



November 2017

SOUTHWEST BORDER SECURITY

Border Patrol Is
Deploying
Surveillance
Technologies but
Needs to Improve
Data Quality and
Assess Effectiveness

GAO Highlights

Highlights of [GAO-18-119](#), a report to congressional requesters

Why GAO Did This Study

The southwest border has long been vulnerable to cross-border illegal activity. In fiscal year 2016, Border Patrol apprehended over 409,000 illegal entrants. Border Patrol has employed a variety of land-based surveillance technologies to assist in securing the border. GAO has reported regularly on CBP's progress and challenges deploying surveillance technologies.

GAO was asked to review CBP's use of surveillance technology. This report examines (1) the deployment status of surveillance technology programs and the extent to which CBP has developed plans for future technology deployments and (2) what data are available on the contributions of deployed technologies to CBP's border security efforts and the extent to which CBP has assessed technology performance.

GAO analyzed technology program documents; interviewed CBP and Border Patrol officials; and conducted site visits to Arizona and south Texas to observe the operation of various land-based technologies. We selected these locations because CBP has deployed or has plans to deploy a mix of technologies there, among other factors.

What GAO Recommends

GAO recommends that Border Patrol issue guidance to improve the quality and usability of its asset assist information. DHS concurred with GAO's recommendation.

View [GAO-18-119](#). For more information, contact Rebecca Gambler at (202) 512-8777 or gambler@gao.gov.

November 2017

SOUTHWEST BORDER SECURITY

Border Patrol Is Deploying Surveillance Technologies but Needs to Improve Data Quality and Assess Effectiveness

What GAO Found

The U.S. Border Patrol, within the Department of Homeland Security's (DHS) U.S. Customs and Border Protection (CBP), has made progress deploying surveillance technology along the southwest U.S. border under its 2011 Arizona Technology Plan (ATP) and 2014 Southwest Border Technology Plan. The ATP called for deployment of a mix of radars, sensors, and cameras in Arizona; the 2014 plan expanded these deployments to the rest of the southwest border. As of October 2017, Border Patrol had completed the planned deployment of select technologies to Arizona, Texas, California, and New Mexico. For example, in Arizona, Border Patrol deployed all planned Remote Video Surveillance Systems (RVSS) and Mobile Surveillance Capability (MSC) systems, and 15 of 53 planned Integrated Fixed Tower (IFT) systems. Border Patrol also deployed all planned MSC systems to Texas, California, and New Mexico and completed contract negotiations to deploy RVSS to Texas. These technology programs have experienced delays, but are currently on track against revised program schedules and cost baselines. To plan for future technology deployments, Border Patrol reports it will use its Requirements Management Process (RMP)—a process designed to facilitate planning by, among other things, identifying capability gaps and collecting agents' feedback—and other initiatives. Border Patrol is currently developing written guidance for the RMP to ensure station officials understand their roles and responsibilities in the process.

Mobile Surveillance Capability System and Integrated Fixed Tower, Arizona



Source: GAO. | GAO-18-119

Border Patrol agents collect and report data on asset assists, which are instances in which technologies or other assets (such as canine teams) contributed to an apprehension or seizure; however, Border Patrol has not provided sufficient guidance to ensure the accuracy and reliability of that data. For example, agents incorrectly attributed some apprehensions or seizures to certain technologies rather than others. Stations in the Rio Grande Valley sector recorded assists from IFTs in about 500 instances from June through December 2016; however, this sector does not have IFTs. Data integrity and quality checks are the responsibility of individual sectors, but Border Patrol has provided limited guidance on how to ensure data quality. Without sufficient guidance to ensure the quality of asset assist data, Border Patrol is limited in its ability to determine the mission benefits of its surveillance technologies and use information on benefits to inform resource allocation decisions.

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Abbreviations

APSS	Agent Portable Surveillance System
ATP	Arizona Border Surveillance Technology Plan
Border Patrol	U.S. Border Patrol
CAD	DHS's Cost Analysis Division
CBP	U.S. Customs and Border Protection
DHS	Department of Homeland Security
EID	Enforcement Integrated Database
IFT	Integrated Fixed Towers
MSC	Mobile Surveillance Capability
MVSS	Mobile Video Surveillance System
PARM	Office of Program Accountability and Risk Management
PMOD	Border Patrol Program Management Office Directorate
RMP	Requirements Management Process
RVSS	Remote Video Surveillance System
SBI-net	Secure Border Initiative Network
TID	Thermal Imaging Devices
TSM	Tracking, Sign Cutting, Modeling System
UGS	Unattended Ground Sensors

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November 30, 2017

The Honorable Claire McCaskill
Ranking Member
Committee on Homeland Security and Governmental Affairs
United States Senate

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

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

The southwest border of the United States has long been vulnerable to cross-border illegal activity. Within the Department of Homeland Security (DHS), U.S. Customs and Border Protection's (CBP) U.S. Border Patrol (Border Patrol) is the federal agency responsible for securing the national borders between U.S. ports of entry.¹ According to Border Patrol data, total apprehensions of illegal entrants across the southwest border increased from about 331,000 in fiscal year 2015 to about 409,000 in fiscal year 2016.

Border Patrol has employed a variety of land-based surveillance technologies to assist in securing the border and apprehending individuals attempting to cross the border illegally. In November 2005, DHS launched the Secure Border Initiative, which was responsible for developing a comprehensive border protection system based on tower-mounted radar and camera technologies, known as the Secure Border

¹See 6 U.S.C. § 211(a) (establishing CBP within DHS), (c) (enumerating CBP's duties), (e) (establishing and listing duties of U.S. Border Patrol within CBP). Ports 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 and merchandise, collect duties, and enforce customs laws, and where DHS officers inspect persons entering or applying for admission into, or departing the United States pursuant to U.S. immigration law.

Initiative Network (SBlNet).² By 2010, at a cost of about \$1 billion, CBP had deployed 15 SBlNet tower systems along 53 miles of Arizona's 387-mile border with Mexico.³ However, in January 2011, in response to internal and external assessments that identified concerns regarding the performance, cost, and schedule for implementing the systems, the Secretary of Homeland Security announced the cancellation of future SBlNet systems. That same month, CBP introduced the Arizona Border Surveillance Technology Plan (ATP) for deploying technology along the remainder of the Arizona border. The ATP was based on a mix of fixed and mobile technology systems, including radars, sensors, and cameras that could be tailored to the varying terrain and operating conditions along the border to help provide security for the remainder of the Arizona border. In June 2014, CBP developed a separate plan that incorporated the ATP and extended land-based surveillance technology deployments to the remainder of the southwest border—the Southwest Border Technology Plan.⁴

Over the years, we have reported on the progress DHS has made and challenges it has faced in implementing its border security efforts.⁵ More specifically, in November 2011 we reported on DHS's planning efforts related to the ATP and found that CBP did not have the information needed to fully support and implement the plan. Among other things, we recommended that CBP ensure the underlying analyses of the plan were documented in accordance with DHS guidance and internal control standards, develop and apply key attributes for metrics to assess program implementation, and conduct a post-implementation review and operational assessment of SBlNet. DHS concurred with these recommendations and has taken action toward addressing some of them, as we discuss later in this report. In March 2014, we reported on DHS's

²The SBlNet towers were intended to transmit radar and camera information into a common operating picture at work stations manned at all times by Border Patrol agents.

³These SBlNet systems were deployed to the Tucson and Ajo stations within Border Patrol's Tucson sector of Arizona (Border Patrol divides geographic responsibility among nine sectors along the southwest border). Border Patrol began using the systems in 2010.

⁴U.S. Customs and Border Protection, *Southwest Border Technology Plan White Paper* (Washington, D.C.: June 12, 2014).

⁵See, for example, GAO, *Arizona Border Surveillance Technology Plan: Additional Actions Needed to Strengthen Management and Assess Effectiveness*, [GAO-14-368](#) (Washington, D.C.: Mar. 3, 2014) and *Arizona Border Surveillance Technology: More Information on Plans and Costs Is Needed before Proceeding*, [GAO-12-22](#) (Washington, D.C.: Nov. 4, 2011).

progress in deploying land-based surveillance technologies under the ATP and efforts to assess the contributions of those technologies to border security. We found, among other things, that CBP's schedules and life-cycle cost estimates reflected some, but not all, best practices, and CBP had not developed an Integrated Master Schedule for the ATP. We recommended that CBP apply scheduling best practices, and verify life-cycle cost estimates, among other things. DHS concurred with some, but not all, of these recommendations, and has taken action toward addressing some of them, as we discuss later in this report.

You asked us to review the status of DHS's efforts to implement the Southwest Border Technology Plan. This report addresses the following two questions:

1. What is the deployment status of the technology programs under the Southwest Border Technology Plan, and to what extent has CBP developed plans for future technology deployments?
2. What data are available on the contributions of the deployed technologies to CBP's border security efforts, and to what extent has CBP assessed the technologies' performance?

To determine the deployment status of the technology projects under the Southwest Border Technology Plan and the extent to which CBP has developed plans for future technology deployments, we analyzed DHS and CBP documents and interviewed CBP officials regarding the technology programs' costs and schedules. We focused on the plan's three highest-cost technology programs—the Integrated Fixed Tower (IFT), Remote Video Surveillance System (RVSS), and Mobile Surveillance Capability (MSC).⁶ As part of our work, we reviewed key planning and funding documents, including acquisition decision memos for these programs and relevant DHS acquisition management policies and processes. We analyzed CBP's revised schedules and cost estimates for these programs and compared them against the originally

⁶An IFT system consists of surveillance equipment (for example, ground surveillance radars and surveillance cameras) mounted on stationary towers. An RVSS system consists of multiple daylight and infrared cameras mounted on poles, towers, or buildings. Unlike the IFT, the RVSS does not include radar. An MSC is a stand-alone system that consists of radar and cameras mounted 25 feet high on a truck, with a display within the cab of the truck.

planned baselines for the selected technologies.⁷ As discussed in this report, we also identified technology deployment challenges that CBP was experiencing in testing, procuring, deploying, and operating technologies in the Southwest Border Technology Plan. We analyzed relevant documents and interviewed program officials from the Border Patrol's Program Management Office Directorate (PMOD) about the causes of those challenges, the associated risk of program delays, and their plans to manage those risks. Further, we interviewed CBP officials and analyzed documents to determine the progress CBP and DHS have made in implementing prior GAO recommendations to improve management of surveillance technology programs.

In addition, we conducted site visits to Arizona in November 2016 and April 2017 and to south Texas in March 2017. During these site visits, we observed border surveillance operations, interviewed Border Patrol agents operating technologies, and discussed agents' experiences utilizing the technologies. In Arizona, we visited five Border Patrol stations within the Tucson sector—Ajo, Brian A. Terry, Douglas, Nogales, and Tucson stations. We also conducted telephone interviews with officials from two additional stations within the Tucson sector—Casa Grande and Sonoita—and from the Yuma sector. We selected the Tucson and Yuma sectors because CBP has deployed a mix of technologies there and we selected specific stations in order to observe a variety of those technologies. To learn about CBP's planning for border surveillance technologies along the south Texas border, we visited four Border Patrol stations within the Rio Grande Valley sector—McAllen, Rio Grande City, Weslaco, and Harlingen stations. We selected the Rio Grande Valley sector and stations within that sector because Border Patrol determined that the capability gaps in these stations constituted a critical vulnerability to border security, among other factors. While the information we obtained from interviews with officials in these sectors cannot be generalized to all Border Patrol sectors or stations within these sectors,

⁷The original baseline schedule and cost estimate is to represent the original configuration of the program plan and signify the consensus of all stakeholders regarding the required sequence of events, resource assignments, and acceptable dates for key deliverables and associated cost elements required to develop, produce, and sustain the program in the life-cycle cost estimate for the program. A rebaseline establishes new schedule, cost, or performance goals that DHS expects the program to meet. A program can be rebaselined for several reasons, such as revisions to the program's original configuration; a significant difference between the estimated cost to complete the program and the budget for remaining work; unrealistic schedule estimates or longer than expected activity durations; changes in risks associated with executing the program; and frequent or significant current or retroactive changes (e.g., data accuracy).

the interviews provided important insights on Border Patrol's process for identifying border surveillance technology needs and Border Patrol's current plans for technology deployments in each area of responsibility. To assess Border Patrol's process for identifying what land-based surveillance technologies it plans to deploy in the future, we reviewed relevant documentation from the Border Patrol Operational Requirements Management Division, which is responsible for executing Border Patrol's Requirements Management Process (RMP) and deploying technologies along the southwest border.

To determine what data are available on the contributions of the deployed land-based surveillance technologies to CBP's border security efforts and the extent to which CBP assessed the technologies' performance, we analyzed available data from DHS's Enforcement Integrated Database (EID) on apprehensions, seizures, and other events and their corresponding asset assists.⁸ Specifically, we analyzed data from fiscal years 2015 through May 3, 2017 (the most current years for which data were available) on asset assists in order to determine which assets have contributed the most to Border Patrol's activities. We reviewed Border Patrol's processes for ensuring the reliability and completeness of these data and compared those processes to standards set forth in Standards for Internal Control in the Federal Government.⁹ We report on the reliability of those data later in this report. We also reviewed available reports on technology testing and performance, including operational assessments and post-implementation reviews. Additionally, we visited Border Patrol stations within the Tucson sector, as discussed earlier, to gather agent perspectives on the impacts technologies have had on mission effectiveness, the extent to which agents' feedback during user testing has been incorporated into the final deployed systems, and the

⁸EID 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. Border Patrol uses the e3 Portal to collect and transmit data to EID related to law enforcement activities such as biographic, encounter, and biometric data for identification and verification of individuals encountered at the border. For the purposes of this report, apprehensions include individuals arrested and identified as potentially removable aliens by Border Patrol. Seizures include Border Patrol apprehensions of drugs, currency, and weapons, among other things. An asset assist occurs when a technological asset, such as an IFT surveillance tower, or a nontechnological asset, such as a canine team, contributes to apprehensions or seizures.

⁹GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014).

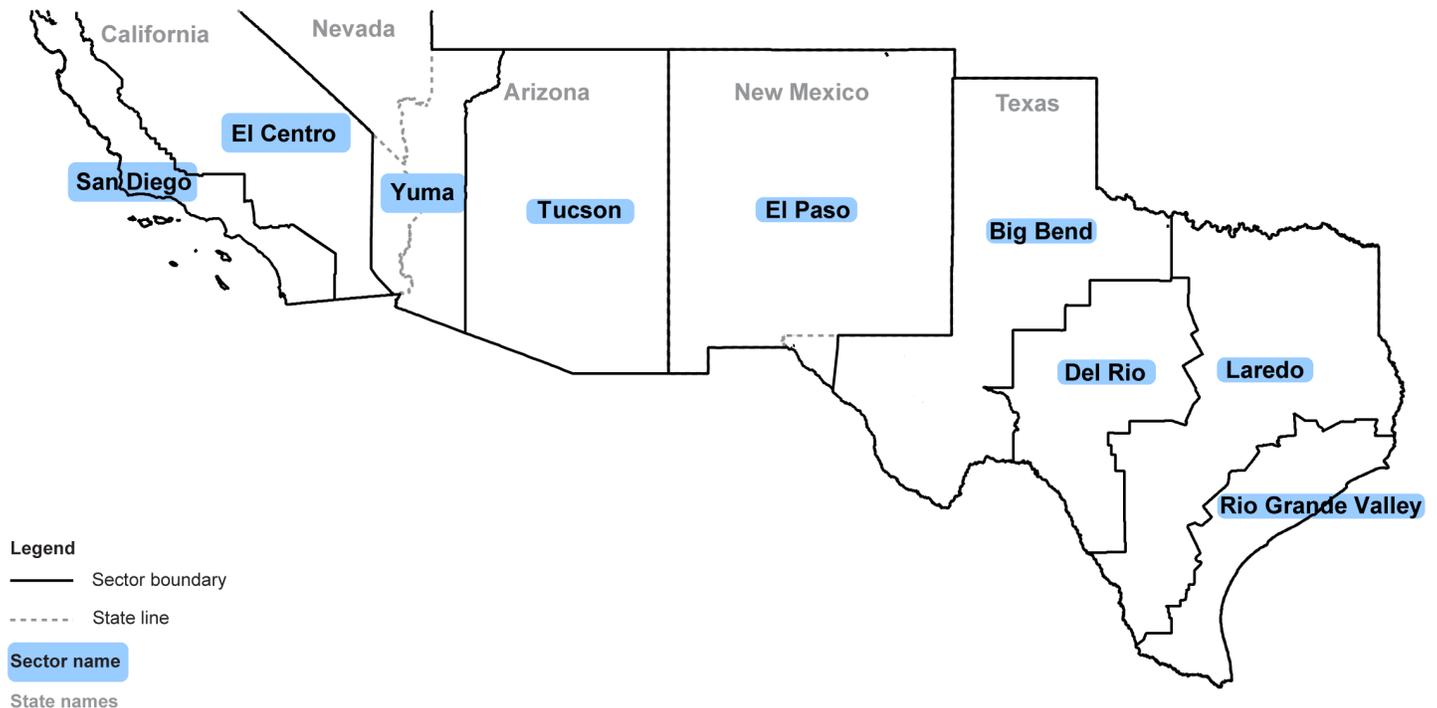
extent to which technologies have met requirements once deployed. We interviewed program officials from the Border Patrol's PMOD to determine what actions have been taken, or were planned, in order to address deficiencies identified in testing or raised by users for each technology. We also interviewed Border Patrol headquarters officials with responsibilities for collecting and using asset assist and other related data, including officials from the Strategic Planning and Analysis Directorate.

We conducted this performance audit from July 2016 to November 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.

Background

Border Patrol Organization Border Patrol has divided geographic responsibility for the southwest border among nine sectors, as shown in figure 1.

Figure 1: Border Patrol Sectors along the Southwest Border



Source: U.S. Border Patrol; MapInfo (map). | GAO-18-119

Each sector has a varying number of stations, which serve as bases of operation for agents, and agents are responsible for patrolling within defined geographic areas—known as areas of responsibility. Border Patrol uses a variety of land-based surveillance technologies under the Southwest Border Technology Plan to assist its efforts to secure the border by interdicting illicit cross-border activity and apprehending individuals attempting to cross the border illegally. Border Patrol is responsible for planning, acquiring, and deploying that technology along the southwest border. Border Patrol’s PMOD executes the acquisition and procurement of Border Patrol systems, supplies, and services, including current and planned technology deployments along the southwest border, which was previously conducted by CBP’s Office of Technology Innovation and Acquisition. CBP has an Office of Acquisitions that performs oversight.

Southwest Border Technology Plan

As noted above, the 2014 Southwest Border Technology Plan incorporated the 2011 Arizona Technology Plan and included plans to extend land-based surveillance technology deployments beyond Arizona to the remainder of the southwest border, beginning with selected areas in Texas and California. Border Patrol developed the Southwest Border Technology Plan using a two-step process. First, the Homeland Security Studies and Analysis Institute conducted an analysis of alternatives, which analyzed five technology options in 13 representative areas along the southwest border, identified the types of environmental conditions under which a given technology option might be more effective or less effective, and provided a general overview of the cost and effectiveness tradeoffs between the technologies.¹⁰ For example, the analysis of alternatives noted that IFTs are potentially effective if vegetation is sufficiently sparse and terrain is flat or rolling, such as in the Ajo station area of responsibility (see figure 2). However, according to Border Patrol officials, the IFT's radar capabilities may not be suited for urban environments, where illegal crossers and narcotics traffickers can blend in with the legitimate traffic. In some of these locations, such as the Nogales port of entry, Border Patrol has determined that the RVSS is more effective.

¹⁰Specifically, the analysis of alternatives examined (1) agent-centric technologies, such as binoculars; (2) Integrated Fixed Towers; (3) ground mobile systems, such as Mobile Video Surveillance Systems; (4) unmanned aircraft systems (remotely piloted aircraft equipped with video and radar surveillance technology); and (5) tethered aerostats (fixed-site, aerostat-based radar systems providing air surveillance).

Figure 2: Examples of Terrain in the Ajo Station and Nogales Station Areas of Responsibility



According to Border Patrol, Integrated Fixed Towers are well suited to the flat, rolling terrain of the Ajo station area of responsibility because of their long-range camera and radar capabilities.



The Integrated Fixed Tower radar capabilities may not be suited for urban environments, where illegal crossers and narcotics traffickers can blend in with the legitimate traffic. In some of these locations, such as the Nogales port of entry, Border Patrol has determined that the Remote Video Surveillance System is more effective.

Source: GAO. | GAO-18-119

Second, Border Patrol developed a technology deployment plan that identified the types and quantities of each technology needed for each sector. To develop this plan, Border Patrol officials reviewed the results of the analysis of alternatives and considered each sector's operational conditions, including patterns of traffic, terrain, infrastructure, weather, available resources, and challenges. For example, Border Patrol selected MSC units for Arizona's Tucson and El Centro sectors, but not for Texas's Rio Grande Valley sector because the radar was less effective in the dense vegetation of south Texas, an example of which is shown in figure 3.

Figure 3: Example of Dense Vegetation in the Rio Grande Valley Border Patrol Sector



Source: GAO. | GAO-18-119

Figure 4 shows the border surveillance technology systems included in the Southwest Border Technology Plan.

Figure 4: Border Surveillance Technology Systems in the Southwest Border Technology Plan



Integrated Fixed Towers (IFT)

The system consists of radar and daylight and infrared cameras mounted on 80- to 160-foot-tall fixed towers. Power generation and communications equipment are linked to a command and control center.



Unattended Ground Sensors and Imaging Sensors (UGS and I-UGS)

The system consists of ground sensors and cameras to detect, track, identify, and differentiate humans, animals, and vehicles. Communications equipment links information captured by the system to a command and control center and can link directly to border patrol agents.



Agent Portable Surveillance System (APSS)

The system consists of radar, daylight and infrared cameras, and a laser illuminator. It is portable and is intended for use in areas where Border Patrol cannot deploy truck-mounted mobile systems. The system does not link to a command and control center.



Thermal Imaging Device (TID)

The system consists of a portable, handheld infrared camera and corresponding remote viewing kit that enables Border Patrol agents to see clearly up to 5 miles in areas that are dimly lit or in total darkness. The system does not link to a command and control center.



Mobile Surveillance Capability (MSC)

The system consists of radar, daylight and infrared cameras, a laser range finder, and a laser illuminator mounted 25 feet high on a truck. Power generation and communications equipment link the information captured by the system to the control station located within the cab of the truck, not to a command and control center; the information is displayed on multiple monitors for the operator to view.



Remote Video Surveillance System (RVSS)

The system consists of multiple daylight and infrared cameras and a laser illuminator mounted on 30- to 90-foot-tall monopoles, 120-foot-tall fixed towers and buildings. Command and control center linked with communications equipment. Unlike IFT, RVSS does not include radar capability.



Relocatable RVSS

The system consists of multiple daylight and infrared cameras and a laser illuminator mounted on an 80-foot-tall tower, which is on a steel platform trailer and can be relocated to other sites. The system links to a modular command and control center.



Mobile Video Surveillance System (MVSS)

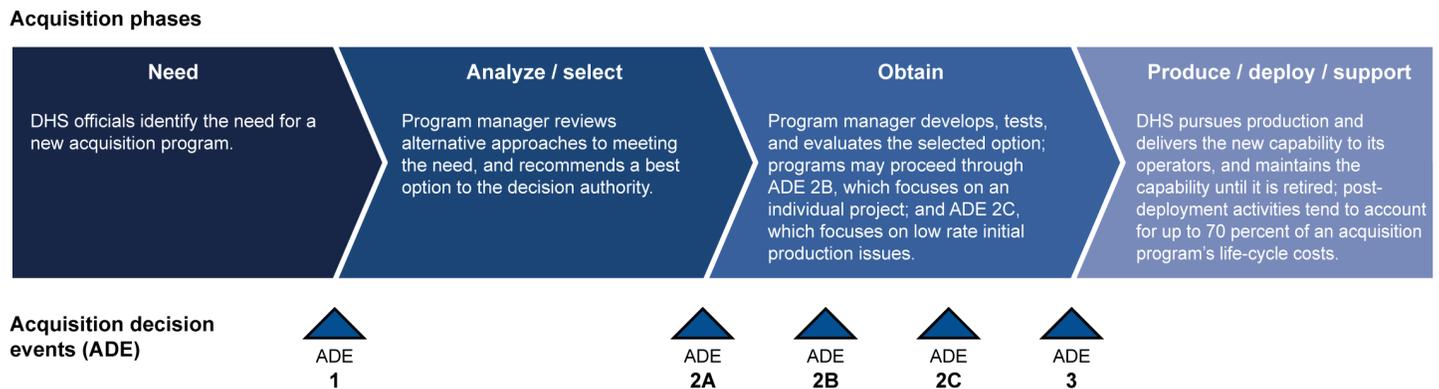
The system consists of a lift system that elevates daylight and infrared cameras, a laser range finder, and a laser illuminator. Power generation and communications equipment link the information captured by the system to the control station located within the cab of the truck, not to a command and control center; the information is displayed on a single monitor for the operator to view. Unlike MSC, MVSS does not include radar capability.

Source: GAO analysis of U.S. Customs and Border Protection (CBP) information; CBP (photos); GAO (photos). | GAO-18-119

DHS's Acquisition Life Cycle

Border Patrol follows DHS's acquisition policy to acquire planned technologies under the Southwest Border Technology Plan. DHS's overall policy for acquisition management is outlined in Acquisition Management Directive 102-01 and its associated Instructional Manual 102-01-001. DHS's Under Secretary for Management (USM) is currently designated as the department's Chief Acquisition Officer and, as such, is responsible for managing the implementation of the department's acquisition policies and acting as the acquisition decision authority for the department's largest acquisition programs.¹¹ Within DHS, the USM is supported by the Office of Program Accountability and Risk Management (PARM), which is responsible for overseeing the acquisition process and assessing the status of acquisition programs through four phases of the acquisition life cycle. These phases include a series of five Acquisition Decision Events (ADE) that provide the acquisition decision authority an opportunity to assess whether the program is ready to proceed through the acquisition life cycle phases. Figure 5 depicts the four phases of the acquisition life cycle and the associated ADEs.

Figure 5: Department of Homeland Security's (DHS) Acquisition Life Cycle and Acquisition Decision Events



Source: GAO analysis of Department of Homeland Security (DHS) data. | GAO-18-119

¹¹DHS's USM serves as the decision authority for programs with life-cycle cost estimates of \$300 million or greater. Component Acquisition Executives—the most senior acquisition management officials within each of DHS's component agencies—may be delegated decision authority for programs with cost estimates between \$300 million and less than \$1 billion and also serve as the decision authority for programs with cost estimates below \$300 million. DHS's USM is the decision authority for the IFT, RVSS, and MVSS programs; CBP's Component Acquisition Executive is the decision authority for Border Patrol's remaining surveillance technology programs.

In addition, components and program offices have established program-level groups, such as Executive Steering Committees, to provide, among other things, assistance and support during the acquisition process.

Border Patrol's Requirements Management Process

According to Border Patrol officials, in 2014, Border Patrol began implementing a new process to identify future technology needs. The Requirements Management Process (RMP), according to Border Patrol officials, is a new process designed to facilitate planning in order to fund and deploy operational capabilities, such as surveillance technology and tactical infrastructure, for border security operations. According to Border Patrol officials, Border Patrol will use information resulting from the RMP to fulfill DHS acquisition policy requirements, including information required for Acquisition Decision Events, as appropriate. Border Patrol is working to develop guidance to align the RMP with the DHS acquisition life cycle. The RMP consists of six steps as shown in figure 6.

Figure 6: U.S. Border Patrol's Requirements Management Process



Source: U.S. Border Patrol. | GAO-18-119

In the first step of the process, Border Patrol reviews strategic guidance to identify mission priorities and goals and assesses the state of the threat to be addressed. The second step, mission analysis, begins with the Capability Gap Analysis Process, which is intended to identify each station's capability gaps by determining the difference between a station's existing capabilities and the capabilities required to perform its mission-essential tasks. The identified shortfall in required capability is a capability gap. Under the RMP's third step—planning—Border Patrol officials examine capability gaps in detail and determine courses of action—that is, solutions, which may include surveillance technologies, to close the capability gaps. For example, potential solutions could include adjusting the technologies or personnel deployed in a specific area or improving maintenance and repair of access roads. The solutions are documented in sector-specific Initial Requirements Documents. The fourth step—execution—involves Border Patrol leadership executing courses of action. Border Patrol officials stated that courses of action are options for Border Patrol commanders and executives to select and implement. Certain courses of action, including acquiring and deploying land-based surveillance technology, may need to proceed through the DHS

acquisition life cycle as appropriate. Once implemented, these options are expected to resolve identified capability gaps in operations, according to Border Patrol officials. The fifth and sixth steps of the process—assessment and life-cycle management—involve implementing and monitoring solutions to determine their ability to resolve capability gaps, and gathering sector feedback on how the solutions affect border security operations.

CBP Has Made Progress Deploying Technology along the Southwest Border, and Is Still Developing Guidance for Future Planning Processes

Border Patrol Has Completed Deployment of Select Surveillance Technology to Arizona, Texas, California, and New Mexico, and Has Further Deployment Activities Underway

As of October 2017, Border Patrol had initiated or completed the planned deployment of select technologies to sectors across areas in Arizona, Texas, California, and New Mexico. In 2014, we reported that Border Patrol had made progress deploying technologies and had completed deployments for two technology programs in Arizona—the Agent Portable Surveillance System (APSS) and the Thermal Imaging Device (TID) technologies.¹² Since our 2014 report, Border Patrol has completed deployments of several additional technology programs. Specifically, according to Border Patrol officials, it has completed deployments of all planned RVSS, MSC, and Unattended Ground Sensors (UGS), as well as 15 of 53 IFT systems to Arizona.¹³ Border Patrol has also completed

¹²[GAO-14-368](#). According to CBP officials, APSS was considered a demonstration project and CBP plans to replace these units under a new program of record.

¹³The RVSS program consists of two parallel activities: (1) upgrade selected RVSS sites with newer technology and (2) construct new RVSS sensor sites and install the upgraded technology. Specifically, in Arizona, 47 planned surveillance tower sites are to be upgraded, 18 new towers are to be constructed, and 8 surveillance tower sites are to be relocated. In addition, 5 command and control stations are to be upgraded.

deployments of select technologies to Texas and California, including deploying 32 MSC systems to Texas and California.

Border Patrol also has efforts underway for completing deployments of other technology programs, but some of those programs have not yet begun deployment or are not yet under contract. For example, as of October 2017, Border Patrol had not yet initiated deployments of RVSS to Texas because, according to PMOD officials, the program had only recently completed contract negotiations for procuring those systems. According to PMOD officials responsible for the RVSS program, Border Patrol has begun planning the designs of the command and control centers and towers, as well as real estate needs for the Rio Grande Valley sector. Additionally, Border Patrol initially awarded the contract to procure and deploy MVSS units to Texas in 2014 but, because of bid and size protests, did not award the contract until 2015, and the vendor that was awarded the contract did not begin work until March 2016.¹⁴ The deployment status of surveillance technologies is shown in table 1.

¹⁴A bid protest, filed with GAO, is a dispute in which the protester alleges that a federal agency has not complied with statutes and regulations controlling government procurements. A size protest, filed with the Small Business Administration, is a challenge of the determination that an awardee of a small business set-aside contract meets the definition of "small business" in order to be eligible for the set-aside.

Table 1: Deployment Status of Surveillance Technology along the Southwest U.S. Border as of October 2017

Technology program	Location	Under contract	Deployment		
			Started	Completed	
Integrated Fixed Towers (IFT)	Arizona	X	X	—	Border Patrol has completed deployments of IFT systems to the Nogales and Douglas Border Patrol stations in Arizona. Border Patrol plans to deploy IFT systems at four additional stations— Sonoita, Casa Grande, Ajo, and Tucson. In January 2015, Border Patrol requested a scope change for the IFT program. Specifically, Border Patrol decided to deploy IFTs to replace the 15 existing Secure Border Initiative Network fixed-tower systems in the Tucson sector prior to the end of the latter systems' expected life cycle in 2020, rather than expanding IFT capabilities by deploying IFTs to a new area of responsibility at the Wellton station in Yuma, Arizona, as originally planned.
Remote Video Surveillance System (RVSS)	Arizona	X	—	X	In December 2016, Border Patrol completed deployments of all new and upgraded RVSS systems that it planned to deploy in Arizona and achieved full operational capability for the Arizona segment of the RVSS program. ^a The Arizona segment of the RVSS program is in the operations and sustainment part of the final phase of the acquisition life cycle.
	Texas–Rio Grande City and McAllen stations within the Rio Grande Valley sector	X (under the Arizona contract)	—	—	The 2013 Arizona contract includes options to expand RVSS into the Rio Grande Valley sector's eight Border Patrol stations. According to Border Patrol officials, current program funding allows for RVSS to be deployed in the McAllen and Rio Grande City Border Patrol stations. Border Patrol reported that the RVSS program is in the production part of the final phase of the acquisition life cycle and is completing planning for the deployment of RVSS systems to the Rio Grande Valley sector. Specifically, the program worked with Johns Hopkins University Applied Physics Laboratory to examine video field of view for potential RVSS sites. Border Patrol completed selections for site laydowns in April 2016.

Technology program	Location	Under contract	Deployment		
			Started	Completed	
	Texas (beyond the Rio Grande Valley sector) and California	—	—	—	Border Patrol made changes and modifications to the scope of the RVSS program and also plans to deploy RVSS to the remaining six southwest border sectors—Laredo, Del Rio, Big Bend, El Paso, El Centro, and San Diego. Border Patrol officials stated that the contract awarded in 2013 does not cover all of the remaining six sectors, and that all deployments outside of the Rio Grande Valley sector would be covered under a new contract, which Border Patrol expects to award by September 30, 2019, if funded.
Mobile Surveillance Capability (MSC)	Arizona, Texas, and California	X	—	X	Border Patrol reported that, as of December 2016, it had completed deployments of all MSC systems to Arizona, Texas (Big Bend, Del Rio, and El Paso sectors), and California (San Diego and El Centro sectors).
Mobile Video Surveillance System (MVSS)	Arizona	—	—	—	Border Patrol reported that current program funding does not allow for MVSS to be deployed in Arizona; however, officials stated that they have not removed the program from the plan because the system will be needed in Arizona in the future.
	Texas	X	—	—	Border Patrol plans to deploy 165 MVSS to sectors in Texas, beginning with 28 MVSS to the Rio Grande Valley sector. Border Patrol officials stated that Border Patrol conducted systems testing in June 2017. Program officials stated that the units did not meet the contract design requirements and Border Patrol was working with the vendor to repair or replace the units.
Agent Portable Surveillance System (APSS)	Arizona (demo program)	X	—	X	Border Patrol completed its APSS demonstration program in 2013. Border Patrol acquired 15 legacy APSS, all of which were initially deployed to the Tucson and Yuma sectors. Program officials stated that since then, one of those units was deployed to (and is currently being used by) the El Paso sector.
	Arizona, Texas, and California (program of record)	—	—	—	Border Patrol completed an analysis of alternatives for the new APSS program. Program officials stated that the program is awaiting further guidance regarding requirements from the Border Patrol. Border Patrol plans to procure 22 systems to be deployed along the southwest border, but funding is not available for the program.

Technology program	Location	Under contract	Deployment		
			Started	Completed	
Thermal Imaging Device (TID)	Entire Southwest Border	X	—	X	Border Patrol awarded a contract for thermal imaging equipment in August 2011 and all 22 units procured under the Arizona Technology Plan were deployed by October 2011. Border Patrol has reported that much of the thermal imaging equipment is either being replaced with new equipment or repaired. Border Patrol has acquired additional thermal imaging equipment through the Department of Defense's retrograde equipment distribution program to be deployed along the southwest border.
Unattended Ground and Imaging Sensors (UGS and I-UGS)	Entire Southwest Border	X (for UGS)	—	X	Border Patrol has completed deployments of UGS and I-UGS nationwide. In 2013, there were 362 I-UGS nationwide, 86 of which were deployed to the southwest border. Program officials reported that as of April 2017, 2,079 I-UGS were deployed nationwide, of which 1,118 were along the southwest border. Of these, about 600 were deployed to the Tucson and Yuma sectors. Program officials stated that they planned to procure additional sensors for sectors along the southwest border and that the deployments were prioritized based on various factors, such as shifting threat patterns.
Relocatable RVSS	Texas—Laredo-West and McAllen stations (pilot project)	X	—	—	Border Patrol reported it had initiated a pilot on the use of rapid deployment technologies (i.e., relocatable RVSS towers) in the McAllen and Laredo West stations. Border Patrol stated that the RVSS surveillance technology being used for the pilot is the same technology included in the 2013 Arizona RVSS contract. Border Patrol is currently deploying two pilot relocatable RVSS systems in Laredo-West and McAllen, Texas, and plans to assess the results of those pilots by the second quarter of fiscal year 2018.

Source: GAO analysis of U.S. Customs and Border Protection and U.S. Border Patrol data. | GAO-18-119

^aFull operational capability is the point at which the program delivers the entire capability to the user.

Border Patrol's Technology Programs Have Experienced Delays, but Are on Track against Revised Schedules and Cost Baselines

Border Patrol has revised schedules and cost estimates for its three highest-cost programs—IFT, RVSS, and MSC—and as of October 2017, is on track to meet those revised schedules and estimates; however, risks remain in Border Patrol's deployment efforts. Border Patrol has rebaselined (i.e., revised original schedule and cost goals) its three highest-cost programs—IFT, RVSS, and MSC—due to schedule, quantity, and cost estimating variances, among other changes to the programs' original plans.¹⁵ According to our cost and schedule assessment guides, while rebaselining can be beneficial for quickly identifying new variances, reporting a program's performance based on a rebaselined cost or schedule may not reflect the program's overall cost and schedule performance or timeline.¹⁶

Deployment Schedules

In March 2014, we reported that CBP had a deployment schedule for each of the seven technology programs planned for deployment at the time—IFT, RVSS, MSC, APSS, MVSS, TID, and UGS—and that four of the programs would not meet their originally planned completion dates.¹⁷ Specifically, we found that the three highest-cost programs (IFT, RVSS, and MSC) had experienced delays relative to their baseline schedules as of March 2013, which were current at the time of our review.¹⁸ We recommended that CBP ensure that scheduling best practices are applied to the IFT, RVSS, and MSC program schedules. DHS concurred with the recommendation and stated that CBP planned to apply scheduling best practices when revising the three programs' schedules. Based on our

¹⁵Rebaselining establishes new schedule, cost, or performance goals that DHS expects the program to meet. A program can be rebaselined for several reasons, such as revisions to the program's original configuration; a significant difference between the estimated cost to complete the program and the budget for remaining work; unrealistic schedule estimates or longer than expected activity durations; changes in risks associated with executing the program; and frequent or significant current or retroactive changes (e.g., data accuracy).

¹⁶GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: Mar. 2, 2009) and *GAO Schedule Assessment Guide: Best Practices for Project Schedules*, [GAO-16-89G](#) (Washington, D.C.: December 2015).

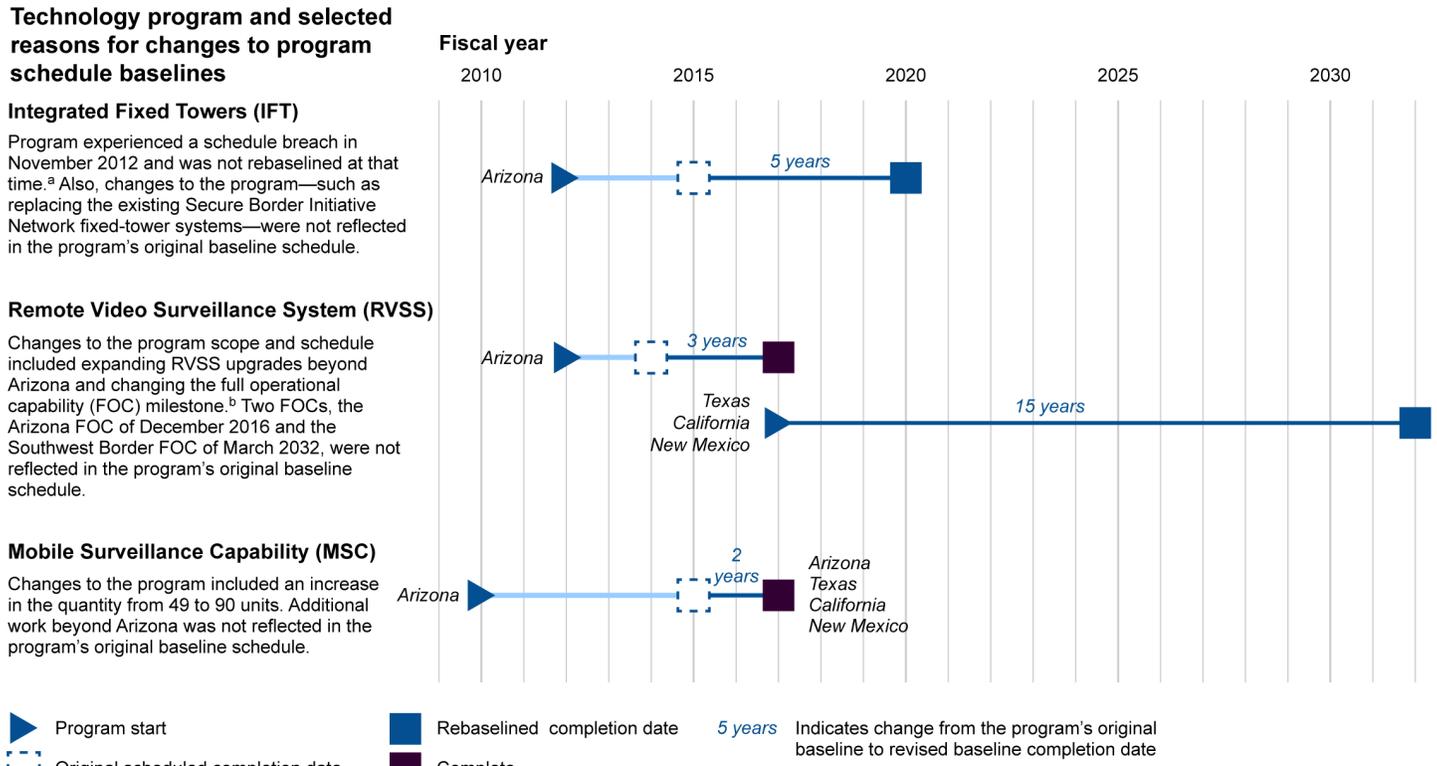
¹⁷[GAO-14-368](#).

¹⁸The original baseline schedule is to represent the original configuration of the program plan and signify the consensus of all stakeholders regarding the required sequence of events, resource assignments, and acceptable dates for key deliverables. The current schedule reflects updates of actual dates and schedule variances that occur; it represents the actual plan to date for tracking the progress of the program relative to its baseline schedule goals established in the program's plan.

assessment of the IFT, RVSS, and MSC programs' revised schedules that CBP had completed as of January 2017, CBP did not apply all scheduling best practices. However, the revised programs' schedules for the IFT, RVSS, and MSC reflect substantial improvements in quality and are consistent with the intent of our recommendation. In particular, CBP has improved the quality of its products for analyzing and quantifying risk to the programs' schedules. Continuing to apply scheduling best practices in future updates will help better position CBP to identify and address any potential delays in its programs' commitment dates.

DHS approved Border Patrol's rebaseline of the IFT program in December 2015, which extended the program's completion date to 2020—five years beyond what Border Patrol had estimated in its original baseline schedule. The RVSS and the MSC programs' completion dates were also extended because the scopes of the programs had increased, among other reasons. While Border Patrol's revisions to its schedules are positive steps in helping the agency oversee its management of these programs, the programs continue to be behind schedule relative to their original planned baseline documents dated March and September 2012 for the IFT and RVSS programs, respectively, as shown in figure 7.

Figure 7: Schedule Changes for Rebaselined Highest-Cost Southwest Border Technology Programs



Source: GAO analysis of U.S. Customs and Border Protection and U.S. Border Patrol data. | GAO-18-119

Notes: Rebaselining establishes new schedule, cost, or performance goals that the program is expected to meet. Programs can be rebaselined for several reasons, such as revisions to the program’s original scope; a significant difference between the estimated cost to complete the program and the budget for remaining work; unrealistic schedule estimates or longer than expected activity durations; changes in risks associated with executing the program; and frequent or significant current or retroactive changes (e.g., data accuracy).

^aBreaches occur when a program fails to meet any cost, schedule, or performance threshold in the approved Acquisition Performance Baseline, which documents the cost, schedule, and performance goals of the program.

^bFull operational capability is the point at which the program delivers the entire capability to the user.

Life-Cycle Cost Estimates

In addition to revising program schedules, Border Patrol has revised the life-cycle cost estimates for the three highest-cost programs to reflect actual costs and include cost estimates for additional and ongoing work. For example, the MSC cost estimate increased by \$294.7 million—from \$107.2 million to \$401.9 million—due to, among other reasons, the program’s expanded scope to Texas, California, and New Mexico. In December 2015, estimated life-cycle costs for the IFT program decreased from its original March 2012 baseline estimate by \$211.5 million, in part

because of lower-than-expected contract costs. However, from March 2012 to December 2015, IFT's acquisition cost threshold increased by more than \$50 million—from \$288 million to \$341 million—when CBP included the costs of contractor personnel supporting the program office, the cost of replacing SBInet systems, and actual costs through fiscal year 2014, rather than estimates. According to Border Patrol officials, a CBP policy change required them to include the contractor personnel support costs in the rebaseline, which was previously not required in the original cost baseline. Figure 8 shows original and revised cost estimates for the IFT, RVSS, and MSC programs.

Figure 8: Life-Cycle Cost Estimate (LCCE) Changes for Rebaselined Highest-Cost Southwest Border Technology Programs

Technology program	Initial program cost estimate (millions)	Number of units planned/deployed	Primary reason or examples of reasons for increase or decrease in program baseline costs
Integrated Fixed Towers (IFT)	2012  \$960.8	In 2012, Border Patrol planned deployments of 50 IFT units and in 2013 it requested a scope change for the IFT program and reduced the number of planned IFT units to 38. In January 2015, it increased IFT units to 53. As of September 2017, program officials said they had deployed 15 out of the 53 units planned for delivery to Arizona.	Reflects a decrease due in part to lower-than-expected contract costs in the initial program cost estimate. The rebaselined program cost estimate reflects actual costs, not estimated costs through fiscal year 2014. It includes costs associated with changes to the program, such as replacement of the 15 Secure Border Initiative Network fixed-tower systems.
	2015  \$749.3		
Remote Video Surveillance System (RVSS)	2012  \$287.5 <i>Arizona only</i>	In 2012, Border Patrol planned deployments for 18 new RVSS units and 41 upgrades to existing RVSS units across areas in Arizona. In 2016, Border Patrol increased the number of RVSS upgrades from 41 to 47 in Arizona, and 486 RVSS units to be deployed to Texas, California, and New Mexico. As of September 2017, program officials said they had deployed all RVSS units planned for delivery to Arizona and were working on deployment plans for Texas, California, and New Mexico.	Reflects an increase, due in part to schedule delays and changes to the program's scope in Arizona; and cost estimates associated with deploying RVSS units to seven additional sectors across areas in Texas, California, and New Mexico.
	2017  \$2,798.3		
Mobile Surveillance Capability (MSC)	2013  \$107.2 <i>Arizona only</i>	In 2013, Border Patrol planned to deploy 49 MSC units to Arizona. In 2014, Border Patrol increased planned MSC deployments from 49 to 90 units to Texas, California, and New Mexico. As of September 2017, program officials said they had deployed all MSC units planned for delivery to Arizona, Texas, California, and New Mexico.	Reflects an increase, due in part to program scope changes and changes in program management and systems engineering costs associated with the planning and acquisition phases, and actual costs associated with the operations and maintenance of the systems not included in the original estimate. ^a
	2017  \$401.9 <i>Arizona, Texas, California, and New Mexico</i>		

 Initial program cost estimate (dollars in millions)
 Rebaselined program cost estimate (dollars in millions)

Source: GAO analysis of U.S. Customs and Border Protection and U.S. Border Patrol data. | GAO-18-119

Note: The initial program cost data and rebaselined cost data for each program are represented in then-year dollars.

^aThe MSC contract was awarded to two contractors. The MSC cost data is only for units purchased from one contractor.

In March 2014, we reported that the three highest-cost programs (IFT, RVSS, and MSC) accounted for 97 percent of the Arizona Technology Plan's estimated cost and that the life-cycle cost estimates for the two highest-cost programs—IFT and RVSS—reflected some, but not all, best practices for cost estimating.¹⁹ Reliable life-cycle cost estimates reflect four characteristics—they are (1) well-documented, (2) comprehensive, (3) accurate, and (4) credible. Our analysis of CBP's estimates for the two highest-cost programs at the time of our March 2014 review showed that these estimates at least partially met three of these characteristics: well-documented, comprehensive, and accurate. In terms of being credible, these estimates had not been verified with independent cost estimates in accordance with best practices. We concluded that verifying life-cycle cost estimates with independent estimates in accordance with cost-estimating best practices could help better ensure the reliability of the cost estimates. We recommended that CBP verify the life-cycle cost estimates for the IFT and RVSS programs with independent cost estimates and reconcile any differences. DHS concurred with this recommendation, but stated then that it did not believe there would be a benefit from expending funds to obtain independent cost estimates and that if the costs realized to date continued to hold, there may be no requirement or value added in conducting full program updates with independent cost estimates.

As part of our updates on CBP's efforts to implement our 2014 recommendations, CBP officials told us that in fiscal year 2016, DHS's Cost Analysis Division (CAD) would begin piloting its own independent cost estimate capability with the RVSS program. According to CBP officials, this pilot was an opportunity to assist DHS in developing its independent cost estimate capability. CBP selected the RVSS program for the pilot because the program was at a point in its planning and execution process where it could benefit most from having an independent cost estimate performed, as these technologies were being deployed along the southwest border beyond Arizona. According to CBP

¹⁹To compare the cost estimates, we used leading government and industry practices as discussed in [GAO-09-3SP](#) and Office of Management and Budget, Capital Programming Guide, Supplement to Office of Management and Budget Circular A-11, Part 7: Preparation, Submission, and Execution of the Budget (Washington, D.C.: Executive Office of the President, June 2006). Specifically, the methodology outlined in the Cost Estimating and Assessment Guide is a compilation of best practices that federal cost-estimating organizations and industry use to develop and maintain reliable cost estimates throughout the life of an acquisition program. We did not analyze a life-cycle cost estimate for the MSC program because CBP had not completed one as of March 2014.

officials, CAD completed its independent cost estimate for the RVSS program in August 2016. CBP officials also told us that the RVSS life-cycle cost estimate was finalized and reconciled in March 2017. CBP reported that the component acquisition executive approved the reconciliation estimate in September 2017. According to CBP officials, CBP does not have plans to conduct an independent cost estimate and verification for the IFT. We continue to believe that independently verifying the life-cycle cost estimate for the IFT program and reconciling any differences, consistent with best practices, could help CBP better ensure the reliability of the estimate.

Risks Affecting Schedule and Cost Goals

While selected technology programs are on track to meet schedule and cost goals, according to Border Patrol officials, some programs have identified risks that may lead to schedule slips or cost growth in the future. Specifically, Border Patrol has experienced delays in completing deployments for planned technologies due to (1) land use and access-related issues; (2) technical issues; and (3) contracting challenges, among other factors. For instance, the IFT program continues to experience delays deploying IFTs to tribal lands in the Tucson sector in Arizona. Border Patrol officials stated that the IFT program has not received authorization from tribal land leaders to build an access road and deploy IFT tower systems on the tribe's land. They also stated that the historic preservation officer for the tribal lands would need to issue a finding that the IFT would not have any negative impact on cultural resources before Border Patrol could proceed with deployment. In addition, RVSS program officials we met with noted that access to privately owned land is an issue of concern in Texas that could potentially delay RVSS deployment for the Rio Grande Valley sector. Border Patrol has also encountered delays in the IFT program as a result of technical issues identified during delivery of the IFT. For example, we previously reported that testing completed in November 2015 on IFT systems in Nogales had been delayed by 2 months in order for the contractor to address issues related to IFT cameras and operator interfaces.²⁰ Additionally, Border Patrol has encountered schedule delays due to contracting challenges, such as renegotiations with the contractor after the contract was awarded. For example, according to Program officials, the MVSS contractor proposed a technical change to the system to

²⁰*Homeland Security Acquisitions: Earlier Requirements Definition and Clear Documentation of Key Decisions Could Facilitate Ongoing Progress*, [GAO-17-346SP](#) (Washington, D.C.: Apr. 6, 2017).

address safety and maintenance concerns. Border Patrol agreed to the change, which led to delays.

We have previously reported that program delays can result in increased costs and force agents to rely on legacy surveillance technologies.²¹ According to Border Patrol officials, program managers and Border Patrol are working to mitigate the risk of delays through quarterly executive steering committee meetings of program managers and representatives from other component and headquarters offices, such as DHS's PARM. During these meetings, program managers discuss cost and schedule risks and evaluate options for mitigating those risks. For example, according to PARM officials, at one such meeting, officials reviewed the RVSS program and determined that it met cost criteria to receive additional DHS oversight. According to Border Patrol officials, Border Patrol has also used quarterly executive steering committee meetings to involve stakeholders and address potential risks as it moves forward with full production in the IFT program. As Border Patrol proceeds with these programs, it will be important to continue to find ways to mitigate the risk of delays in order to meet its revised schedules.

Border Patrol Is Developing Guidance to Help Sectors Identify and Plan for Future Technology Needs and Deployments

Border Patrol's RMP and other initiatives are intended to help inform future technology deployment decisions, but, as we reported in February 2017, additional actions are needed to ensure station officials understand the process and their respective roles and responsibilities. Border Patrol officials reported that the Southwest Border Technology Plan is the baseline for identifying technology needs and planning technology deployments, and that changes to the plan are needed as threats and priorities evolve. To help address these changes and remain adaptive, in 2014, Border Patrol began implementing the RMP that, among other things, is intended to identify capability gaps in border security operations and identify solutions to those capability gaps.

In February 2017 we found that Border Patrol had documented the RMP, but had not developed written guidance on how officials were to use the information and analyses resulting from the process when requesting tactical infrastructure—that is, fencing, gates, roads, bridges, lighting, and

²¹U.S. Customs and Border Protection's *Border Security Fencing, Infrastructure and Technology Fiscal Year 2010 Expenditure Plan*, [GAO-10-877R](#) (Washington, D.C.: July 30, 2010) and [GAO-12-22](#).

drainage infrastructure—for deployment purposes.²² For example, we reported that sectors varied in their understanding of how to use results from the Capability Gap Analysis Process when engaging in planning processes or when making resource allocation decisions. We recommended that Border Patrol develop and implement written guidance for the steps within its requirements process for identifying, funding, and deploying tactical infrastructure for border security operations, including clarifying the roles and responsibilities of the parties involved in the RMP.

In response to our recommendation, Border Patrol officials reported that they are currently updating the RMP documentation, training, and guidance to the field. Border Patrol officials expect to have an updated Internal Operating Procedure and Manual for the RMP by the second quarter of fiscal year 2018. According to CBP officials, actions taken in response to our recommendation would apply to surveillance technology as well—not solely tactical infrastructure. By developing this written guidance, Border Patrol intends to reduce the risk of relevant agency officials not having the information needed to perform their appropriate role in the process. We will continue to monitor the progress of Border Patrol efforts related to the RMP to determine whether these actions meet the intent of our recommendation to fully develop and implement written guidance for the steps within the RMP. Until then, Border Patrol is less likely to have reasonable assurance that it has the best available information to inform future investments in surveillance technologies and resource allocation decisions among surveillance technologies.

In addition to the RMP, future surveillance technology deployments will be affected by other ongoing DHS and CBP initiatives. Specifically, Border Patrol officials in the Strategic Planning and Analysis Division reported that the Domain Awareness: Land Surveillance initiative requirements documents and Southwest Border Capability Roadmap will also be taken into consideration throughout the RMP and will influence future surveillance technology deployments. CBP's Domain Awareness: Land Surveillance initiative is intended to depict current CBP land domain awareness capabilities and inform future capabilities, which could help Border Patrol identify solutions during various phases of the RMP. Border Patrol officials stated that Border Patrol, with CBP's Air and Marine Operations and U.S. Immigration and Customs Enforcement, is

²²GAO, *Southwest Border Security: Additional Actions Needed to Better Assess Fencing's Contributions to Operations and Provide Guidance for Identifying Capability Gaps*, [GAO-17-331](#) (Washington, D.C.: Feb. 16, 2017).

developing mission needs statements, concepts of operations, and capability operational requirements documents for (1) mobile, (2) fixed and relocatable, and (3) agent-portable capabilities which will help inform future technology deployments. Border Patrol also proposed a Southwest Border Capabilities Roadmap in April 2017 to assist with identifying solutions, such as surveillance technology, mobility and access, and personnel. This roadmap is intended to inform a balanced, risk-based investment strategy driven by capability gaps, geographic priorities, terrain, and other environmental factors, and to consider the evolving cross-border threat. The roadmap identifies specific requirements for persistent surveillance assets, such as RVSS, and was used to support CBP's fiscal year 2018 budget justification for RVSS deployments in the Rio Grande Valley sector. To create this roadmap, Border Patrol officials reported reaching out to stations within 40 miles of the border to discuss their current gaps and how they would close them (either through physical barriers, manpower, or technology). Because Border Patrol is still in the planning phases for future technology deployments, it is too soon to tell how these efforts will assist Border Patrol in structuring and planning those deployments.

CBP Is Taking Action to Better Link Performance Data to Planning Efforts, but Needs to Improve Data Quality

Border Patrol Has Made Progress Identifying Performance Metrics for Technologies

Border Patrol has made progress identifying performance metrics for the technologies under the Southwest Border Technology Plan, but additional actions are needed to fully implement our prior recommendations in this area.²³ In November 2011, we found that CBP did not have the information needed to fully support and implement the ATP and recommended that CBP (1) determine the mission benefits to be derived from implementation of the ATP and (2) develop and apply key attributes for metrics to assess program implementation. We reported in 2014 that,

²³[GAO-12-22](#), [GAO-14-368](#).

in response to our recommendations, CBP had identified mission benefits expected from the implementation of the surveillance technologies under the ATP, but had not fully developed key attributes for performance metrics for the technologies. We recommended, among other things, that CBP analyze available data on apprehensions and seizures and technological assists, in combination with other relevant performance metrics or indicators, to determine the contribution of surveillance technologies to CBP's border security efforts.²⁴ CBP officials stated that they planned to develop objectives for each performance measure, at which time the agency would begin using the data to evaluate the contributions of specific technology assets. CBP also intended to establish a tool by the end of fiscal year 2016 that explained the qualitative and quantitative impacts of technology and tactical infrastructure on situational awareness in specific areas of the border environment.²⁵

In September 2016, Border Patrol provided us a case study that assessed technology assist data, along with other measures, to determine the contributions of surveillance technologies to its mission. In April 2017, we reported that this was a helpful step in developing and applying performance metrics; however, the case study was limited to one border location and the analysis was limited to select technologies.²⁶ In May 2017, Border Patrol officials demonstrated the agency's new Tracking, Sign Cutting, and Modeling (TSM) system, which they said is intended to connect between agents' actions (such as identification of a subject with a camera) and results (such as an apprehension) and allow for more comprehensive analysis of the contributions of surveillance technologies to Border Patrol's mission. One official said that data from the TSM will have the potential to provide decision makers with performance indicators, such as changes in apprehensions or traffic before and after technology deployments. However, the TSM is still early in its use and officials confirmed that it is not yet used to support such analytic efforts. The official stated that over time it would be used to analyze performance on a systematic basis and provide information to decision makers. We continue to believe that it is important for Border

²⁴[GAO-14-368](#).

²⁵[GAO-16-465T](#).

²⁶GAO, *2017 Annual Report: Additional Opportunities to Reduce Fragmentation, Overlap, and Duplication and Achieve Other Financial Benefits*, [GAO-17-491SP](#) (Washington, D.C.: April 2017).

Patrol to assess technologies' contributions to border security and will continue to monitor the progress of the TSM and other Border Patrol efforts to determine whether these actions sufficiently meet the intent of our November 2011 recommendation to fully develop and apply performance metrics for its border technologies. Until then, Border Patrol is not well positioned to fully assess its progress in implementing the Southwest Border Technology Plan and determine when mission benefits have been fully realized.

Border Patrol Measures Technologies' Assistance in Apprehensions and Seizures, but Data Are of Limited Quality and Usability

Border Patrol agents collect and report data on asset assists, which are instances in which technologies or other assets (such as canine teams, bicycle patrols, or air support from CBP's Air and Marine Operations) contributed to an apprehension or seizure; however, the agency does not have sufficient controls to ensure the accuracy and reliability of that data. In March 2014, we reported that CBP was not capturing complete asset assist data on the contributions of its surveillance technologies to apprehensions and seizures and that Border Patrol agents were not consistently recording these data across locations.²⁷ We recommended that CBP require data on asset assists to be recorded and tracked within the DHS Enforcement Integrated Database (EID), which contains data on apprehensions and seizures. Since then, Border Patrol has taken actions to better record asset assists and to expand the types of technologies that can be tracked, consistent with our prior recommendation. Specifically, in June 2014, Border Patrol issued guidance informing agents that the asset assist data field within the e3 Portal to the EID had become a mandatory data field.²⁸ Additionally, when recording asset assists, agents initially could only choose from "camera," "mobile surveillance system," "scope truck," "unattended ground sensor," or "other" when selecting technologies. In May 2016, Border Patrol expanded the types of assets available for agents to choose from to include MSC, IFT, and APSS, among others.

Border Patrol requirements for entering asset assist data into the e3 Portal and expansion of the types of assets listed have been positive steps to help better position Border Patrol to assess the contributions of

²⁷ [GAO-14-368](#).

²⁸ The e3 is CBP's portal for collecting and transmitting biographic, encounter, and biometric data to the EID for identification and verification of individuals encountered at the border.

surveillance technologies to border security efforts, as we recommended in 2014. However, we have identified issues with the completeness and reliability of the asset assist data. In particular, we analyzed data on asset assists from October 1, 2014 through May 3, 2017 and our analysis showed that agents incorrectly attributed some apprehensions and seizures to certain technologies rather than others. For example, stations in the Rio Grande Valley sector recorded assists from IFTs in nearly 500 instances from June through September 2016, which cannot be accurate, since the sector does not have IFTs. When we brought this issue to the attention of Border Patrol headquarters officials, they told us in December 2016 that they would discuss the matter with Rio Grande Valley sector officials. However, data from December 2016 through May 3, 2017 indicated that agents in the Rio Grande Valley sector continued to record asset assists from IFTs. Additionally, we found that one station in the Tucson sector with SBInet towers was recording asset assists from the SBInet towers as “other,” when Border Patrol headquarters officials told us that SBInet towers should be recorded as “IFT.” Moreover, our analysis showed that “other” (including “other” listed alongside additional assets) made up nearly 16 and 23 percent, respectively, of asset assists recorded in the Tucson and Rio Grande Valley sectors from October 1, 2016 through May 3, 2017.²⁹ Border Patrol officials told us that “other” should be any technology not otherwise listed, and could include technologies or support that officials were interested in tracking locally. Officials said the large number of “other” assets could also be a result of agents not understanding their responsibilities or agents working to complete the asset assist data entry as quickly as possible so they could move on to other duties.

According to Border Patrol officials, data integrity and quality checks are the responsibility of the individual sectors, and each station has a designated point of contact for data integrity and a system administrator to oversee data quality. However, Border Patrol has not provided written guidance to the sectors on how to oversee data integrity or conduct quality checks of asset assist data, and Border Patrol’s guidance on how to enter asset assist data is limited. According to Border Patrol officials, Border Patrol’s asset assist guidance for sectors consists of two training presentations. We reviewed the training slides for these presentations

²⁹As of May 3, 2017, we calculated this percentage by looking at those asset assists where “other” was recorded as the sole asset or as the primary asset (but not where “other” was recorded as a secondary or tertiary asset). This method may underrepresent the true number of instances in which stations recorded “other” assets.

and found they included photographs and general descriptions of some technologies, along with two case examples for recording an asset assist. However, the slides did not discuss how sectors should conduct data integrity or quality checks. Furthermore, the slides did not address how agents should record assists for SBInet towers. The slides also did not explain why asset assist data are collected (other than that the Chief of the Border Patrol requires it), what it could be used for, or why it was important to ensure data were accurately recorded. Officials told us in June 2017 that the asset assist data were only used to respond to data requests from external agencies—the data were not being used for planning, budgeting, performance measurement, or other purposes.

Standards for Internal Control in the Federal Government states that management should obtain relevant data from reliable internal and external sources in a timely manner based on the identified information requirements.³⁰ Reliable internal and external sources provide data that are reasonably free from error and bias and faithfully represent what they purport to represent. Management should evaluate both internal and external sources of data for reliability. Additionally, management should periodically review policies, procedures, and related control activities for continued relevance and effectiveness in achieving the entity's objectives or addressing related risks. If there is a significant change in the entity's process (such as the addition of new asset assist fields), management should review this process in a timely manner to determine that the control activities are designed and implemented accordingly. Without sufficient guidance for sectors on how to enter and review asset assist information, Border Patrol does not have reliable data on asset assists that could help monitor the contribution of surveillance technologies to Border Patrol apprehensions and seizures and inform resource allocation decisions.

Border Patrol Reviews Agent Feedback Data on Technology Performance to Improve Current and Future Deployments

Border Patrol has a variety of mechanisms for collecting agent feedback on technology performance and for using that information to improve current and future deployments. For example, officials from the Border Patrol Program Management Office Directorate (PMOD) reported that they conduct required technology performance evaluations at specified intervals (e.g., a 6-month post-deployment review and an annual operational analysis) to regularly collect and evaluate agent feedback,

³⁰[GAO-14-704G](#).

and conduct monthly reviews of maintenance and repair requests.³¹ Officials said that this feedback is consolidated, prioritized based on cost effectiveness, and used to identify system upgrades (both for systems that have been deployed and for future deployments).

The PMOD also collects feedback as part of the annual process for developing an operational analysis report.³² In the 2016 operational analysis for the MSC program, the PMOD assessed Border Patrol agents' overall satisfaction with the MSC system, whether it enabled agents to perform their functions more easily and efficiently, and whether it met agents' needs. Agents identified several MSC benefits, including performance improvements from the prior system (known as the Mobile Surveillance System), radars that exceeded the performance of other mobile systems' radars, and targets being detected at farther ranges than the system specification. However, the analysis identified more opportunities for improvement, including the need for improvements to the MSC's camera, video analytics, tracking, graphical user interface, engineering, and other changes.

Border Patrol also reported using post-implementation reviews to collect agent feedback and identify improvements.³³ For technologies under the ATP and Southwest Border Technology Plan, Border Patrol completed post-implementation reviews for the MSC in July and October of 2014, for the IFT in June 2016, and for the RVSS in October 2016. In August 2017, Border Patrol reported expecting to conduct reviews for the remaining technologies within 6 to 18 months of each technology reaching initial operating capability. A post-implementation review's primary purpose is to determine the impact of the system on stakeholders, quantitative and qualitative performance of the system, and the ability of the system to meet identified goals. For example, the MSC review from October 2014 reported that the system was generally an improvement over the older Mobile Surveillance System; however, program risks included damage to

³¹A post-implementation review and an annual operational analysis are conducted for information technology projects in accordance with DHS policy.

³²DHS operational analysis reports include investment information, financial performance analysis, user assessment results, and operational performance measures, among other things.

³³DHS requires that a post-implementation review be conducted 6 to 18 months after a system is deployed. This review documents deployment or implementation and coordination issues, how they were resolved, and how they could be prevented in the future.

trucks and sensors from Border Patrol agent operator error and the need to improve or widen access roads given the larger footprint of the MSC trucks (compared to the prior Mobile Surveillance System trucks). The review concluded with six recommendations to improve future assessments of the system and to plan for new sensor deployments. The recommendations to the PMOD and Border Patrol acquisition office included updating the life-cycle cost estimate to track manpower costs; using a skills-based qualification standard for MSC operators; and ensuring future Border Patrol surveillance systems include the ability to extract actual performance, operational, and environmental data. In August 2017, Border Patrol reported a range of actions underway to address these recommendations, including (1) developing updates to the MSC's support system to better capture all service requests and maintenance work orders, (2) providing standardized training to each MSC operator with refresher training available upon request, and (3) updating key acquisition documents to reflect the increase in the number of MSCs to a full operating capability of 90 units.

In addition to required reports, PMOD officials reported gathering agent feedback directly. For example, a PMOD official with responsibility for the IFT program reported conducting feedback meetings with agents. The meetings included both contractors and government personnel in order to ensure a shared understanding of agent-identified issues. The PMOD also reported conducting weekly, monthly, and real-time monitoring of trouble-tickets—that is, agent-generated reports of maintenance or other technical issues. PMOD officials reviewed the issues identified and prioritized them based on cost and the potential increases in capability. For issues beyond contractual requirements, the PMOD vets the requests and forwards them to senior Border Patrol leadership for approval and funding.

Conclusions

Since 2005, Border Patrol has spent more than one billion dollars deploying technologies to the southwest border, but is not yet positioned to fully quantify the impact these technologies have on its mission. We continue to believe that developing and applying performance metrics for its border technologies, in accordance with our prior recommendation, would help Border Patrol more fully assess its progress in implementing the Southwest Border Technology Plan and determine when mission benefits have been realized. Border Patrol has taken some steps toward tracking the performance of its surveillance technologies, including requiring agents to record when technologies assist in an apprehension or seizure. However, additional guidance to better ensure the quality of

these data (including agent training and managerial review), would help Border Patrol determine the mission benefits of its surveillance technologies, which in turn could be used to inform Border Patrol's resource allocation decisions.

Recommendations for Executive Action

The Chief of the Border Patrol should issue guidance for sectors to improve the quality and usability of its surveillance technology asset assist information to help ensure it has reliable data so that Border Patrol can be better positioned to measure the impact of these technologies on its border security efforts and inform future investments.
(Recommendation 1)

Agency Comments

We provided a draft of this report to DHS for review and comment. DHS provided written comments, which are summarized below and reproduced in full in appendix I. DHS also provided technical comments, which we incorporated as appropriate. DHS concurred with our recommendation and described actions planned to address it. Specifically, DHS stated that Border Patrol will revise its training presentation concerning asset assists to include additional information on how sectors should conduct asset assist data integrity checks, why the data are collected, how the data can be used, and why Border Patrol needs to ensure asset assist data are accurately recorded. Border Patrol also plans to prepare and release a video concerning asset assists for all field office personnel. Border Patrol plans to complete these actions by February 28, 2018.

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. GAO staff who made key contributions to this report are listed in appendix II.



Rebecca Gambler
Director, Homeland Security and Justice

Appendix I: Comments from the Department of Homeland Security

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



**Homeland
Security**

November 13, 2017

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

Re: Management Response to Draft Report GAO-18-119, "SOUTHWEST BORDER SECURITY: Border Patrol Is Deploying Surveillance Technologies but Needs to Improve Data Quality and Assess Effectiveness"

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 work of the U.S. Government Accountability Office (GAO) in planning and conducting its review and issuing the report.

The Department is pleased to note GAO's positive recognition of U.S. Border Patrol's (Border Patrol) progress in deploying technology to support border security operations along the southwest U.S. border. The Border Patrol has made marked improvements in its ability to collect data and is continually striving to improve the accuracy of the data collected. The Border Patrol is committed to ensuring the quality of data it collects for use in assessing the utility and effectiveness of technology, informing future investments, and properly equipping Border Patrol agents.

The draft report contained one recommendation, with which DHS concurs. Attached is our detailed response to the recommendation.

Again, thank you for the opportunity to 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,

A handwritten signature in black ink, appearing to read "Jim H. Crumacker".

JIM H. CRUMACKER, CIA, CFE

Director

Departmental GAO-OIG Liaison Office

Attachment

**Attachment: Management Response to the Recommendation
Contained in GAO-18-119**

GAO recommended that the Chief of the Border Patrol:

Recommendation: Issue guidance for sectors to improve the quality and usability of its surveillance technology asset assist information to help ensure it has reliable data so that Border Patrol can be better positioned to measure the impact of these technologies on its border security efforts and inform future investments.

Response: Concur. The Border Patrol will revise its training presentation concerning asset assists to include: how sectors should conduct data integrity checks; why data is collected; how data can be used; and, why the Border Patrol needs to ensure data is accurately recorded. The Border Patrol will request agents read, and initial to confirm understanding of the revised material. In addition, the Border Patrol will prepare and release a video from the Border Patrol Communications Division concerning asset assists. The intent of the video will be to provide all field office personnel with a full understanding of asset assists. The video will be disseminated via the Border Patrol's Information Display System.
Estimated Completion Date: February 28, 2018

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Rebecca Gambler, gablerr@gao.gov, (202) 512-8777

Staff Acknowledgments

In addition to the contact named above, Jeanette Henriquez (Assistant Director), Ashley Davis, Charlotte Gamble, Yvette Gutierrez, Eric Hauswirth, Nancy Kawahara, Marycella Mierez, Sasan J. “Jon” Najmi, and Claire Peachey made key contributions to this report.

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