narcotics. The event is recorded in the Enforcement Integrated Database. An event can involve the seizure of one or multiple illegal items. Data shown is for the asset assist data field “aerostat” where Border Patrol agents have identified an aerostat contributed to an apprehension or seizure. As of the end of fiscal year 2016, CBP had deployed tactical aerostats in Rio Grande Valley and Laredo sectors.

^aTotal apprehensions listed only include apprehensions associated with Border Patrol sector and station AORs. Border Patrol reported a total of 50,538 apprehensions, including apprehension events not associated in sector and station AORs from May 2014 through fiscal year 2016.

Appendix IV: Summary Statistics on the
Reporting of Asset Assist Data for
Apprehensions and Seizures for Aerostats,
May 2014 through Fiscal Year 2016

As shown in table 9, the majority of seizure events and largest quantity of narcotics seized occurred in the Rio Grande Valley sector from May 2014 through fiscal year 2016. Specifically, asset assists attributed to aerostats in Rio Grande Valley sector accounted for 674 seizure events, including 257,692 and 129 pounds of marijuana and cocaine, respectively.

Table 9: Number and Quantity of Seizure Events by U.S. Border Patrol Sectors and Stations Areas of Responsibility (AOR) Attributed to Aerostats, May 2014 through Fiscal Year 2016

Seizure events attributed to “aerostat”

AOR	Number and quantity of seizures (lbs.)			
	Number	Marijuana	Cocaine	Other drugs ^a
Laredo sector	1	347	0	0
Zapata station	1	347	0	0
Rio Grande Valley sector	674	257,692	129.01	0.2
Falfurrias station	4	780	0	0
McAllen station	94	21,572	0	0
Rio Grande City station	558	229,717	129	0.2
Weslaco station	18	5,623	0.01	0
Tucson sector	5	1,594	0	0
Ajo station	2	1,173	0	0
Tucson station	3	421	0	0
Yuma sector	1	226	0	0
Yuma station	1	226	0	0
Total	681	259,859	129.01	0.2

Source: GAO analysis of U.S. Customs and Border Protection (CBP) data. | GAO-17-152

Notes: For the purposes of our analysis, we define “seizure event” as an occasion on which U.S. Border Patrol (Border Patrol) agents seize contraband or narcotics. The event is recorded in the Enforcement Integrated Database. An event can involve the seizure of one or multiple illegal items. Data shown is for the asset assist data field “aerostat” where Border Patrol agents have identified an aerostat contributed to a seizure. As of the end of fiscal year 2016, CBP had deployed tactical aerostats in Rio Grande Valley and Laredo sectors.

^aIncludes methamphetamine, barbiturates, and other drugs.

Appendix V: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528



**Homeland
Security**

January 27, 2017

Rebecca Gambler
Director, Homeland Security and Justice
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Re: Management's Response Draft Report GAO-17-152, "BORDER SECURITY:
Additional Actions Needed to Strengthen Collection of Unmanned Aerial
Systems and Aerostats Data"

Dear Ms. Gambler,

Thank you for the opportunity to review and comment on this draft report. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO) work in planning and conducting its review and issuing this report.

The Department is pleased to note GAO's positive recognition of the wide-ranging accomplishments the U.S. Customs and Border Protection's (CBP's) Air and Marine Operations (AMO) has achieved deploying unmanned aircraft systems (UAS) and aerostats, collecting data on border security operations and the results of these programs, documenting policies and procedures, and initiating and completing studies and evaluations to assess the effectiveness of UAS and aerostats.

The draft report highlights the extensive efforts CBP has made towards performing its border security missions and tracking operations, such as maintaining data on the operations of its Predator B UAS, including independent operations and joint operations as members of partnerships, task forces, and other whole-of-government networks. GAO also recognized the contributions made by the Predator B, as well as CBP's effort to achieve the departmental goal of unity of effort and progress made in tracking its operations.

CBP uses tactical aerostats to detect illegal cross-border activity, and tethered aerostat radar systems (TARS) to achieve domain awareness along the southern border and approaches to the United States. These operational capabilities are possible as a result of

CBP's collaboration with the Federal Aviation Administration and Department of Defense, and are great examples of CBP's support of a whole-of-government approach.

CBP's establishment of national policies and local standard operating procedures for coordination and prioritization of Predator B operations is also a significant accomplishment, which involved extensive collaboration across components over recent years. As part of its commitment to continuous process improvement, CBP will expand local best practices to other Predator B locations, as appropriate.

In addition, CBP continues to make extensive efforts to assess the effectiveness of its Predator B and aerostats programs. CBP has initiated multiple studies and evaluations to help the agency assess the effectiveness of these systems, and collects and tracks data related to their operations.

DHS employs a range of strategies to improve upon border security, as well as to exclude terrorist threats, drug traffickers, and other threats to national security, economic security, and public safety. DHS will continue its extensive efforts to enhance our ability to identify threats or hazards before they emerge in the United States.

The draft report contains five recommendations with which the Department concurs. Attached find our detailed response to each recommendation.

Again, thank you for the opportunity to review and comment on this draft report. Technical comments were previously provided under separate cover. Please feel free to contact me if you have any questions. We look forward to working with you again in the future.

Sincerely,



JIM H. CRUMPACKER, CIA, CFE
Director
Departmental GAO-OIG Liaison Office

Attachment

**Attachment: DHS Management Response to Recommendations
Contained in GAO-17-152SU**

GAO recommended that the Commissioner of U.S. Customs and Border Protection (CBP) take the following actions:

Recommendation 1: Develop and document procedures for Predator B coordination among supported agencies in all operating locations.

Response: Concur. CBP AMO has coordinated internally, with partner agencies, and joint task forces to develop mature Predator B tasking and operations coordination mechanisms for the Joint Task Force – West (JTF-W) Arizona Corridor. Local practices at the two other Predator B launch and recovery locations; JTF-W South Texas Corridor and at National Air Security Operations Center (NASOC) – Grand Forks will be enhanced.

Northern and southwest border Predator B operations require a different approach and coordination structure. Northern border operations are predominantly intelligence-based, requiring a less reactive and more strategic coordination model involving specific target sets supporting ongoing law enforcement cases. Patrols on the northern border do not produce results justifying the same coordination processes as the southwest.

As such, CBP AMO will (1) develop and implement a Predator B operations coordination structure for the JTF-W South Texas Corridor location similar to JTF-W Arizona, then document the coordination procedures, and (2) document coordination procedures on the Northern border at NASOC – Grand Forks. CBP intends to achieve the following milestones:

- Document NASOC–Grand Forks coordination procedures by September 30, 2017
- Develop and implement an operations coordination structure, and document coordination procedures for the JTF-W South Texas by September 30, 2018

Estimated Completion Date (ECD): September 30, 2018.

Recommendation 2: Update and maintain guidance for recording Predator B mission information in its data collection system.

Response: Concur. In alignment with its commitment to continuous process improvement, CBP AMO is in the process of refining its system of record with new functionality to record Predator B mission data in a phased approach. Phase 1, a short-term solution, will include dissemination of guidance to the field when new

functionality is incorporated into the system. Phase 2, a permanent solution, will include tips and guidance functions within the software system. Phase 2 will reach all users of the system as they input data. Phase 3 will incorporate all Tasking, Operations, and Management Information System (TOMIS) functionality within an updated manual. CBP intends to achieve the following milestones:

- Phase 1 will be complete by September 30, 2017
- Phase 2 will be completed by September 30, 2018
- Phase 3 is scheduled to be completed by September 30, 2019

ECD: September 30, 2019.

Recommendation 3: Provide training to users of CBP's data collection system for Predator B missions.

Response: Concur. CBP AMO is currently developing a training schedule for AMO Headquarters personnel to conduct training of the system as it stands today at each Predator B location. Once Phase 2 is complete, training will be provided to all system administrators, which will be supported by the tips and guidance built into the system. ECD: September 30, 2018.

Recommendation 4: Record air support forms for Predator B mission requests from non-CBP law enforcement agencies in its data collection system for Predator B missions.

Response: Concur. CBP AMO has an approved policy for submitting, reviewing, approving, and archiving air support requests. These air support requests are not stored in the TOMIS, the system of record for Predator B mission data, but in a separate internal system. AMO believes that maintaining the air support requests in TOMIS is an appropriate means for recording and accessing the data. AMO will develop a process and disseminate guidance to the field, explaining how to maintain the air support requests within TOMIS. ECD: September 30, 2017.

Recommendation 5: Update U.S. Border Patrol's data collection practices to include a mechanism to distinguish and track asset assists associated with TARS from tactical aerostats.

Response: Concur. Tactical aerostats were deemed an immediate deployment solution and deployed in November 2014. Where deployed, these assets have contributed to increased apprehension and seizure rates. U.S. Border Patrol (Border Patrol) is making improvements to ensure the integrity of all statistical data related to their deployment. Border Patrol is capturing data within existing systems. Guidance has been provided to the field on properly recording detection methods utilized during the course of routine operations to ensure that tethered aerostat radar systems (TARS) and Tactical Aerostat

4

data is available to query for reports when requested. The deployment of aerostats will be easily distinguishable due to locations of apprehensions. Border Patrol data integrity teams from sectors and Headquarters will have the information needed to ensure these apprehension assists are properly reported and individually attributed to TARS and Tactical Aerostats. ECD: September 30, 2017.

Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

Rebecca Gambler at (202) 512-8777 or GamblerR@gao.gov

Staff Acknowledgments

In addition to the contact named above, Kirk Kiester (Assistant Director), Chuck Bausell, Eric Hauswirth, Daniel McKenna, Amanda Miller, Sasan J. (Jon) Najmi, and Carl Potenzieri made key contributions to this report.

Related GAO Products

Border Security: DHS Surveillance Technology Unmanned Aerial Systems and Other Assets. [GAO-16-671T](#). Washington, D.C.: May 24, 2016.

Homeland Security Acquisitions: DHS Has Strengthened Management, but Execution and Affordability Concerns Endure. [GAO-16-338SP](#). Washington, D.C.: March 31, 2016.

Southwest Border Security: Additional Actions Needed to Assess Resource Deployment and Progress. [GAO-16-465T](#). Washington, D.C.: March 1, 2016.

Border Security: Progress and Challenges in DHS's Efforts to Implement and Assess Infrastructure and Technology. [GAO-15-595T](#). Washington, D.C.: May 13, 2015.

Unmanned Aerial Systems: Department of Homeland Security's Review of U.S. Customs and Border Protection's Use and Compliance with Privacy and Civil Liberty Laws and Standards. [GAO-14-849R](#). Washington, D.C.: September 30, 2014.

Border Security: Opportunities Exist to Strengthen Collaborative Mechanisms along the Southwest Border. [GAO-14-494](#). Washington, D.C.: June 27, 2014.

Arizona Border Surveillance Technology Plan: Additional Actions Needed to Strengthen Management and Assess Effectiveness. [GAO-14-411T](#). Washington, D.C.: March 12, 2014.

Arizona Border Surveillance Technology Plan: Additional Actions Needed to Strengthen Management and Assess Effectiveness. [GAO-14-368](#). Washington, D.C.: March 3, 2014.

Border Security: Progress and Challenges in DHS Implementation and Assessment Efforts. [GAO-13-653T](#). Washington, D.C.: June 27, 2013.

Border Security: DHS's Progress and Challenges in Securing U.S. Borders. [GAO-13-414T](#). Washington, D.C.: March 14, 2013.

Border Security: Opportunities Exist to Ensure More Effective Use of DHS's Air and Marine Assets. [GAO-12-518](#). Washington, D.C.: March 30, 2012.

U.S. Customs and Border Protection's Border Security Fencing, Infrastructure and Technology Fiscal Year 2011 Expenditure Plan. [GAO-12-106R](#). Washington, D.C.: November 17, 2011.

Arizona Border Surveillance Technology: More Information on Plans and Costs Is Needed before Proceeding. [GAO-12-22](#). Washington, D.C.: November 4, 2011.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's website (<http://www.gao.gov>). Each weekday afternoon, GAO posts on its website newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to <http://www.gao.gov> and select "E-mail Updates."

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's website, <http://www.gao.gov/ordering.htm>.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

Connect with GAO

Connect with GAO on [Facebook](#), [Flickr](#), [Twitter](#), and [YouTube](#).
Subscribe to our [RSS Feeds](#) or [E-mail Updates](#). Listen to our [Podcasts](#).
Visit GAO on the web at www.gao.gov.

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Website: <http://www.gao.gov/fraudnet/fraudnet.htm>

E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Katherine Siggerud, Managing Director, siggerudk@gao.gov, (202) 512-4400,
U.S. Government Accountability Office, 441 G Street NW, Room 7125,
Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, DC 20548

Strategic Planning and External Liaison

James-Christian Blockwood, Managing Director, spel@gao.gov, (202) 512-4707
U.S. Government Accountability Office, 441 G Street NW, Room 7814,
Washington, DC 20548



Please Print on Recycled Paper.