

GAO

Report to the Ranking Member,  
Committee on Transportation and  
Infrastructure, House of  
Representatives

May 2010

# AVIATION SECURITY

## Efforts to Validate TSA's Passenger Screening Behavior Detection Program Underway, but Opportunities Exist to Strengthen Validation and Address Operational Challenges



GAO

Accountability \* Integrity \* Reliability



Highlights of [GAO-10-763](#), a report to the Ranking Member, Committee on Transportation and Infrastructure, House of Representatives

## Why GAO Did This Study

To enhance aviation security, the Transportation Security Administration (TSA) began initial testing in October 2003 of its Screening of Passengers by Observation Techniques (SPOT) program. Behavior Detection Officers (BDO) carry out SPOT's mission to identify persons who pose a risk to aviation security by focusing on behavioral and appearance indicators. GAO was asked to review the SPOT program. GAO analyzed (1) the extent to which TSA validated the SPOT program before deployment, (2) implementation challenges, and (3) the extent to which TSA measures SPOT's effect on aviation security. GAO analyzed TSA documents, such as strategic plans and operating procedures; interviewed agency personnel and subject matter experts; and visited 15 SPOT airports, among other things. Although the results from these visits are not generalizable, they provided insights into SPOT operations.

## What GAO Recommends

GAO recommends that TSA, among other things, use an independent panel of experts to assist in validating SPOT, enhance SPOT data collection and analysis, fully utilize TSA resources to identify possible threats, and establish a plan to develop more outcome-oriented measures for SPOT. DHS reviewed a draft of this report and generally concurred with our recommendations although its plans do not fully address one of our recommendations.

View [GAO-10-763](#) or [key components](#). For more information, contact Stephen M. Lord at (202) 512-4379 or [lords@gao.gov](mailto:lords@gao.gov).

## AVIATION SECURITY

### Efforts to Validate TSA's Passenger Screening Behavior Detection Program Underway, but Opportunities Exist to Strengthen Validation and Address Operational Challenges

#### What GAO Found

Although the Department of Homeland Security (DHS) is in the process of validating some aspects of the SPOT program, TSA deployed SPOT nationwide without first validating the scientific basis for identifying suspicious passengers in an airport environment. A scientific consensus does not exist on whether behavior detection principles can be reliably used for counterterrorism purposes, according to the National Research Council of the National Academy of Sciences. According to TSA, no other large-scale security screening program based on behavioral indicators has ever been rigorously scientifically validated. DHS plans to review aspects of SPOT, such as whether the program is more effective at identifying threats than random screening. Nonetheless, DHS's current plan to assess SPOT is not designed to fully validate whether behavior detection can be used to reliably identify individuals in an airport environment who pose a security risk. For example, factors such as the length of time BDOs can observe passengers without becoming fatigued are not part of the plan and could provide additional information on the extent to which SPOT can be effectively implemented. Prior GAO work has found that independent expert review panels can provide comprehensive, objective reviews of complex issues. Use of such a panel to review DHS's methodology could help ensure a rigorous, scientific validation of SPOT, helping provide more assurance that SPOT is fulfilling its mission to strengthen aviation security.

TSA is experiencing implementation challenges, including not fully utilizing the resources it has available to systematically collect and analyze the information obtained by BDOs on passengers who may pose a threat to the aviation system. TSA's Transportation System Operations Center has the resources to investigate aviation threats but generally does not check all law enforcement and intelligence databases available to it to identify persons referred by BDOs. Utilizing existing resources would enhance TSA's ability to quickly verify passenger identity and could help TSA to more reliably "connect the dots." Further, most BDOs lack a mechanism to input data on suspicious passengers into a database used by TSA analysts and also lack a means to obtain information from the Transportation System Operations Center on a timely basis. TSA states that it is in the process of providing input capabilities, but does not have a time frame for when this will occur at all SPOT airports. Providing BDOs, or other TSA personnel, with these capabilities could help TSA "connect the dots" to identify potential threats.

Although TSA has some performance measures related to SPOT, it lacks outcome-oriented measures to evaluate the program's progress toward reaching its goals. Establishing a plan to develop these measures could better position TSA to determine if SPOT is contributing to TSA's strategic goals for aviation security. TSA is planning to enhance its evaluation capabilities in 2010 to more readily assess the program's effectiveness by conducting statistical analysis of data related to SPOT referrals to law enforcement and associated arrests.

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### Abbreviations

AMRA	Aviation Modal Risk Assessment
BDO	Behavior Detection Officer
CBP	U.S. Customs and Border Protection
DEA	Drug Enforcement Agency
DHS	Department of Homeland Security
FAMS	Federal Air Marshal Service
FBI	Federal Bureau of Investigation
ICE	U.S. Immigration and Customs Enforcement
LEO	Law Enforcement Officer
NCIC	National Crime Information Center
NIPP	National Infrastructure Protection Plan
OMB	Office of Management and Budget
SOP	Standard Operating Procedures
SPOT	Screening of Passengers by Observation Techniques
S&T	Science and Technology Directorate
TSA	Transportation Security Administration
TSO	Transportation Security Officer

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United States Government Accountability Office  
Washington, DC 20548

May 20, 2010

The Honorable John L. Mica  
Ranking Member  
Committee on Transportation and Infrastructure  
House of Representatives

Dear Mr. Mica:

The terrorist attacks of September 11, 2001, highlighted the need to improve security within the nation's civil aviation system to deter persons seeking to repeat similar attacks on the nation's critical infrastructure. In October 2003, the Transportation Security Administration (TSA) of the Department of Homeland Security (DHS) conducted an operational test of the use of behavior detection techniques to screen passengers in an airport environment, and subsequently began training certain Transportation Security Officers (TSO)—TSA employees responsible for screening passengers and their property—in these techniques. These TSOs performed behavior observation as a collateral duty. Beginning in fiscal year 2007, TSA created separate Behavior Detection Officer (BDO) positions as part of the Screening of Passengers by Observation Techniques (SPOT) program.<sup>1</sup> According to TSA, the SPOT program is a derivative of other behavioral analysis programs that have been successfully employed by law enforcement and security personnel both in the United States and around the world, particularly that of Israel's airline, El Al.<sup>2</sup>

TSA designed SPOT to provide BDOs with a means of identifying persons who may pose a potential security risk at TSA-regulated airports<sup>3</sup> by focusing on behaviors and appearances that deviate from an established

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<sup>1</sup>BDOs must have at least 12 months experience as a TSO, or related security work experience, and must pass a BDO training course.

<sup>2</sup>TSA cautions that the applicability of El Al's security processes to those used by TSA is constrained by differences in the scale of El Al's worldwide operations and the flexibilities that El Al has in implementing security processes compared to constraints on TSA. For example, El Al security screeners are encouraged to spend as much time with passengers as needed, and are not concerned whether passengers experience delays in boarding an aircraft.

<sup>3</sup>For the purposes of this report, the term "TSA-regulated airport" refers to a U.S. airport operating under a TSA-approved security program.

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baseline, and that may be indicative of stress, fear, or deception. Passengers in an airport terminal, including those waiting in security checkpoint lines, are observed by the BDOs to determine if their behavioral and appearance indicators—which are assigned varying points by SPOT—have (in combination) exceeded a predetermined numerical threshold. In cases where the passenger exceeds the threshold, the passenger is referred for additional screening by BDOs and a TSO. During this referral screening, if the passenger exhibits behaviors that exceed another numerical threshold, they are to be referred to a law enforcement officer (LEO) for further investigation. In addition to observing passengers at airport checkpoints, BDOs may patrol throughout an airport terminal, and sometimes participate in other activities, such as TSA’s Visible Intermodal Prevention and Response team operations. These teams are responsible for periodically augmenting security at air and ground transportation facilities around the country.<sup>4</sup>

As of March 2010, TSA deployed about 3,000 BDOs at an annual cost of about \$212 million; this force increased almost fifteen-fold between March 2007 and July 2009. BDOs have been selectively deployed to 161 of the 457 TSA-regulated airports in the United States at which passengers and their property are subject to TSA-mandated screening procedures.<sup>5</sup> The conference report accompanying the fiscal year 2010 DHS appropriations act provided that \$211.9 million of aviation security funding was for the SPOT program.<sup>6</sup> The administration has requested \$232 million for SPOT for fiscal year 2011, a \$20.2 million (9.5 percent) increase over the current funding level. This increase would support a workforce increase from about 3,000 to 3,350 BDOs. If this funding request is approved and maintained, SPOT would cost about \$1.2 billion over the next 5 years.

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<sup>4</sup>Visible Intermodal Prevention and Response teams are comprised of federal air marshals, surface transportation security inspectors, TSOs, BDOs, and canines.

<sup>5</sup>TSA classifies its regulated airports in the United States into one of five categories—X, I, II, III, and IV. Generally, category X airports have the largest number of passenger boardings and category IV airports have the least.

<sup>6</sup>See H.R. Rep. No. 111-298 at 77 (2009) (Conf. Rep.). The conference report directed TSA to report, no later than 60 days after enactment, on the scientific basis for using behavior pattern recognition for observing airline passengers for signs of hostile intent, the effectiveness of the SPOT program in meeting its goals and objectives, and the justification for expanding the program. The conference report also directed us to review this report and to provide our findings to the Committees no later than 120 days after the TSA report is submitted. TSA completed its report to Congress on March 15, 2010.

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You asked us to address SPOT's development and implementation. This report addresses the following questions:

1. To what extent did TSA determine whether SPOT had a scientifically validated basis for identifying passengers before deploying it and utilize recognized best practices during SPOT's development?
2. What management challenges, if any, have emerged during the implementation of SPOT at the nation's airports?
3. To what extent has TSA measured SPOT's effect on aviation security?
4. To what extent has TSA incorporated the attributes of an effective training program into the training for SPOT?

This report is a public version of the restricted report (GAO-10-157SU) that we provided to you on May 14, 2010. DHS and TSA deemed some of the information in the restricted report as sensitive security information, which must be protected from public disclosure. Therefore, this report omits this information. Although the information provided in this report is more limited in scope, it addresses the same questions as the restricted report. Also, the overall methodology used for both reports is the same.

To determine the extent to which TSA determined whether SPOT had a scientifically validated basis for identifying passengers who may pose a risk to aviation security before deploying it, we reviewed literature on behavior analysis by subject matter experts, and analyzed relevant reports and books on the topic. These included a 2008 study by the National Research Council of the National Academy of Sciences that included a discussion section on deception and behavioral surveillance, as well as other issues related to behavioral analysis.<sup>7</sup> We interviewed seven recognized experts in the field, and an expert on emergency responses to terror attacks and mathematical models in operations management.<sup>8</sup> Although the views of these experts cannot be generalized across all experts on behavior analysis, because we selected these individuals based on their publications on behavioral analysis or related topics, their recognized accomplishments and expertise, and, in some cases, TSA's use of their work or expertise to design and review the SPOT program's

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<sup>7</sup>National Research Council, *Protecting Individual Privacy in the Struggle Against Terrorists: A Framework for Assessment* (Washington, D.C.: National Academies Press, 2008). We reviewed the approach used and the information provided in this study and found the study and its results to be reliable for the purposes for which we used it in this report.

<sup>8</sup>See app. I for additional information on the experts we interviewed.

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behaviors, they provided us with an understanding of the fundamentals of behavior analysis, and its use in airports. We also interviewed cognizant officials from other U.S. government agencies that utilize behavior analysis in their work, including U.S. Customs and Border Protection (CBP), the U.S. Secret Service, the Federal Air Marshall Service (FAMS), and the Federal Bureau of Investigation (FBI).<sup>9</sup> To better understand how SPOT incorporated expertise on behavior analysis for aviation security, we also interviewed current and retired officials of Israel's El Al Airlines, whose security processes TSA cites as providing part of the basis of the SPOT program.<sup>10</sup>

To determine to what extent TSA utilized best practices during SPOT's development—including carrying out a comprehensive risk assessment, a cost-benefit analysis, and a strategic plan—we interviewed program officials and reviewed related program documentation, including briefings used in the course of developing and fielding SPOT, strategic plans, and standard operating procedures.<sup>11</sup> We compared these documents to DHS's 2006 *Cost Benefit Analysis Guidebook*,<sup>12</sup> Office of Management and

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<sup>9</sup>For reasons of scope, we did not assess the scientific basis of the methods and processes used by these agencies in their application of behavioral detection.

<sup>10</sup>Although SPOT is based in some respects on El Al's aviation security program, El Al's processes differ in substantive ways from those used by the SPOT program. In particular, El Al does not use a list of specific behaviors with numerical values for each, or a numerical threshold to determine whether or not to question a passenger; rather, El Al security officers utilize behavioral indicators as a basis for interviewing all passengers boarding El Al passenger aircraft, and accessing relevant intelligence databases, when deemed appropriate. In addition, El Al officials told us that they train all their personnel—not just security officers—in elements of behavior analysis, and conduct covert tests of their employees' attentiveness at frequent intervals. According to these officials, El Al also permits what is termed "profiling," in which passengers may be singled out for further questioning based on their nationality, ethnicity, religion, appearance, or other ascriptive characteristics, but these are not the only basis on which a passenger may be questioned. In addition, El Al security officers are empowered to bar any passenger from boarding an aircraft. The scale of El Al operations is considerably smaller than that of major airlines operating within the United States. As of 2008, El Al had a fleet of 34 aircraft. In Israel, El Al operates out of one hub airport, Ben-Gurion International, and also flies to Eilat, a city in southern Israel; in contrast, there are 457 TSA-regulated airports in the United States. In 2008, El Al had passenger boardings of about 3.6 million; in contrast, Southwest Airlines alone flew about 102 million passengers in the same year.

<sup>11</sup>Unless otherwise noted in the report, we refer to the SPOT strategic plan issued in March 2007.

<sup>12</sup>DHS, *Cost Benefit Analysis Guidebook* (Washington, D.C.: Feb. 1, 2006).

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Budget (OMB) guidance,<sup>13</sup> and DHS's 2006 and 2009 National Infrastructure Protection Plans (NIPP), which set forth a risk management framework to guide security decision making and resource allocation decisions, and our previous work on the characteristics of an effective strategic plan.

To identify any challenges that emerged during implementation of the SPOT program, we conducted field site visits to 15 TSA-regulated airports with SPOT that represent almost 10 percent of the 161 TSA-regulated airports with SPOT to observe operations and meet with key program personnel.<sup>14</sup> We chose airports with high, medium, and low passenger volume; airports with BDOs who are TSA (i.e., government) employees and an airport with BDOs employed by contractors as part of the TSA Screening Partnership Program; and airports with LEOs who were identified by TSA as having received some form of behavior detection training and airports where they were not known to have received such training.<sup>15</sup> We also selected airports on the basis of TSA's assessment of which ones are at highest risk of attack by terrorists, including the 2 that ranked the highest, as reported in TSA's Current Airport Threat Assessment.<sup>16</sup> Since the airports we selected range broadly in terms of passenger volume, physical size and layout, geographic location, and potential value as a target for terrorism, among other things, the results from these visits are not generalizable to other airports. However, these visits provided helpful insights into the operation of SPOT at airports. In addition, to determine whether challenges emerged in implementing SPOT, we compared TSA's approach for implementing and managing

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<sup>13</sup>OMB, Circular No. A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (Washington, D.C.: October 1992); Circular No. A-4, *Regulatory Analysis* (Washington, D.C.: Sept. 2003).

<sup>14</sup>See app. I for additional details on the airports we visited.

<sup>15</sup>At airports participating in TSA's Screening Partnership Program, private-sector contractors perform screening activities, including SPOT, in accordance with TSA requirements and oversight. See 49 U.S.C. § 44920. Unless otherwise specified, references to TSOs include private-sector contract screeners. For more information, see GAO, *Aviation Security: Progress Made to Set Up Program Using Private-Sector Airport Screeners, but More Work Remains*, [GAO-06-166](#) (Washington, D.C.: Mar. 31, 2006).

<sup>16</sup>The TSA Current Airport Threat Assessment is a threat estimate designed to provide a snapshot of the current terrorist threat to airports in the United States as well as for major international airports serving as last points of departure for U.S. airlines.

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SPOT to our *Standards for Internal Control in the Federal Government*<sup>17</sup> and to risk management principles we had previously identified.<sup>18</sup> In reviewing TSA's approach to developing and implementing SPOT, we considered relevant laws, regulations, and other materials, including those related to privacy, such as TSA's Privacy Impact Assessments. To obtain comparative data on how SPOT had been implemented at different airports across the nation, we conducted a survey of all Federal Security Directors responsible for security operations at TSA-regulated airports with SPOT.<sup>19</sup> (This accounted for all 161 TSA-regulated airports with SPOT because a single Federal Security Director may be responsible for several airports.) We obtained a 100 percent response rate. This survey asked, among other things, about the relationship between LEOs and the airport authority and BDOs. In addition, to understand the interaction of BDOs and LEOs, as well as other SPOT implementation issues, at each of the 15 TSA-regulated airports we visited we spoke with BDO managers, Federal Security Directors, Assistant Federal Security Directors, 1 or 2 BDOs, and 1 or 2 LEOs.

To determine the extent to which TSA has measured SPOT's effect on aviation security, we obtained and analyzed the TSA SPOT referral database,<sup>20</sup> which aims to record all incidents in which passengers who have passed through the checkpoint are sent to SPOT referral screening for additional questioning and screening of property and person. The database also maintains records of instances where passengers were referred by a BDO to a LEO for questioning. We assessed the reliability of the SPOT referral data by (1) performing electronic testing of required data elements, (2) reviewing existing information about the data and the

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<sup>17</sup>GAO, *Standards for Internal Controls in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

<sup>18</sup>See GAO, *Risk Management: Further Refinements Needed to Assess Risks and Prioritize Protective Measures at Ports and Other Critical Infrastructure*, [GAO-06-91](#) (Washington, D.C.: Dec. 15, 2005) and *Transportation Security: Comprehensive Risk Assessments and Stronger Internal Controls Needed to Help Inform TSA Resource Allocation*, [GAO-09-492](#) (Washington, D.C.: Mar. 27, 2009).

<sup>19</sup>Federal Security Directors are the highest ranking TSA officials responsible for security operations at TSA-regulated airports. See 49 U.S.C. § 44933. They and their assistants coordinate with both federal and nonfederal entities present at their airports, including the FAMS, the Drug Enforcement Administration, and CBP. When appropriate, Federal Security Directors may bar an individual from boarding an aircraft.

<sup>20</sup>The SPOT referral data we analyzed covered the period May 29, 2004, through August 31, 2008. These were the data available at the time of our analysis.

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system that produced them, and (3) interviewing agency officials knowledgeable about the data. We found a number of problems related to how the data were collected and recorded that are discussed later in this report. As a result, we were unable to use the SPOT referral data to assess whether any behavior or combination of SPOT behaviors could be used to reliably predict the final outcome of an incident involving the use of SPOT. However, with the stated limitations in mind, and after resolving certain contradictions and anomalies in the database, we utilized the SPOT referral data to provide examples of information used by TSA to report on the program's performance, including a count of arrests and the reasons for those arrests. In addition, to determine if individuals who were later charged with or pleaded guilty to terrorism-related offenses had transited SPOT airports and whether TSA could obtain information from these transits to enhance its understanding of terrorist behaviors, we reviewed CBP and Department of Justice information to (1) identify individuals who were charged with or pleaded guilty to terrorism-related offenses and (2) determine if these individuals had, prior to being charged, transited airports where SPOT had been deployed. Further, we used our survey of Federal Security Directors at SPOT airports to determine the extent to which video surveillance cameras, which could make video recordings of terrorists transiting airports, are present at checkpoints.

To assess the extent that SPOT training incorporates the attributes of an effective training program, we had TSA training experts complete a training assessment tool that we developed using guidance we prepared in our previous work for assessing training courses and curricula.<sup>21</sup> To better understand how other entities train their employees in behavior detection, and what their curricula include, we conducted site visits to the Secret Service, CBP, FAMS, and the FBI, and also interviewed nongovernmental experts on aspects of behavior detection training. We interviewed BDOs and BDO managers about the SPOT training. In addition, we interviewed El Al officials with regard to how El Al trains and tests its personnel in behavior recognition and analysis. Appendix I contains additional details about our scope and methodology.

We conducted this performance audit from May 2008 through May 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain

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<sup>21</sup>GAO, *Human Capital: A Guide for Assessing Strategic Training and Development Efforts in the Federal Government*, [GAO-04-546G](#) (Washington, D.C.: Mar. 1, 2004).

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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.

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## Background

The Aviation and Transportation Security Act established TSA as the federal agency with primary responsibility for securing the nation's civil aviation system, which includes the screening of all passenger and property transported by commercial passenger aircraft.<sup>22</sup> TSA currently has direct responsibility for, or oversees the performance of, security operations at approximately 457 TSA-regulated airports in the United States implementing security requirements in accordance with TSA-approved security programs and other TSA direction.<sup>23</sup> At TSA-regulated airports, prior to boarding an aircraft, all passengers, their accessible property, and their checked baggage are screened pursuant to TSA-established procedures, which include, for example, passengers passing through security checkpoints where they and their identification documents are checked by TSOs and Travel Document Checkers, or by Screening Partnership Program employees.

TSA uses multiple layers of security to deter, detect, and disrupt persons posing a potential risk to aviation security. These layers include three principal types of screening employees at airport checkpoints—Travel Document Checkers, who examine tickets, passports, and other forms of identification; TSOs, who examine property, including checked baggage, and persons using x-ray equipment and magnetometers, as well as other devices; and BDOs, using SPOT to assess passenger behaviors and appearance.<sup>24</sup> BDOs are the only type of TSA screening employees not deployed to all TSA-regulated airports and all checkpoints within the

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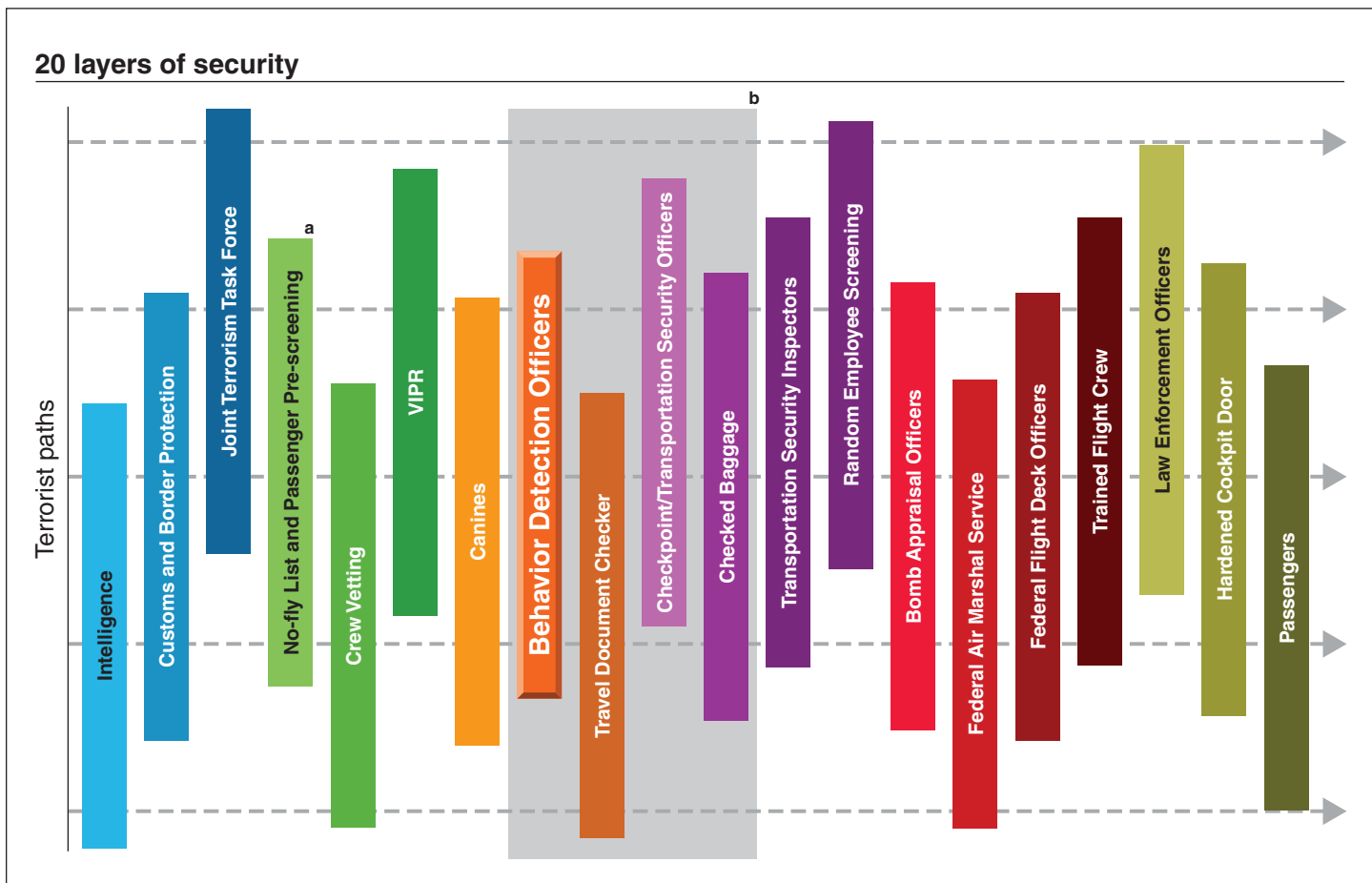
<sup>22</sup>See Pub. L. No. 107-71, 115 Stat. 597 (2001). For purposes of this report, "commercial aircraft" refers to a U.S. or foreign-based air carrier operating under TSA-approved security programs with regularly scheduled passenger operations to or from a U.S. airport.

<sup>23</sup>See 49 C.F.R. pt. 1542. Some commercial airports with fewer than 2,500 annual enplanements (passengers boarding an aircraft) do not have TSA-approved screening processes. Enplanements are the number of paying passengers on a scheduled or nonscheduled (charter) flight. Infants and airline personnel are not included. A stop at an airport is not considered an enplanement if the passenger does not transfer aircraft.

<sup>24</sup>Private-sector screeners under contract to and overseen by TSA, and not TSOs, perform screening activities at airports participating in TSA's Screening Partnership Program. See 49 U.S.C. § 44920.

airports where it is deployed on a regular basis. TSA deployed SPOT as an added layer of security to help deter terrorists attempting to exploit TSA's focus on prohibited items and other potential security weaknesses. Other security layers cited by TSA include intelligence gathering and analysis; passenger prescreening; random canine team searches at airports; federal air marshals; reinforced cockpit doors; federal flight deck officers; the passengers themselves; as well as other measures both visible and invisible to the public. Figure 1 shows TSA's 20 aviation security layers.

**Figure 1: TSA's Layers of Aviation Security**



Source: TSA.

<sup>a</sup>The No-Fly List is used to identify individuals who should be prevented from boarding an aircraft; it contains applicable records from the FBI's Terrorist Screening Center consolidated database of known or suspected terrorists.

<sup>b</sup>The four layers inside the grey bar are screening layers of security applied to passengers and their property.

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The grey area in figure 1 highlights four layers that apply to passengers and their property as they seek to board an aircraft. Airport LEOs, another layer of security cited by TSA, do not report to TSA and may not maintain a physical presence at smaller TSA-regulated airports. According to TSA, each one of these layers alone is capable of stopping a terrorist attack. In combination, TSA states that their security value is multiplied, creating a much stronger system, and that a terrorist who has to overcome multiple security layers in order to carry out an attack is more likely to be preempted, deterred, or to fail during the attempt.

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### SPOT Uses Behavior Detection Techniques to Assess Passenger Behaviors and Appearances

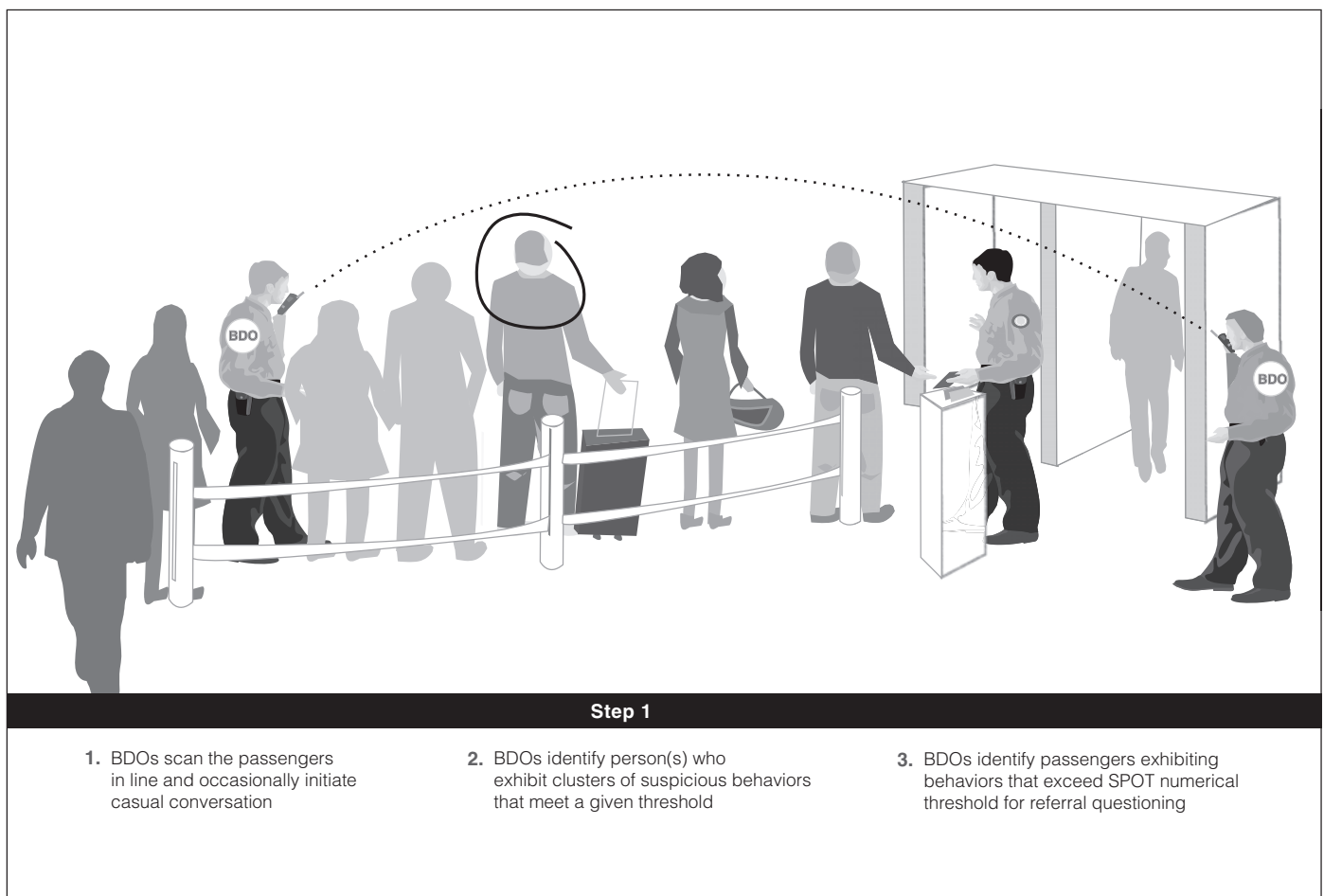
The SPOT program utilizes behavior observation and analysis techniques to identify potentially high-risk passengers. Individuals who exhibit suspicious behaviors, including both physical and appearance indicators, may be required to undergo additional screening. Field agents and law enforcement officers of other federal agencies and entities—such as the FBI, the Secret Service, CBP, and FAMS—utilize elements of behavior detection analysis as a part of their work. In addition, some foreign entities, such as Israel’s El Al airlines, use behavior detection and analysis techniques as part of their security efforts. However, TSA emphasized to us that the SPOT program is unique among these entities because it uses a point system to help identify suspicious persons on the basis of their behavior and appearance and because behavior detection and analysis are the central focus of SPOT. Officials from the other agencies stated that their field personnel incorporate behavior detection as one of many skills used in their work; in contrast, behavior detection is the primary element of the BDOs’ work.

SPOT trains BDOs to look for and recognize facial expressions, body language, and appearance that indicate the possibility that an individual is engaged in some form of deception and fears discovery. These behaviors and appearances are listed on a SPOT score sheet used in SPOT training.

Passenger behavior and appearance are to be compared by the BDOs—who typically work in two-person teams. BDOs are expected to “walk the line”—that is, to initiate casual conversations with passengers waiting in line, particularly if their observations led them to question someone exhibiting behaviors or appearances on the SPOT checklist. As the BDOs walk the line, and the passenger with SPOT indicators is reached, a casual conversation is used to determine if there is a basis for observed behaviors or appearances on the checklist. In most instances, these conversations provide information to the BDOs that permits them to consider the issue resolved, and hence not a security concern. Figure 2 below illustrates the

first step of the three-step SPOT process, the BDO-passenger interaction at a checkpoint prior to the passenger passing through a magnetometer.

**Figure 2: The First Step in the SPOT Process: BDOs Observing Passengers About to Go Through Checkpoint Magnetometer**



Sources: GAO (analysis), ArtExplosion (clip art), TSA (data).

Note: Circle around passenger shows a person who is exhibiting a cluster of suspicious behaviors.

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As shown in figure 2, passenger behavior and appearance are observed by the BDOs as passengers wait in line for screening at a security checkpoint. Even if the checkpoint is busy, the BDOs must attempt to visually scan all the passengers waiting in line, as well as persons near the checkpoint, to determine if any are showing behaviors or appearances on the SPOT checklist. According to TSA, on average a BDO has approximately 30 seconds to assess each passenger while the passenger waits in line. For passengers exhibiting indicators above baseline conditions, the BDOs are to (mentally) add up the points assigned to each indicator they observe. Both BDO team members must agree that observed indicators have exceeded the predetermined numerical threshold, although they do not have to identify the same indicators the passenger exhibited. In instances when a passenger's SPOT indicators place them above the numerical threshold, and the passenger has placed their property on the conveyor belt for x-raying, and has walked through the magnetometer or equivalent screening device for passengers, he or she will be directed to the second step of SPOT, referral screening. This involves additional questioning and physical search of their person and property by BDOs and TSOs. This referral screening occurs in the checkpoint area.

If the passenger's behavior escalates further—accumulating more points based on the SPOT checklist—the BDOs are to refer the passenger to a LEO. A referral to a LEO is a potential third step in the SPOT process. BDOs are not LEOs—they do not conduct criminal investigations, carry weapons, or make arrests.

After a passenger has been referred by the BDOs to a LEO, the LEO is then expected to independently determine, through additional investigation, such as questioning the passenger and, if appropriate, by conducting an identity verification and background check through the FBI's National Crime Information Center (NCIC), whether sufficient grounds exist to take further action, such as detaining or arresting the passenger. TSA officials who are LEOs also have access to NCIC, such as an airport's Assistant Federal Security Director for Law Enforcement or federal air marshals. NCIC is the FBI's computerized index of criminal justice information (i.e., criminal record history information, fugitives, stolen properties, and missing persons), available to federal, state, and local law enforcement

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and other criminal justice agencies at all times.<sup>25</sup> Similarly, other federal LEOs also have such access, including CBP, and Drug Enforcement Agency (DEA) personnel. However, since both local and federal LEOs have other responsibilities, and may not be present at each operating checkpoint, BDOs may have to seek them out to request an NCIC check. According to TSA, aside from requiring that an airport maintain a law enforcement presence,<sup>26</sup> it exercises no jurisdiction over the law enforcement activities of non-TSA officers or entities at an airport; thus, it cannot require LEOs to conduct an NCIC check or to provide BDOs with information about the ultimate disposition of cases referred by them to LEOs.

Once the LEO concludes his or her investigation and determines whether the passenger will be arrested or detained, TSA officials are to evaluate the security concerns to determine whether to allow the passenger to proceed to the boarding gate. (In some instances, a LEO might choose not to arrest or detain a passenger; TSA would then decide whether the infraction was sufficiently serious to necessitate barring the passenger from boarding.) After a referral incident has been resolved, BDOs are to enter information about the incident into TSA's SPOT referral database. The data entered are to include time, date, location of the incident, behaviors witnessed, prohibited items found (if any), and information on the LEO's response (if applicable), such as whether the LEO questioned the passenger, arrested the individual, or released the passenger. The SPOT referral database contains no personal identifying information about passengers.

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## SPOT Has Been Deployed in Phases

The SPOT program began with pilot tests in 2003 and 2004 at several New England airports, in which TSA began using uniformed BDOs at airport checkpoints. After some initial pilot projects and test deployments, 644

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<sup>25</sup>These requests would typically be made to the law enforcement entity employing the LEO, such as the airport authority police department. The department would have a computer that can access NCIC. According to the FBI's website, the NCIC database consists of 19 files or databases. Seven are property files which contain records for articles, boats, guns, license plates, securities, vehicles, and vehicle and boat parts. Twelve are person files are the Convicted Sexual Offender Registry, Foreign Fugitive, Identity Theft, Immigration Violator, Missing Person, Protection Order, Supervised Release, Unidentified Person, U.S. Secret Service Protective, Violent Gang and Terrorist Organization, and Wanted Person Files. The Interstate Identification Index, which contains automated criminal history record information, is also accessible through the same network as NCIC. The Violent Gang and Terrorist Organization file includes the names of known or suspected terrorists.

<sup>26</sup>See 49 CFR §§ 1542.215, .217.

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BDOs were deployed to 42 airports in the first phase of the program from November 2006 through June 2007. As of March 2010, about 3,000 BDOs utilizing SPOT were deployed at 161 of 457 TSA-regulated airports.<sup>27</sup>

BDO eligibility is restricted to TSOs with at least 12 months of TSO experience, or others with related security experience. Applicants must apply and be accepted into the BDO training program. The training includes 4 days of classroom courses, followed by 3 days of on-the-job training. BDOs must memorize all of the behaviors and appearances on the SPOT checklist, as well as the point value assigned to each, in order to be able to add these up to determine if a passenger should be sent to SPOT referral screening. BDO applicants must also pass a job knowledge test at the conclusion of the training. The test includes related multiple choice questions, true or false statements, and case-based scenarios.

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## DHS Is Taking Action to Validate the Scientific Basis of TSA's SPOT Program but Opportunities Exist to Help Inform Future Program Decisions

Although DHS is in the process of validating the way in which the SPOT program utilizes the science of behavior detection in an airport environment, TSA deployed SPOT nationwide before first determining whether there was a scientifically valid basis for using behavior and appearance indicators as a means for reliably identifying passengers as potential threats in airports. TSA reported that it deployed SPOT before a scientific validation of the program was completed in response to the need to address potential threats to the aviation system that would not necessarily be detected by existing layers of aviation security. TSA stated that no other large-scale U.S. or international screening program incorporating behavior- and appearance-based indicators has ever been rigorously scientifically validated. While TSA deployed SPOT on the basis of some risk-related factors, such as threat information and airport passenger volume, it did not use a comprehensive risk assessment to guide its strategy of selectively deploying SPOT to 161 of the nation's 457 TSA-regulated airports. TSA also expanded the SPOT program over the last 3 years without the benefit of a cost-benefit analysis of SPOT. Additionally, TSA's strategic plan for SPOT could be improved by the inclusion of desirable characteristics identified in our prior work, such as risk assessment information, cost and resources analysis, and a means for collaboration with other key entities.

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<sup>27</sup>TSA-regulated airports have regular commercial passenger service and comply with TSA regulations for passengers and their property in order to operate.

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## TSA Is in the Process of Validating the Scientific Basis Used to Identify Passengers with SPOT Behaviors

TSA proceeded with deploying SPOT on a nationwide basis before determining whether the list of passenger behaviors and appearances underpinning the SPOT program were scientifically validated, and whether these techniques could be applied for counterterrorism purposes in an airport environment. In 2008, a report issued by the National Research Council of the National Academy of Sciences noted that behavior and appearances monitoring might be able to play a useful role in counterterrorism efforts but stated that a scientific consensus does not exist regarding whether any behavioral surveillance or physiological monitoring techniques are ready for use in the counterterrorist context given the present state of the science.<sup>28</sup> The report also stated that the scientific evidence for behavioral monitoring is preliminary in nature.<sup>29</sup> According to the report, an information-based program, such as a behavior detection program, should first determine if a scientific foundation exists and use scientifically valid criteria to evaluate its effectiveness before going forward. The report added that programs should have a sound experimental basis and documentation on the program's effectiveness should be reviewed by an independent entity capable of evaluating the supporting scientific evidence. The report also stated that often scientists and other experts can help independently assess the scientific evidence on the effectiveness of a program. A contributor to the National Research Council report also stated that no conclusive research has been conducted to determine if behavior detection can be reliably used on a larger scale, such as in an airport setting, to identify persons intending to cause harm to the aviation system.

While TSA and DHS's Science and Technology (S&T) Directorate officials agreed that SPOT was deployed before its scientific underpinnings were fully validated, they stated that no large-scale U.S. or international operational screening program incorporating behavior- and appearance-

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<sup>28</sup>National Research Council, *Protecting Individual Privacy in the Struggle Against Terrorists: A Framework for Assessment* (Washington, D.C.: National Academies Press, 2008). The report's preparation was overseen by the National Academy of Sciences Committee on Technical and Privacy Dimensions of Information for Terrorism Prevention and Other National Goals. Although the report addresses broader issues related to privacy and data mining, a senior National Research Council official stated that the committee included behavior detection as a focus because any behavior detection program could have privacy implications.

<sup>29</sup>Specifically, the report states that the scientific support for linkages between behavioral and physiological markers and mental state is strongest for elementary states, such as simple emotions; weak for more complex states, such as deception; and nonexistent for highly complex states, such as when individuals hold terrorist intent and beliefs.

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based indicators has been rigorously scientifically validated. These officials also questioned the findings of the National Research Council report and stated that the study lacked sufficient information for its conclusions because it did not consider recent findings from unpublished DHS, defense, and intelligence community studies.<sup>30</sup> However, National Research Council officials stated that an agency should be cautious about relying on the results of unpublished research that has not been peer reviewed, such as that generated by DHS and the defense and intelligence community, and using unpublished work as a basis for proceeding with a process, method, or program.<sup>31</sup> Moreover, we have previously reported that peer review is widely accepted as an important quality control mechanism that helps prevent the dissemination of potentially erroneous information.<sup>32</sup>

In addition to the unpublished research, TSA told us that the SPOT program was based on operational best practices from law enforcement, defense, and the intelligence communities. According to TSA officials, the agency based its choice of SPOT behavior, appearance, and deception indicators on existing research and training programs. For example, TSA cited research on emotions and their behavior indicators by Dr. Paul Ekman,<sup>33</sup> interviewing and interrogation by Stan Walters,<sup>34</sup> and nonverbal

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<sup>30</sup>DHS's S&T Directorate could not provide us with specific contacts related to the sources of this research.

<sup>31</sup>Peer review is the process of subjecting an author's scholarly work, research, or ideas to the scrutiny of others who are experts in the same field. Such review is considered a form of scientific validation.

<sup>32</sup>For example, we reported that the National Institutes of Health did not post its researchers' final reports because the risks associated with posting results that have not been scrutinized and validated by peer review are too great. See GAO, *University Research: Most Federal Agencies Need to Better Protect against Financial Conflicts of Interest*, [GAO-04-31](#) (Washington, D.C.: November 2003).

<sup>33</sup>Dr. Ekman is professor emeritus of psychology at the University of California Medical School, San Francisco, and is considered one of the world's foremost experts on facial expressions. His books include: *Emotions Revealed: Recognizing Faces and Feelings to Improve Communications and Emotional Life* (New York: Holt and Company, 2003); *Emotion in the Human Face* (New York: Pergamon Press, 1972); *Unmasking the Face: A Guide to Recognizing Emotions from Facial Clues* (Englewood Cliffs, N.J.: Prentice-Hall, 1975). Dr. Ekman has published more than 100 articles.

<sup>34</sup>Mr. Walters is the author of the *Principles of Kinesic Interview and Interrogation: 2<sup>nd</sup> Edition* as well as numerous training materials related to interviewing and interrogation techniques.

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indicators by Dr. David Givens<sup>35</sup> and Dr. Mark Frank<sup>36</sup> as support for the choice of several of the behavior indicators. According to TSA, its development of the SPOT program was based on related DHS research and information from the training curricula of other federal agencies, such as the Federal Transit Administration and the Bureau of Alcohol, Tobacco, Firearms, and Explosives.<sup>37</sup>

As with the SPOT behavior indicators, TSA told us that it sought input in creating the SPOT point scoring system from subject matter experts and from participants in TSA's SPOT working group, which consisted of law enforcement officials from agencies such as FBI, DEA, and local law enforcement officials.<sup>38</sup> While TSA officials said that they coordinated with relevant subject matter experts, such as Dr. Ekman, and based the SPOT scoring system on existing research and training programs, no validation of the behavior, appearance, and deception indicators was conducted prior to the deployment of SPOT in November 2006. According to TSA officials, they used professional judgment in developing the SPOT

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<sup>35</sup>Dr. Givens is the director of the nonprofit Center for Nonverbal Studies, in Spokane, Washington. Dr. Givens is the author of *Love Signals: A Practical Field Guide to the Body Language of Courtship* (St. Martin's, New York, 2005) and *Crime Signals: How to Spot a Criminal Before You Become a Victim* (St. Martin's, 2008). The Center's Web site links to Dr. Givens' online reference tool, *The Nonverbal Dictionary of Gestures, Signs and Body Language Cues*. Dr. Givens said that he had did not know which nonverbal indicators had been selected by TSA for use in SPOT, that he had not been asked by TSA to review their choices from his list, or to review other aspects of the SPOT program. According to Dr. Givens, attempting to detect more than nine nonverbal indicators would be difficult for most individuals, even those trained in behavior detection.

<sup>36</sup>Dr. Frank is Associate Professor, Department of Communication, College of Arts and Sciences, at the University at Buffalo, State University of New York. He is on the Advisory Board of the University's Center for Unified Biometrics and Sensors, and has conducted research supported by DHS, the Defense Advanced Research Projects Agency, and the National Science Foundation. Dr. Frank told us that he had observed SPOT at an airport and had some coordination with TSA. However, he said that he had not reviewed the SPOT training curriculum or the SPOT scoring system. Dr. Frank stated that no study has been performed to validate use of behavior detection in an airport setting.

<sup>37</sup>According to DHS's S&T Directorate, it completed a study on suicide bomber indicators in July 2009. The program manager stated that they reviewed 157 documents and identified approximately 1,200 suicide indicators, which were similar to SPOT suicide bomber indicators. S&T stated that the study provides preliminary support for the detection of suicide bomber indicators and that SPOT represents best practices from defense and intelligence organizations.

<sup>38</sup>According to TSA, the FBI participated in discussions related to SPOT's development in 2006.

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point system and stated that the purpose of developing the scoring system was to increase the objectivity of the SPOT process.

Dr. Ekman stated that, in his opinion, and after reviewing the scoring system and observing the program in operation, it was not clear whether the SPOT behaviors and appearances, and the related point system, could be used effectively in an airport environment because no credible validation research on this issue had been conducted. He noted, for example, that research is needed to identify how many BDOs are required to observe a given number of passengers moving at a given rate per day in an airport environment, or the length of time that such observation can be conducted before observation fatigue affects the effectiveness of the personnel. He commented that observation fatigue is a well-known phenomenon among workers whose work involves intense observation, and that it is essential to determine the duration of effective observation and to ensure consistency and reliability among the personnel carrying out the observations.

DHS has recognized the need to conduct additional research to scientifically validate the use of the SPOT behavioral indicators in an airport environment. DHS's S&T Directorate began research in 2007 to determine if there is a statistically significant correlation between the SPOT behaviors exhibited by airport passengers and finding airport passengers with prohibited items (such as weapons), false documents, and illegal drugs or who pose a potential risk to aviation security. According to S&T, this research is expected to be completed in fiscal year 2011 and is to include three key elements. First, the study's purpose is to assess the reliability of the SPOT program by analyzing TSA's SPOT database to determine patterns of BDO scoring to measure consistency across BDOs, teams, locations, and other variables. Second, the study aims to compare the current implementation of SPOT to random passenger screening. Specifically, according to S&T officials, 130,000 passengers are to be randomly selected for additional SPOT referral screening. The study's design states that data collected about these passengers will be compared to data for passengers screened through the normal SPOT process. S&T officials expect that the results of this element of the study will provide a better understanding of how SPOT compares to random selection, as well as providing a baseline of each indicator present in the traveling public. Third, the study also aims to utilize live and video data, as available, to measure SPOT score ratings by BDOs of behaviors exhibited by passengers against ratings of the same passengers by subject matter experts. This element of the study could help determine whether BDOs are using, or are continuing to use, the SPOT score sheet correctly as time

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passes after their initial training. According to S&T officials, the study is to form the basis for BDO performance and training requirements.

The S&T Directorate reported some preliminary findings associated with this research in February 2008. The Directorate reported that although some of the existing literature supported the possibility of using behavioral and physiological cues, the results are not methodologically strong enough to support standardized applications in an operational setting.<sup>39</sup> The preliminary findings also noted that it is not known whether behavioral and physiological cues linked to deception in planning a hostile action will be the same or different as those indicators linked to deception by an individual after they have already engaged in a hostile action. However, an S&T program director stated that although early literature can be characterized as methodologically weak, more recent unpublished research sponsored by DHS, the Department of Defense, and the intelligence community is promising in that it has demonstrated some linkages between behavioral and physiological indicators and deception.<sup>40</sup>

In March 2009, the Under Secretary (Acting) for DHS's S&T Directorate testified that the Directorate had performed an initial validation of the behavior indicators used by BDOs.<sup>41</sup> The Under Secretary stated that this analysis provided statistically significant support that persons demonstrating select behavioral indicators are more likely to possess prohibited items and that behaviors can distinguish deceptive from nondeceptive individuals. According to S&T, this validation was the result of statistical analyses performed by S&T using operational data from the SPOT program database. However, we identified weaknesses in TSA's process for maintaining these data. For example, controls over the SPOT database to help ensure the completeness and accuracy of the data were missing. Specifically, the SPOT database did not have computerized edit checks built into the system to review the format, existence, and reasonableness of data. For example, we found that discrepancies existed

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<sup>39</sup>American Institutes for Research, *Behavioral Indicators Related to Deception in Individuals with Hostile Intentions: Interim Results* (Washington, D.C.: February 2008). According to S&T officials, this review included research conducted prior to 2005.

<sup>40</sup>DHS could not provide us with specific contacts related to the sources of this research; we were therefore unable to determine the extent to which it has demonstrated linkages between behavioral and physiological indicators and deception.

<sup>41</sup>Statement of the Under Secretary (Acting), DHS S&T Directorate, before the Subcommittee on Homeland Security, Committee on Appropriations, U.S. House of Representatives, March 26, 2009.

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between the number of passengers arrested by local law enforcement at the screening checkpoints and the number of screened passengers recorded as arrested. In another example, we found that the total number of LEO referrals differed from the number of passenger records with information on the reasons for LEO referral. Internal control standards state that controls should be installed at an application's interfaces with other systems to ensure that all inputs are received and are valid and that outputs are correct and properly distributed.<sup>42</sup> TSA officials explained these issues as data anomalies and planned to change instructions to staff entering data to reduce these problems. Although TSA is taking steps to update the SPOT database, which are discussed later in this report, the data used by S&T to conduct its preliminary validation of related behaviors lacked such controls. In addition, BDOs could not input all behaviors observed in the SPOT database because the database limits entry to eight behaviors, six signs of deception, and four types of prohibited items per passenger referred for additional screening. Because of these data-related issues, meaningful analyses could not be conducted to determine if there is an association between certain behaviors and the likelihood that a person displaying certain behaviors would be referred to a LEO or whether any behavior or combination of behaviors could be used to distinguish deceptive from nondeceptive individuals. As a result, TSA lacks assurance that the SPOT data can be used effectively to determine that the person poses a risk to aviation security. S&T has recognized weaknesses in the procedures for collecting data on passengers screened by SPOT and plans to more systematically collect data during its study by, for example, requiring BDOs to record more complete and accurate information related to a passenger referral immediately following resolution.

The S&T study is an important step to determine whether SPOT is more effective at identifying passengers who may be threats to the aviation system than random screening. However, S&T's current research plan is not designed to fully validate whether behavior detection and appearances can be effectively used to reliably identify individuals in an airport terminal environment who pose a risk to the aviation system. For example, research on other issues, such as determining the number of individuals needed to observe a given number of passengers moving at a given rate per day in an airport environment or the duration that such observation can be conducted by BDOs before observation fatigue affects

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<sup>42</sup>[GAO/AIMD-00-21.3.1.](#)

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effectiveness, could provide additional information on the extent to which SPOT can be effectively implemented in airports. In another example, Dr. Ekman told us that additional research could help determine the need for periodic refresher training since no research has yet determined whether behavior detection is easily forgotten or can be potentially degraded with time or lack of use. While S&T officials agree on the need to validate the science of behavior detection programs, they told us that some of these other issues could be examined in the future but are not part of the current plan due to time and budgetary constraints. According to S&T, some additional analysis is underway to inform the current BDO selection process. This analysis is intended to provide information on the knowledge, skills, abilities, and other characteristics of successful BDOs. Since the analysis is scheduled for completion in May 2010, it remains unclear to what extent the findings will help to validate the science related to SPOT. While we recognize the potential benefits of these efforts, we believe that an assessment by an independent panel of experts of the planned methodology of DHS's study could help DHS assess the costs and benefits associated with a more comprehensive methodology designed to fully validate the science related to SPOT. Our prior work has recommended the use of such independent panels for comprehensive, objective reviews of complex issues.<sup>43</sup> In addition, according to the National Research Council, an independent panel could provide an objective assessment of the methodology and findings of DHS's study to better ensure that SPOT is based on validated science. Thus, an independent panel of experts could help DHS develop a comprehensive methodology to determine if the SPOT program is based on valid scientific principles that can be effectively applied in an airport environment for counterterrorism purposes.

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<sup>43</sup>See GAO, *Oil and Gas Royalties: The Federal System for Collecting Oil and Gas Revenues Needs Comprehensive Reassessment*, [GAO-08-691](#) (Washington, D.C.: Sept. 3, 2008). GAO, *Combating Nuclear Smuggling: Additional Actions Needed to Ensure Adequate Testing of Next Generation Radiation Detection Equipment*, [GAO-07-124T](#) (Washington, D.C.: Sept. 18, 2007). GAO, *Space Operations: NASA Efforts to Develop and Deploy Advanced Spacecraft Computers*, [GAO/IMTEC-89-17](#) (Washington, D.C.: Mar. 31, 1989). GAO, *Quadrennial Defense Review: Future Reviews Could Benefit from Improved Department of Defense Analyses and Changes to Legislative Requirements*, [GAO-07-709](#) (Washington, D.C.: Sept. 14, 2007). GAO, *Coast Guard: Challenges for Addressing Budget Constraints*, [GAO/RCED-97-110](#) (Washington, D.C.: May 1997).

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## SPOT Was Deployed Nationwide on Basis of Threat, but Without a Comprehensive Risk Assessment

According to DHS's National Infrastructure Protection Plan (NIPP), risk assessments are to be documented, reproducible (so that others can verify the results), defensible (technically sound and free of significant errors), and complete. The NIPP states that comprehensive risk assessments are necessary for determining which assets or systems face the highest risk, for prioritizing risk mitigation efforts and the allocation of resources, and for effectively measuring how security programs reduce risks. For a risk assessment to be considered complete, the NIPP states that it must specifically assess threat, vulnerability, and consequence;<sup>44</sup> after these three components have been assessed, they are to be combined to produce a risk estimate.<sup>45</sup>

According to TSA, SPOT was deployed to TSA-regulated airports on the basis of threat information in TSA's Current Airport Threat Assessment list.<sup>46</sup> TSA deployed SPOT to 161 of 457 TSA-regulated airports. TSA officials told us that this selective deployment creates unpredictability for persons seeking to cause harm to the aviation system because they would not know which airports had BDO teams and because BDOs are occasionally sent out to the smaller airports that do not have BDOs on a permanent basis. Although TSA's selective deployment of SPOT was based on threat information, TSA did not conduct vulnerability and consequence assessments to inform the deployment of BDOs. As a result,

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<sup>44</sup>DHS's NIPP defines risk as a function of threat, vulnerability, and consequence. Threat is an indication of the likelihood that a specific type of attack will be initiated against a specific target or class of targets. Vulnerability is the probability that a particular attempted attack will succeed against a particular target or class of targets. Consequence is the effect of a successful attack.

<sup>45</sup>As updated in 2009, the NIPP states that to be complete a risk assessment is to assess threat, vulnerability, and consequence for every defined risk scenario. However, because the original 2006 version of the NIPP described risk assessments that included all three components as "credible," our previous reports use this term rather than "complete" (see GAO, *Transportation Security: Comprehensive Risk Assessments and Stronger Internal Controls Needed to Help Inform TSA Resource Allocation*, [GAO-09-492](#) (Washington, D.C.: Mar. 27, 2009)).

<sup>46</sup>We reported in March 2009 that TSA does not assign uncertainty or varying levels of confidence associated with the intelligence information used to identify threats to the transportation sector and guide TSA's planning and investment decisions. Since TSA's intelligence products have not assigned confidence levels to its analytic judgments, it is difficult for TSA to correctly prioritize its tactics and investments based on uncertain intelligence. In March 2009, we recommended that TSA work with the Director of National Intelligence to determine the best approach for assigning uncertainty or confidence levels to analytic intelligence products and to apply this approach. TSA agreed with this recommendation and said it has begun taking action to address it. See [GAO-09-492](#).

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it could not combine the results to conduct a comprehensive risk assessment to inform the deployment of BDOs to those airports with the highest risks.

TSA officials told us that while they have not completed a comprehensive risk assessment for airport security, they have prepared and are currently reviewing a draft of a comprehensive, scenario-based Aviation Modal Risk Assessment—known as the AMRA—which is to serve as a comprehensive risk assessment for aviation security.<sup>47</sup> According to TSA officials, the AMRA is to address all three elements of risk for domestic commercial aviation, general aviation, and air cargo.<sup>48</sup> Although TSA planned to release the AMRA in February 2008, it now expects to finalize the AMRA in 2010. According to TSA, the AMRA may help provide information for the prioritization of BDO deployment within airports, but could not provide specifics on how it would do so. Further, TSA officials noted that information from AMRA would inform BDO deployment in conjunction with other TSA priorities not related to SPOT.<sup>49</sup> Since the AMRA is not yet complete, it is not clear whether it will provide the risk analysis—including assessments of vulnerability and consequence—needed to inform TSA’s decisions and planning for any revisions or future deployment of SPOT. If AMRA lacks information relevant to the deployment of SPOT and further research determines that SPOT has a scientifically validated basis for using behavior detection for counterterrorism purposes in the airport environment, then conducting a comprehensive risk assessment of airports could strengthen TSA’s ability to establish priorities and make cost-effective resource decisions

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<sup>47</sup>The AMRA is being developed by TSA pursuant to the National Strategy for Aviation Security, which was issued according to Homeland Security Presidential Directive-16. HSPD-16 directs the production of an overarching national strategy to optimize and integrate government-wide aviation security efforts. AMRA was previously known as the Air Domain Risk Assessment or ADRA.

<sup>48</sup>Commercial aviation includes that sector of the nation’s civil aviation system that provides for the transportation of individuals by scheduled or chartered operations for a fee, including air carriers and airports. General aviation includes all civil aviation other than commercial and military operations, including flight operations such as personal/family transportation, emergency services, wildlife and land surveys, traffic reporting, agricultural aviation, firefighting, and law enforcement. Air cargo is defined as cargo carried on passenger and all-cargo aircraft.

<sup>49</sup>In addition, TSA states that its risk management analysis toolset may also be useful in prioritizing BDO deployments since the toolset analyzes various scenarios for which the use of BDOs may be applicable.

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regarding the deployment of BDOs to those airports deemed to have the highest priority risks.

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## TSA Deployed SPOT Nationwide Without Conducting a Cost-Benefit Analysis but Such an Analysis Could Help Inform Program Decisions Moving Forward

DHS and other federal guidance recommend conducting a cost-benefit analysis before implementing new programs to avoid unnecessary costs and identify the best way to achieve goals at the lowest costs among potential alternatives. Our prior work has also supported the use of cost-benefit analyses during retrospective reviews to validate the agency's original assumptions regarding costs and benefits.<sup>50</sup> In addition, the DHS February 2006 *Cost-Benefit Analysis Guidebook* and OMB guidance both recommend the use of cost-benefit analysis, both in the planning stage for a program, and when significant milestones or financial options are to be assessed.<sup>51</sup> The DHS *Guidebook* states that a cost-benefit analysis is designed to identify optimal financial solutions among competing alternatives. OMB guidance also identifies cost-benefit analysis as one of the key principles to be considered when making capital expenditures, that expected benefits of proposed actions should be explained, and that a baseline should be identified discussing costs and benefits in comparison with clearly defined alternatives. DHS's 2006 and 2009 NIPPs also state that priority is to be given to those protective measures that provide the greatest mitigation of risk for the resources that are available. The DHS NIPPs add that effective protective programs seek to use resources efficiently by focusing on actions that offer the greatest mitigation of risk for any given expenditure. In addition, measuring cost effectiveness of SPOT was a key TSA goal in an October 2005 version of the SPOT strategic plan.

Although the DHS and OMB guidance recommend that a cost-benefit analysis be conducted prior to deploying a program nationwide—and potentially incurring substantial costs—TSA did not conduct such an analysis of SPOT to inform its pilot testing prior to full-scale nationwide deployment. In early 2003, TSA began conducting a pilot test of the SPOT program at Boston Logan airport to better understand the benefits of the program. According to Boston Logan's Federal Security Director, the

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<sup>50</sup>See GAO, *Reexamining Regulations: Opportunities Exist to Improve Effectiveness and Transparency of Retrospective Reviews*, [GAO-07-791](#) (Washington, D.C.: July 16, 2007).

<sup>51</sup>DHS, *Cost Benefit Analysis Guidebook* (Washington, D.C.: February 2006); OMB, Circular No. A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (Washington, D.C.: October 1992); OMB, Circular No. A-4, *Regulatory Analysis* (Washington, D.C.: September 2003).

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primary purpose of this pilot test was to understand the potential of the program, not to validate its success.<sup>52</sup> TSA officials stated that the program had several benefits, one of which was its “negligible cost.” However, TSA did not analyze the pilot test results to determine if SPOT was more cost effective than other alternatives, such as random screening of passengers. In October 2004, TSA implemented additional pilot programs in Providence, Rhode Island and Portland, Maine with the goal of providing Federal Security Directors with an additional layer of security to identify high-risk passengers for additional screening using behavior detection techniques. TSA concluded that the pilot program was successful and cited several security benefits of these pilots. For example, TSA personnel in Providence identified two individuals in possession of illegal drugs, who were then arrested. Law enforcement also arrested another individual referred to them for providing a fraudulent passport. In another example, BDOs in Portland discovered a passenger with multiple passports and a hidden luggage compartment. The passenger was interviewed by LEOs and later released.

TSA determined that these initial pilot tests at three airports were successful without comparing pilot test data to other possible security alternatives. For example, the results of random screening of passengers at the pilot airports could have provided TSA with objective baseline data. Specifically, these data could have been compared to data collected during the SPOT pilots to determine if SPOT was more effective than random screening in detecting passengers who pose a potential risk to aviation security. TSA concluded that the pilot tests were successful because pilot airports were able to easily incorporate SPOT into their security program, train personnel in SPOT, and implement procedures for an additional layer of security according to TSA.

TSA conducted additional pilot tests at the Minneapolis-St. Paul, Minnesota and Bangor, Maine airports in October 2005. TSA also deployed the program to nine additional airports in response to TSA’s holiday preparedness plan in December 2005 to further operationally test the program. Senior SPOT program officials explained that TSA did not conduct an analysis of the pilot testing because the program was in its

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<sup>52</sup> A pilot test is a preliminary test or study to try out procedures and discover problems before the main study begins. This enables researchers to make last minute corrections and adjustments. In a pilot, the entire study with all of its instruments and procedures is conducted in miniature. See W.P. Vogt, *Dictionary of Statistics and Methodology: A Nontechnical Guide for the Social Sciences* (Newbury Park: Sage Publications, 1993).

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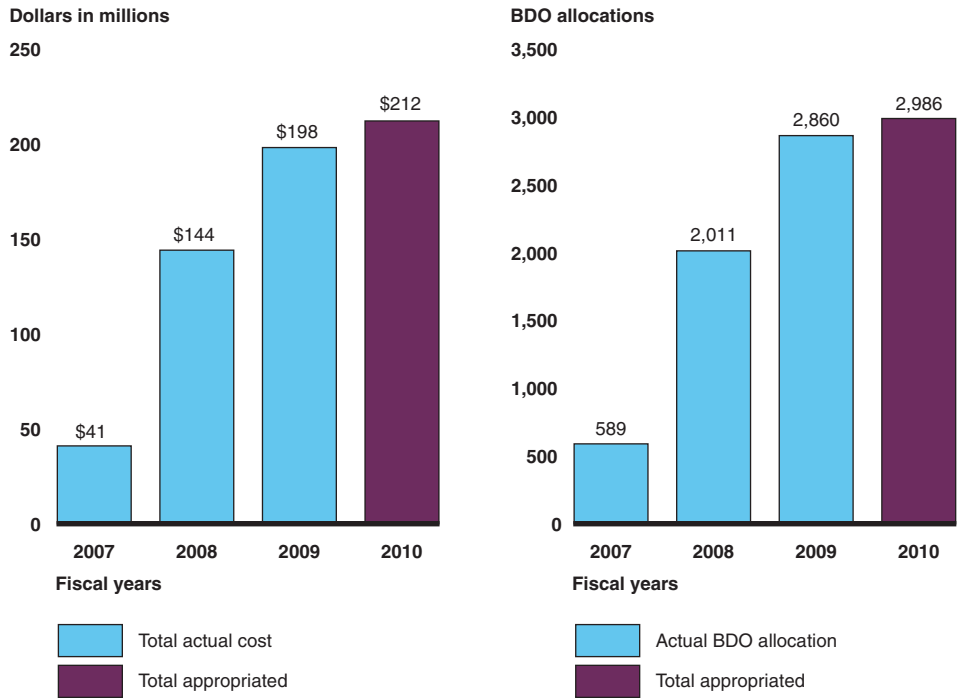
infancy and officials were focused on deploying SPOT to additional airports. Since that time, TSA has not conducted a cost-benefit analysis, which could help the agency establish the value of the program relative to other layers of aviation security. Moreover, a cost-benefit analysis could also be useful considering recent program growth. For example, from fiscal year 2007 through fiscal year 2009, TSA allotted about \$383 million for SPOT. During this period, SPOT's share of TSA's total screening operations budget increased from 1 percent to 5 percent.<sup>53</sup> The conference report accompanying the fiscal year 2010 DHS appropriations act designates \$212 million of the appropriated aviation security funding for the SPOT program.<sup>54</sup> A cost-benefit analysis could have provided TSA management with analysis on whether this allocation was a prudent investment, as well as whether this level of investment in SPOT is appropriate. Figure 3 shows the growth in the budget and personnel numbers for SPOT from fiscal years 2007 through 2010.

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<sup>53</sup>The increase rate for TSA's other screening operations combined was about 0.27 percent from fiscal year 2007 to fiscal year 2009 (from \$3.727 billion to \$3.737 billion, a \$10 million increase). The screening operations account includes privatized screening; passenger and baggage screener performance, compensation, and benefits; screener training and other; human resource services; and checkpoint support.

<sup>54</sup>See H.R. Rep. No. 111-298, at 77 (2009) (Conf. Rep.).

**Figure 3: Budget and Personnel Growth in the SPOT Program, Fiscal Years 2007 through 2010**



Source: GAO analysis of TSA data.

Note: The actual BDO allocation for fiscal year 2009 is as of June 2009. The appropriated amount for SPOT for fiscal year 2010 is the amount reflected in the conference report accompanying the fiscal year 2010 DHS appropriations act. The appropriated amounts prior to fiscal year 2010 cannot be determined because funding was appropriated as a lump sum with funding for other screeners and the relevant conference reports did not allocate a specific amount for SPOT. BDO allocation figures are full-time equivalents.

**SPOT’s Strategic Plan  
Could be Strengthened by  
Addressing Key  
Characteristics of a  
Successful Strategy**

Our previous work,<sup>55</sup> and the Government Performance and Results Act,<sup>56</sup> set forth several key elements of a strategic plan. Such plans can guide agencies in planning and implementing an effective government program. Table 1 summarizes the desirable characteristics of an effective strategic plan, as identified in our prior work. In April 2009, we reported that these characteristics are the starting point for developing a strategic plan.<sup>57</sup>

**Table 1: Summary of Desirable Characteristics for Developing a Strategic Plan**

<b>Desirable characteristic</b>	<b>Description</b>
Purpose, scope, and methodology	Addresses why the plan was produced, the scope of its coverage, and the process by which it was developed.
Problem definition and risk assessment	Addresses the particular problems and threats the plan is directed towards.
Goals, subordinate objectives, activities, and performance measures	Addresses what the plan is trying to achieve, steps to achieve those results, as well as the priorities, milestones, and performance measures to gauge results.
Resources, investments, and risk management	Addresses what the plan will cost, the sources and types of resources and investments needed, and where resources and investments should be targeted based on balancing risk reductions with cost.
Organizational roles, responsibilities, and coordination	Addresses who will implement the plan, what their roles will be compared to others, and mechanisms for them to coordinate their efforts.
Integration and implementation	Addresses how the plan relates to the agency’s other goals, objectives, and activities, to other federal and nonfederal entities involved in implementation or coordination, and their plans to implement the strategic plan.

Source: GAO analysis based on [GAO-09-369](#) and [GAO-04-408T](#).

TSA officials at Boston Logan airport told us that they completed the first strategic plan for SPOT in 2006. The strategic plan was last updated in March 2007. The March 2007 plan includes some of the desirable characteristics described above, such as an overall purpose. However, incorporating additional characteristics of an effective strategic plan could enhance the plan’s usefulness in program management and resource allocation decisions to effectively manage the deployment of SPOT if TSA

<sup>55</sup> [GAO-04-408T](#).

<sup>56</sup> Pub. L. No. 103-62, 107 Stat. 285 (1993).

<sup>57</sup> See GAO, *National Preparedness: FEMA Has Made Progress, but Needs to Complete and Integrate Planning, Exercise, and Assessment Efforts*, [GAO-09-369](#) (Washington, D.C.: Apr. 30, 2009).

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determines that the program has a scientifically valid basis. TSA officials stated that they believed the plan was sufficiently comprehensive to develop a national program, such as SPOT. However, these officials told us that the plan was not updated after TSA expanded the program in 2008 and 2009. They also stated that the program's focus remained on deploying SPOT to additional airports. Our assessment of the extent to which the SPOT strategic plan addresses these characteristics is presented below.

**Purpose, scope, and methodology:** The SPOT strategic plan addresses why the plan was developed (i.e., purpose) and the scope of its coverage. Specifically, the plan describes a strategy to utilize behavior detection screening as an additional layer of security. The plan also notes that the primary focus is to expand SPOT in the aviation environment while also developing a capability to deploy BDOs to support security efforts in all modes of transportation. However, the plan does not discuss the process by which it was developed (i.e., methodology). According to TSA, officials responsible for developing the plan received input from relevant stakeholders at Boston Logan airport and TSA headquarters. We believe incorporating the methodology into the plan could make the document more useful to TSA and other organizations, such as local law enforcement, responsible for implementing the plan.

**Problem definition and risk assessment:** The plan addresses the particular threat it is directed towards. Specifically, the plan describes the need to implement SPOT to counter terrorist activities, improve security, and incorporate additional layers of protection within aviation security. However, the plan does not incorporate risk assessment information to identify priorities or guide program implementation because TSA has not conducted a comprehensive risk assessment related to the deployment of SPOT.<sup>58</sup> Using available risk assessment information to inform the development of a strategic plan would help ensure that clear priorities are established and focused on the areas of greatest need. Specifically, incorporating the results of a risk assessment in the program's strategic plan could help inform TSA's decisions such as whether to deploy SPOT to additional TSA-regulated airports, to shift SPOT teams from one airport to another, or to remove SPOT at airports where the benefit of addressing the risk does not outweigh the costs, as well as to identify and communicate

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<sup>58</sup>TSA, *Strategic Plan for Behavior Detection Program* (Washington, D.C.: 2007).

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the risks to aviation security if SPOT was not deployed to all TSA-regulated airports.

**Goals, subordinate objectives, activities, and performance measures:** The plan outlines several goals, objectives, and activities for the SPOT program to achieve. For example, the plan outlines a goal to develop multimodal partnerships, including at the local level, to support SPOT. An associated objective for this goal includes identifying and fostering advocates within each mode of transportation by developing transportation, intelligence, and law enforcement working groups with relevant officials to share information and foster cooperation. The plan also includes a goal to develop and implement performance measures for SPOT. However, the plan did not include performance measures for SPOT. Incorporating performance measures into the plan could help TSA officials measure progress in implementing the plan's goals, objectives, and activities.

**Resources, investments, and risk management:** The plan does not identify the costs and resources needed to achieve program objectives discussed in the plan. Incorporating information about cost and resources would facilitate TSA's ability to allocate resources across programs according to priorities and constraints, track costs and performance, and shift such investments and resources as appropriate.

**Organizational roles, responsibilities, and coordination:** The SPOT program relies on a close partnership with law enforcement officers at airports. TSA provides briefings to law enforcement on the SPOT program, and TSA officials conduct outreach efforts to local law enforcement as needed. The SPOT SOP guidance and SPOT training include guidance about ensuring that LEOs receive complete and accurate information about each SPOT referral. However, while the strategic plan identifies TSA officials and offices as responsible parties for implementing the strategic plan, it does not provide guidance on how to effectively link the roles, responsibilities, and capabilities of federal, state, and local officials providing program support. Moreover, although SPOT SOP guidance discusses the need for BDOs to coordinate with other TSA personnel, such as TSOs and TDCs, TSA does not identify their roles and responsibilities in regards to the SPOT program in the program's strategic plan. Integrating these elements into the strategic plan could help to clarify the relationships between these various implementing parties, which would thereby increase accountability and improve the effectiveness of implementation.

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**Integration and implementation:** The SPOT strategic plan does not discuss how its scope complements, expands upon, or overlaps with other related strategic documents. For example, TSA’s April 2008 Office of Security Operations Organizational Business Plan for Fiscal Year 2010 describes how its goals—including those for SPOT—relate to DHS and TSA strategic goals.<sup>59</sup> However, TSA does not link goals in the SPOT strategic plan with other related strategic documents, such as the Aviation Implementation Plan of DHS’s Transportation Systems Sector-Specific Plan<sup>60</sup> and the Passenger Checkpoint Screening Program Strategic Plan.<sup>61</sup> By linking goals in its SPOT strategic plan to other TSA efforts, TSA could better ensure that the program’s objectives are integrated with other TSA security programs and that resources are used effectively by minimizing any unnecessary duplication with these other actions.

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## More Fully and Consistently Utilizing Available Information Technology Could Enhance TSA’s Ability to Identify Threats to the Aviation System

Inconsistencies in the use of available information technology to aid in the collection and recording of data on passengers by BDOs during referrals to LEOs, lack of guidance on, or a mechanism for, BDOs to request the TSA’s Transportation Security Operations Center to run the names of passengers exhibiting suspicious behaviors against law enforcement and intelligence databases, and the Center’s not checking all of the databases available to it—have limited TSA’s ability to identify potential terrorist threats to the aviation system.<sup>62</sup> Among other information, these databases include terrorism-related watch lists.

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<sup>59</sup>TSA, Office of Security Operations, *Strategy Deployment Organizational Business Plan for Fiscal Year 2010* (Washington, D.C.: Apr. 8, 2008).

<sup>60</sup>Within the Transportation System Sector-Specific Plan, the aviation implementation plan outlines transportation security goals and key objectives with associated programs within the aviation community. The plan notes that SPOT is intended to identify suspicious activities within the aviation domain.

<sup>61</sup>TSA issued its Passenger Checkpoint Screening Program Strategic Plan in August 2008 to outline its strategy and approach for implementing advanced security capabilities in airport checkpoints using a combination of people, processes, and technology at all airport checkpoints. The plan cites TSA’s behavior detection capability as one of three strategic initiatives.

<sup>62</sup>The Transportation Security Operations Center is the central operations and information-gathering point for TSA across the nation; it serves as a 24/7-point of contact for all transportation security concerns, providing access to multiple criminal justice and intelligence-related databases.

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Systematic Collection of Data on Passengers Identified Through the SPOT Program Could be Improved to Better Identify Activity Potentially Harmful to the Aviation System

TSA is not fully utilizing the resources it has available to systematically collect the information obtained by BDOs on passengers whose behaviors and appearances resulted in either SPOT referral screening, or in a referral to LEOs, and who thus may pose a risk to the aviation system. TSA's July 2008 Privacy Impact Assessment on the TSA Transportation Security Operations Center, and its August 2008 Privacy Impact Assessment on SPOT, state that information may be obtained by BDOs to check an individual's identity against intelligence, terrorist, and law enforcement databases and to permit intelligence analysts to conduct trend analysis.<sup>63</sup>

The August 2008 SPOT Privacy Impact Assessment states that information about a passenger who has exceeded the SPOT behavior threshold, leading to LEO referral, may be collected and entered into DHS's Transportation Information Sharing System.<sup>64</sup> According to the SPOT Privacy Impact Assessment, information collected may be submitted to the Transportation Information Sharing System database for analysis, and, through it to other linked intelligence databases and the intelligence analysts who study them, to detect, deter, and defeat a criminal or terrorist act in the transportation domain before it occurs. The SPOT Privacy Impact Assessment notes that terrorist acts that threaten transportation security are most vulnerable in the planning stages and that the timely passage of SPOT referral information may assist in identifying such efforts before they become operational. A June 2008 Transportation Information Sharing System Privacy Impact Assessment similarly states that one goal is to use the system data to find trends and patterns that may indicate preoperational terrorist or criminal activity—that is, to “connect the dots” about a planned terrorist attack or criminal enterprise. Information in TSA's Transportation Information Sharing System is primarily activity or behavioral information but may also contain personal information regarding the individuals identified by the BDO through SPOT. According

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<sup>63</sup>DHS, *Privacy Impact Assessment for the TSA Operations Center Incident Management System* (Washington, D.C.: July 8, 2008), and *Privacy Impact Assessment for the Screening of Passengers by Observation Techniques (SPOT) Program* (Washington, D.C.: Aug. 5, 2008).

<sup>64</sup>DHS, *Privacy Impact Assessment for the Transportation Information Sharing System* (Washington, D.C.: June 2008). The Transportation Information Sharing System is a database owned by the TSA's FAMS component; the data entered into it may be shared with other federal, state, or local law enforcement and law enforcement support entities. Federal air marshals file reports related to the observation of suspicious activities and input this information, as well as incident reports submitted by airline employees and other individuals within the aviation domain, into the Transportation Information Sharing System.

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to TSA, BDOs do not analyze the data obtained during referrals; if they have the appropriate training, they may enter the data by computer into the Transportation Information Sharing System, where they can be analyzed by intelligence analysts. Other appropriately trained and officially designated TSA officials, such as Federal Security Directors, may also enter data into the system.

According to TSA, a 2008 pilot program it conducted that involved BDOs entering data into the Transportation Information Sharing System database was “invaluable,” in part because over 40 referrals have since been passed on to other LEO organizations for further investigation, most of which came from BDO input. A February 2006 TSA memorandum describes the Transportation Information Sharing System as “a critical element in the success of SPOT” because it provides the necessary platform for the reporting of information obtained as a result of SPOT referrals. TSA noted that through the use of the Transportation Information Sharing System, two different BDO teams had separately identified and selected the “same extremist” for secondary questioning.<sup>65</sup> TSA officials also told us about an incident in which an individual sought to board an aircraft with a handgun on two separate occasions, at two different airports. Although the handgun was detected both times, the individual was released after providing what seemed to be a credible explanation. After the second incident, however, intelligence analysts who reviewed the system information saw that this individual had tried twice in 2 weeks to bring a weapon onto an aircraft. A LEO was dispatched to the person’s home, and an arrest was made. Without the data inputted into the system both times, no pattern would have been detected by the analysts, according to TSA. Although the pilot program illustrated the benefits of BDOs entering data into the system, access to the system was not expanded to all SPOT airports in 2008 or 2009.

Internal control standards call for management to develop policies, procedures, and techniques to help enforce management directives. TSA does not provide official guidance on how or when BDOs or other TSA personnel should enter data into the Transportation Information Sharing System or which data should be entered. Official guidance on what data should be entered into the system on passengers could better position TSA

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<sup>65</sup>Because the SPOT program has not been scientifically validated, it cannot be determined if these anecdotal results were better than if passengers had been pulled aside at random, rather than as a consequence of being identified for further screening by BDOs.

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personnel to be able to consistently collect information to facilitate synthesis and analysis in “connecting the dots” with regard to persons who may pose a threat to the aviation system.

On March 18, 2010, TSA officials told us that TSA recognizes the value of recording SPOT incidents for the purposes of intelligence gathering. As a result, TSA decided that certain data would be entered into the Transportation Information Sharing System, and would, in turn, be analyzed as a way to potentially “connect the dots” with other transportation security incidents.<sup>66</sup>

TSA officials said that the Federal Security Director at each SPOT airport has been given the discretion to decide which personnel should have access to the Transportation Information Sharing System. However, TSA has not developed a plan detailing how many personnel would have access to the system, or when they would have access at SPOT airports. TSA officials said that training is currently being provided to personnel responsible for using the system at all SPOT airports although they did not provide information on the number being trained.

Standard practices for defining, designing, and executing programs include developing a road map, or program plan, to establish an order for executing specific projects needed to obtain defined programmatic results within a specified time frame. However, TSA stated that it has not developed a schedule or milestones by which database access will be deployed to SPOT airports, or a date by which access at all SPOT airports will be completed. Setting milestones for expanding Transportation Information Sharing System access to all SPOT airports, and setting a date by which the expansion will be completed, could better position TSA to identify threats to the aviation system that may otherwise go undetected and help TSA track its progress in expanding Transportation Information Sharing System access as management intended.

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<sup>66</sup>Some details about the process were deleted because TSA considered them to be Sensitive Security Information.

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## Guidance on and a Mechanism for Running Names of Referred Passengers Through the Databases Available to the Transportation Security Operations Center Could Help Improve SPOT Practices

Internal control standards state that policies, procedures, techniques, and other mechanisms are essential to help ensure that actions are taken to address program risks.<sup>67</sup> The current process makes the BDOs dependent on the LEOs with regard to the timeliness that LEOs respond to BDO calls for service, as well as with regard to whether the LEOs choose to question the passengers referred to them or conduct a background check. Our analysis of the SPOT referral database found a wide variation in the percent of times that LEOs responded to calls for service at SPOT airports.<sup>68</sup> Moreover, if a local LEO decides to run a background check on a passenger referred to them, they would be accessing the FBI's NCIC and not other intelligence and law enforcement databases.

Although LEOs may not always respond to calls for service, question passengers, or check passenger names against databases available to TSA, TSA has not developed a mechanism allowing BDOs to send information to the Transportation Security Operations Center about passengers whose behavior indicates that they may be a possible threat to aviation security. According to TSA's July 2008 Transportation Security Operations Center Privacy Impact Assessment, passenger information may be submitted to the Transportation Security Operations Center to ascertain, as quickly as possible, the individual's identity, whether they are already the subject of a terrorist or criminal investigation, or to analyze suspicious behavior that may signal some form of preoperational surveillance or activity.<sup>69</sup>

Our survey of Federal Security Directors at SPOT airports found a notable inconsistency in the rates at which BDOs at different airports contacted the Transportation Security Operations Center.<sup>70</sup> Developing additional guidance in the SPOT operating procedures could help improve consistency in the extent to which BDOs utilize Transportation Security Operations Center resources. Given the range of responses we received from SPOT airports about whether the BDOs contact the Transportation Security Operations Center to verify passenger identities and run their

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<sup>67</sup>[GAO/AIMD-00-21.3.1](#).

<sup>68</sup>Some details from our analysis were deleted because TSA considered them to be Sensitive Security Information.

<sup>69</sup>This information can be submitted about individuals whose suspicious activity resulted in BDO or LEO referral. See TSA's July 2008 Transportation Security Operations Center Privacy Impact Assessment.

<sup>70</sup>Some details of our survey results were deleted because TSA considered them to be Sensitive Security Information.

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names against terrorist and intelligence databases and the inconsistencies identified related to LEO responses to BDO requests for service, developing a standard mechanism and providing BDOs with additional guidance could help TSA achieve greater consistency in the SPOT process. Such a mechanism would provide designated TSA officials with a means of verifying passenger identities and help them determine whether a passenger was the subject of a terrorist or criminal investigation and thus posed a risk to aviation security.

Standards for internal control state that effectively using available resources, including key information databases, is one element of functioning internal controls.<sup>71</sup> In this connection, it is widely recognized among intelligence entities and police forces that a capability to “run” names against databases that contain criminal and other records is a potentially powerful tool to both identify those with outstanding warrants and to help discover an ongoing criminal or security-related incident. Additionally, TSA recommended in an April 2008 Organizational Business plan for its Office of Security Operations that the SPOT program should establish a mechanism and policy for allowing real-time checks of federal records for individuals whose behavior indicates they may be a threat to security.<sup>72</sup> The Office of Security Operations plan also states that BDOs should communicate the data to U.S. intelligence centers, with the purpose of permitting rapid communication of this information to local LEOs to take action. However, TSA officials told us that because of safety concerns, the Transportation Security Operations Center does not provide information from database checks directly to BDOs because BDOs are not LEOs, are unarmed, and do not have the training needed to deal with potentially violent persons.<sup>73</sup> If the mechanism discussed in the Office of

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<sup>71</sup>See [GAO/AIMD-00-21.3.1](#). For example, information should be recorded and communicated to management and others within the entity who need it and in a form and within a time frame that enables them to carry out their internal control and other responsibilities. Further, effective information technology management is critical to achieving useful, reliable, and continuous recording and communication of information.

<sup>72</sup>TSA, *Strategy Deployment, Organizational Business Plan, Office of Security Operations, Fiscal Year 2010* (Washington, D.C.: April 2008). According to TSA, the Office of Security Operations is the operational arm of TSA and employs the largest TSA workforce. It is responsible for airport checkpoint and baggage screening operations as well as other special programs designed to secure all assigned transportation modes.

<sup>73</sup>In March 2010, TSA told us that over the next 18 months, it will expand access to information classified up to the “Secret” level to an additional 10,000 TSA personnel, including all BDOs, all SPOT Transportation Security Managers (who are responsible for the local operations of the SPOT program and supervision of the BDOs), and all Supervisory TSOs (who directly supervise TSOs and the screening process).

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Security Operations business plan were implemented, it would allow the Transportation Security Operations Center to use BDO information to conduct real-time record checks of passengers and communicate the results to LEOs for action. Such a mechanism could increase the chances to detect ongoing criminal or terror plans.

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### TSA's Transportation Security Operations Center Does Not Use All Database Resources When Contacted

The final report of the National Commission on Terrorist Attacks Upon the United States (the "9/11 Commission Report") recommends that in carrying out its goal of protecting aviation, TSA should utilize the larger set of information maintained by the federal government, that is, the entire Terrorist Screening Database—the U.S. government's consolidated watch list that contains information on known or suspected international and domestic terrorists—as well as other government databases, such as intelligence or law enforcement databases.<sup>74</sup> However, the Transportation Security Operations Center is not using all the resources at its disposal to support BDOs in verifying potential risks to the aviation system. This reduces the opportunities to "connect the dots" that would increase the chances of detecting terrorist attacks in their planning stage, which the SPOT Privacy Impact Assessment states is when they are the most vulnerable.

According to TSA, the Transportation Security Operations Center has access to multiple law enforcement and intelligence databases that can be used to verify the identity of airline passengers; these include among others:<sup>75</sup>

1. the Selectee list, which identifies persons who must undergo enhanced screening at the checkpoint prior to boarding;
2. the No-Fly list,<sup>76</sup> which lists persons prohibited from boarding aircraft; and

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<sup>74</sup>The Terrorist Screening Database is the central terrorist watchlist consolidated by the FBI's Terrorist Screening Center and used by multiple agencies to compile their specific watchlists and for screening.

<sup>75</sup>The other databases available to TSA are omitted because TSA considered them to be Sensitive Security Information.

<sup>76</sup>The No-Fly list is used to identify individuals who should be prevented from boarding an aircraft. The No-Fly and Selectee lists contain applicable records from the FBI's Terrorist Screening Center consolidated database of known or suspected terrorists. Pursuant to Homeland Security Presidential Directive 6, dated September 16, 2003, the Terrorist Screening Center—operational since December 2003 under the administration of the FBI—was established to develop and maintain the U.S. government's consolidated terrorist

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3. the Terrorist Identity Datamark Environment terrorist list.<sup>77</sup>

TSA stated that the Transportation Security Operations Center checks passenger names submitted to it against these three databases if the passenger has been referred by a BDO to a LEO, but has not been arrested. Of the three databases that the Transportation Security Operations Center is to check in the case of a referral, passengers would have already been screened against two—the Selectee and No-Fly lists—in accordance with TSA passenger prescreening procedures when purchasing a ticket. The third database checked—the Terrorist Identity Datamark Environment—tracks terrorists but not persons wanted for other crimes. The FBI’s NCIC information system would contain names of such persons, but is not among the three databases checked for nonarrest referrals. If the passenger has been arrested, the Transportation Security Operations Center will run the passenger’s name against the additional law enforcement and intelligence databases available to it.

In addition, TSA told us that the Operations Center does not have direct electronic access to the Terrorist Screening Database and must call the FBI’s Terrorist Screening Center to provide it with a name to verify. TSA stated that this is done if a passenger’s identity could not be verified using the Operations Center databases. In effect, if a passenger has been referred to a LEO, but not arrested, the Operations Center is to check the three databases shown above to verify the passenger’s identity. If a passenger has been arrested, but the three databases do not list the person, the Center can check the additional databases available to it. If none of these databases can verify the person’s identity, the Operations Center can contact the Terrorist Screening Center by telephone to request further screening.

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screening database (the watch list) and to provide for the use of watch-list records during security-related screening processes. See [GAO-08-136T](#), *Aviation Security: TSA Is Enhancing Its Oversight of Air Carrier Efforts to Screen Passengers against Terrorist Watch-List Records, but Expects Ultimate Solution to Be Implementation of Secure Flight* (Washington, D.C.: Sept. 9, 2008).

<sup>77</sup>According to DHS, the Terrorist Identity Datamark Environment is the database maintained by the National Counterterrorism Center—the primary organization in the U.S. government for integrating and analyzing intelligence pertaining to terrorism and counterterrorism—to serve as a central repository for all information on known or suspected international terrorists with the exception of purely domestic terrorism information. See, DHS, Office of Inspector General, *The DHS Process for Nominating Individuals to the Consolidated Terrorist Watchlist* (Washington, D.C.: February 2008).

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For passengers who have risen to the level of a LEO referral at an airport checkpoint, having the Transportation Security Operations Center consistently check their names against all the databases available to it could potentially help TSA identify threats to the aviation system and aid in “connecting the dots.” TSA indicated that there are no obstacles to rapidly checking all databases rather than the three listed. We did not analyze the extent to which the law enforcement and intelligence databases available to TSA may contain overlapping information.

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## TSA Lacks Program Effectiveness Measures for SPOT but Is Taking Steps to Improve Evaluation Capabilities

TSA has established some performance measures by tracking SPOT referral and arrest data, but lacks the measures needed to evaluate the effectiveness of the SPOT program and, as a result, has not been able to fully assess SPOT’s contribution to improving aviation security. TSA emphasized the difficulty of developing performance measures for deterrence-based programs, but stated that it is developing additional measures to quantify the effectiveness of the program. The SPOT program uses teams to assess BDO proficiency, provide individual and team guidance, and address issues related to the interaction of BDOs with TSA checkpoint personnel. However, TSA does not systematically track the teams’ recommendations or the frequency of the teams’ airport visits. TSA states that it is working to address these issues and plans to do so by the end of fiscal year 2010.

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## TSA Has Taken Action to Collect Data for Some Performance Measures, but Work Remains to Assess Progress Towards Achieving Strategic Goals

TSA agreed that the SPOT program lacked sufficient performance measures in the past, but stated that it has some performance measures in place including tracking data on passengers referred for additional screening and the resolution of this screening, such as if prohibited items were found or if law enforcement arrested the passenger and the reason for the arrest. TSA is also working to improve its evaluation capabilities to better assess the effectiveness of the program. DHS’s NIPP, internal controls standards, and our previous work on program assessment state that performance metrics and associated program evaluations are needed to determine if a program works and to identify adjustments that may improve its results.<sup>78</sup> Moreover, standard practices in program management for defining, designing, and executing programs include

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<sup>78</sup>DHS, *National Infrastructure Protection Plan: Partnering to Enhance Protection and Resiliency* (Washington, D.C.: 2009); GAO/AIMD-00-21.3.1; and GAO, *Performance Measurement and Evaluation: Definitions and Relationships*, GAO-05-739SP (Washington, D.C.: May 2005).

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developing a road map, or program plan, to establish an order for executing specific projects needed to obtain defined programmatic results within a specified time frame.<sup>79</sup> Congress also needs information on whether and in what respects a program is working well or poorly to support its oversight of agencies and their budgets; and agencies' stakeholders need performance information to accurately judge program effectiveness.<sup>80</sup> For example, in the Senate Appropriations Committee report accompanying the fiscal year 2010 DHS appropriations bill,<sup>81</sup> the committee noted that while TSA has dramatically increased the size and scope of SPOT, resources were not tied to specific program goals and objectives. In addition, the conference report accompanying the fiscal year 2010 DHS appropriations act requires TSA to report to Congress, within 60 days of enactment, on the effectiveness of the program in meeting its goals and objectives, among other things.<sup>82</sup> This report was completed on March 15, 2010.

Although TSA tracks data related to SPOT activities including prohibited items, law enforcement arrests related to SPOT referrals, and reasons for the arrests (output measures), it has not yet developed measures to gauge SPOT's effectiveness in meeting TSA strategic goals (outcome measures), such as identifying individuals who may pose a threat to the transportation system.<sup>83</sup> OMB encourages the use of outcome measures because they are more meaningful than output measures, which tend to be more process-oriented or means to an end.<sup>84</sup> For example, TSA's Assistant General

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<sup>79</sup> The Project Management Institute, *The Standard for Program Management*© (2006).

<sup>80</sup> GAO, *Executive Guide: Effectively Implementing the Government Performance and Results Act*, [GAO/GGD-96-118](#) (Washington, D.C.: June 1996).

<sup>81</sup> See S. Rep. No. 111-31, at 56-57 (2009); see also S. Rep. No. 110-396, at 59 (2008).

<sup>82</sup> See H.R. Rep. No. 111-298, at 77 (2009) (Conf. Rep.). The report further directs that GAO review the report submitted by TSA and provide its findings to the committees no later than 120 days after the SPOT report is submitted to the committees.

<sup>83</sup> Output measures help determine the extent to which an activity was performed as planned. Outcome-related measures are more robust measures because they provide a more comprehensive assessment of the success of the agency's efforts, as stated in DHS's 2009 NIPP.

<sup>84</sup> OMB and the Council for Excellence in Government, *Performance Measurement Challenges and Strategies* (Washington, D.C.: June 18, 2003).

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Manager for the Office of Operation Process and Performance Metrics<sup>85</sup> told us that SPOT staffing levels are currently used as one performance metric. The official said that since the SPOT is an added layer of security, additional SPOT staffing would add to security effectiveness. While staffing levels may help gauge how fast the program is growing, they do not measure the effectiveness in meeting strategic goals.

Similarly, TSA also cited the number of prohibited items discovered by BDOs in SPOT metrics reports as a measure of program success.<sup>86</sup> However, TSA told us that possession of a prohibited item is often an oversight and not an intentional act; moreover, other checkpoint screening layers are intended to find such items, such as the TSOs and the property screening equipment.<sup>87</sup> TSA also cited measures of BDO job performance as some of the existing measures of program effectiveness, but noted that these are “pass/fail” assessments of individual BDOs, rather than overall program measures.

TSA notes that one purpose of the SPOT program is to deter terrorists, but that proving that it has succeeded at deterring terrorists is difficult because the lack of data has presented challenges for the SPOT program office when developing performance measures. We agree that developing performance measures, especially outcome measures, for programs with a deterrent focus is difficult. Nevertheless, such measures are an important tool to communicate what a program has accomplished and provide information for budget decisions. TSA uses proxy measures—indirect measures or indicators that approximate or represent the direct measure—to address deterrence, other security goals, or a combination of both. For example, TSA tracks the number of prohibited items found and individuals arrested as a result of SPOT referrals. According to OMB, proxy measures are to be correlated to an improved security outcome, and the program should be able to demonstrate—such as through the use of

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<sup>85</sup>The Office’s primary work involves metrics infrastructure; it assists TSA programs, if requested, in developing applications to track quantitative measures, such as surrendered items. It also tracks data for its Management Objectives Report related to three areas: employees, security effectiveness, and efficiency.

<sup>86</sup>The types of prohibited items found have included knives, guns, gun ammunition, certain chemicals, strike-anywhere matches, and certain liquids/gels/aerosols; other illegal items discovered include narcotics and fraudulent identity documents.

<sup>87</sup>According to TSA, TSOs focus on detecting high-risk threats which have the ability to cause catastrophic damage to an airplane in flight (e.g., explosives).

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modeling—how the proxies tie to the eventual outcome.<sup>88</sup> In using a variety of proxy measures, failure in any one of the identified measures could provide an indication on the overall risk to security. However, developing a plan that includes objectives, milestones, and time frames to develop outcome-based performance measures could better position TSA in assessing the effectiveness of the SPOT program.

With regard to more readily quantifiable output performance measures, such as the number of referrals by BDOs, or the ratio of arrests to referrals, TSA was limited in its ability to analyze the data related to these measures. The SPOT database includes information on all passengers referred by BDOs for additional SPOT screening including the behaviors of the passengers that led to the additional screening, as well as the resolution of the screening process (e.g., no further action taken, law enforcement notification, law enforcement investigation, arrested, and reason for arrest). However, TSA reported that any analysis of the data had to be done manually.<sup>89</sup>

In March 2010, TSA migrated the SPOT referral data to its Performance Management Information System, allowing for more statistical and other analyses. According to TSA, migrating the SPOT referral database will enhance the SPOT program’s analytic capabilities. For example, TSA stated that it would be able to conduct trend analyses, better segregate data, and create specific reports for certain data. This includes better tracking of performance data at specific airports, analyzing by categories of airports (threat or geographic location), and tracking the performance data of individual BDOs, such as number of referrals, number of arrests, arrest to referral ratios, and other analyses. However, since these changes to the database were not complete at the time of our audit, we could not assess whether the problems we identified with the database had been corrected.

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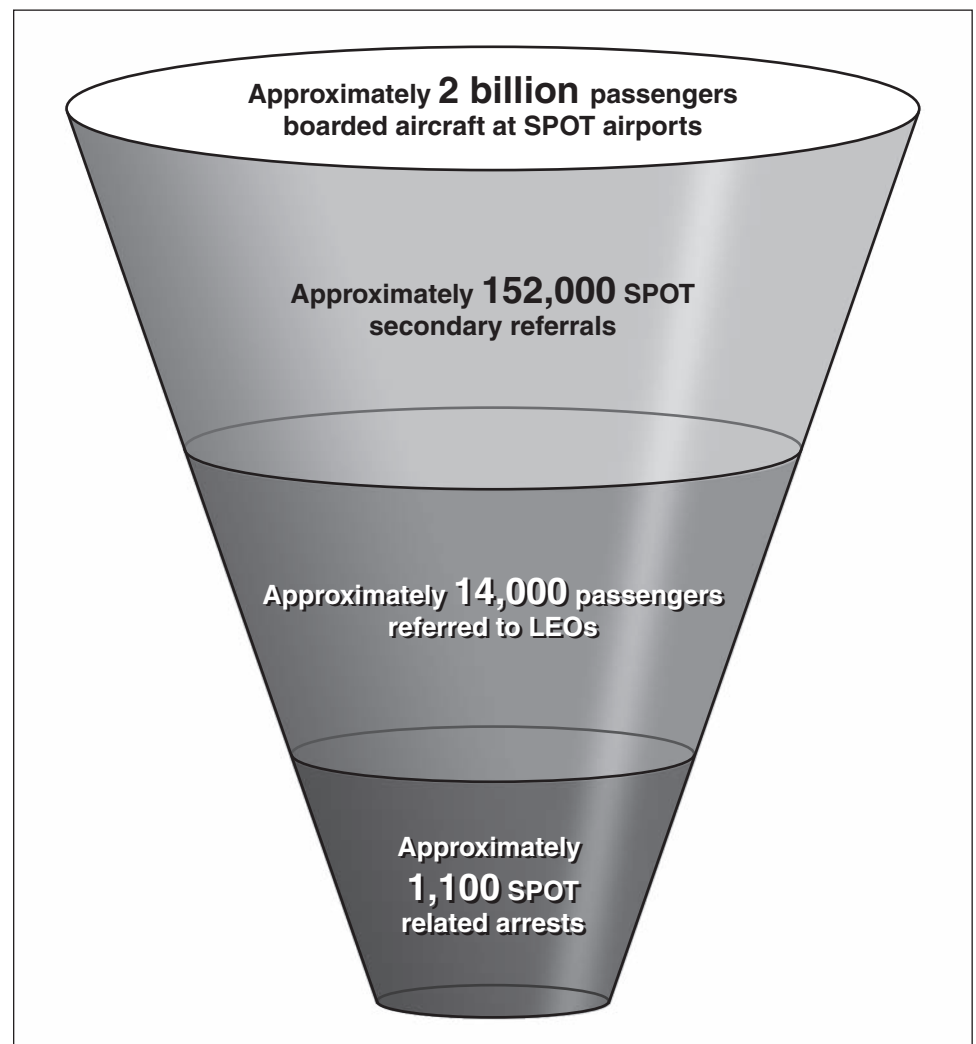
<sup>88</sup>OMB and the Council for Excellence in Government, *Performance Measurement Challenges and Strategies* (Washington, D.C.: June 18, 2003).

<sup>89</sup>We also found that the SPOT referral database had a number of weaknesses. TSA designated our discussion of these weakness as sensitive security information.

Over 4 Years, SPOT Resulted in About 1,100 Arrests Out of Almost 14,000 Referrals to Law Enforcement

The SPOT referral database records the total number of SPOT referrals since May 29, 2004, how many were resolved, how many passengers BDOs referred to LEOs, the recorded reasons for the referral, and how many referrals led to arrests, among other things. As shown in figure 4, we analyzed the SPOT referral data for the period May 29, 2004, to August 31, 2008.

Figure 4: Passenger Boardings at SPOT Airports, May 29, 2004, through August 31, 2008



Source: GAO analysis of TSA and Bureau of Transportation Statistics data.

Note: Figure 4 is not drawn to scale.

Figure 4 shows that approximately 2 billion passengers boarded aircraft at SPOT airports from May 29, 2004, through August 31, 2008.<sup>90</sup> Of these, 151,943 (less than 1/100<sup>th</sup> of 1 percent) were sent to SPOT referral screening, and of these, 14,104 (9.3 percent) were then referred to LEOs. These LEO referrals resulted in 1,083 arrests, or 7.6 percent of those referred, and less than 1 percent of all SPOT referrals (0.7 percent of 151,943).

We also analyzed the reasons for arrests resulting from SPOT referrals, for the May 29, 2004, through August 31, 2008, period. Table 2 shows, in descending order, the reasons for the arrests.

**Table 2: Reasons for Arrests from SPOT Referrals, May 29, 2004 through August 31, 2008**

Reasons for arrest	Number	Percentage
Illegal alien	427	39
Outstanding warrants	209	19
Possession of fraudulent documents	166	15
Other	128	12
Possession of suspected drugs	125	12
No reason given	16	1
Undeclared currency	8	1
Suspect documents	4	0
<b>Total</b>	<b>1,083</b>	<b>99<sup>a</sup></b>

Source: TSA, SPOT referral database from period of May 29, 2004, through August 31, 2008.

<sup>a</sup>Total does not add to 100 percent due to rounding.

While SPOT personnel did not determine a specific reason for arrest for 128 cases categorized as “other” or 16 other cases categorized as “no reason given,” our analysis of the SPOT database found that a specific reason for arrest could have been determined for these cases by using the LEO resolution notes included in the database. For example, we identified 43 additional arrests related to fraudulent documents, illegal aliens, and suspect documents, among others. The remaining 101 arrests originally characterized as “other” or “no reason given” included arrests for reasons

<sup>90</sup>Our estimate of the total number of passengers who went through checkpoints is based on Bureau of Transportation Statistics data that we obtained for the airports at which SPOT was deployed during this period. Some figures were rounded.

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such as intoxication, unruly behavior, theft, domestic violence, and possession of prohibited items. Many of the arrests resulting from BDO referrals would typically fall under the jurisdiction of various local, state, and federal agencies and are not directly related to threats to aviation security. For example, the 427 individuals arrested as illegal aliens, and the 166 arrested for possession of fraudulent documents, are subject to the enforcement responsibilities shared by U.S. Immigration and Customs Enforcement (ICE) and CBP. Although outstanding warrants and the possession of fraudulent or suspect documents could be associated with a terrorist threat, TSA officials did not identify any direct links to terrorism or any threat to the aviation system in any of these cases.

According to TSA, anecdotal examples of BDO actions at airports show the value added by SPOT to securing the aviation system. However, because the SPOT program has not been scientifically validated, it cannot be determined if the anecdotal results cited by TSA were better than if passengers had been pulled aside at random, rather than as a consequence of being identified for further screening by BDOs. Some of the incidents cited by TSA include the following.

- A BDO referred two passengers who were traveling together to referral screening due to suspicious behavior. During secondary screening, one passenger presented fraudulent travel documents. The other could not produce any documentation of his citizenship and it was determined he was in the United States illegally. ICE responded and interviewed both passengers. ICE stated one passenger was also in possession of \$10,000 dollars which alarmed positive for narcotics when swept by a K-9 team. ICE arrested one passenger on a federal charge of possession of fraudulent identification documents and entry without inspection. ICE stated charges are still pending for the possession of \$10,000. The second passenger was charged with a federal charge of entry without inspection.
- A BDO referred a passenger to referral screening for exhibiting suspicious behavior. Port Authority of Portland (Oregon) Police responded and interviewed the passenger who did not give a statement. LEOs conducted an NCIC check which revealed that there was an outstanding warrant for the failure to appear for a theft charge. LEOs arrested the passenger on a state charge for an outstanding warrant for the failure to appear for theft.
- A BDO referred a passenger for referral screening due to suspicious behavior. During the referral, the passenger admitted that he was unlawfully present in the United States. The Orlando (Florida) Police Department and CBP responded and interviewed the passenger who stated he had \$100,000 in his checked baggage, which was confirmed

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by CBP. The passenger was arrested on a federal charge of illegal entry.

Because these are anecdotal examples, they cannot be used to reliably generalize about the SPOT program's overall effectiveness or success rate. Our analysis of the SPOT referral database found that the referral data do not indicate if any of the passengers sent to referral screening, or those arrested by LEOs after being referred to them, intended to harm the aircraft, its passengers, or other components of the aviation system. Additionally, SPOT officials told us that it is not known if the SPOT program has ever resulted in the arrest of anyone who is a terrorist, or who was planning to engage in terrorist-related activity.

#### Reviewing Airport Video Recordings of Individuals Later Arrested or Who Pleaded Guilty for Engaging in Terrorism-Related Activities Could Help TSA Better Identify Terrorist-Related Behaviors

Studying airport video recordings of the behaviors exhibited by persons waiting in line and moving through airport checkpoints and who were later charged with or pleaded guilty to terrorism-related offenses could provide insights about behaviors that may be common among terrorists or could demonstrate that terrorists do not generally display any identifying behaviors. TSA officials agreed that examining video recordings of individuals who were later charged with or pleaded guilty to terrorism-related offenses, as they used the aviation system to travel to overseas locations allegedly to receive terrorist training or to execute attacks, may help inform the SPOT program's identification of behavioral indicators. In addition, such images could help determine if BDOs are looking for the right behaviors or seeing the behaviors they have been trained to observe.

Using CBP and Department of Justice information, we examined the travel of key individuals allegedly involved in six terrorist plots that have been uncovered by law enforcement agencies.<sup>91</sup> We determined that at least 16 of the individuals allegedly involved in these plots moved through 8 different airports where the SPOT program had been implemented.<sup>92</sup> Six

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<sup>91</sup>The analysis included only flights leaving the United States. Department of Justice data show that more than 400 individuals have been convicted in the United States for terrorism-related offenses since September 11, 2001. We did not examine the travel itineraries of all these individuals.

<sup>92</sup>The events included the Mumbai, India attack of 2008; a plot to attack the Quantico, Virginia, Marine base in 2008; an effort by five Americans to receive training and fight in Pakistan in December 2009; a plot to attack infrastructure in New York City in 2009; an effort to provide men and support for terrorists in Somalia in 2008; and an attack on a U.S. base in Afghanistan by an American who received training in Pakistan. We were unable to confirm whether BDOs were stationed at the checkpoints used by these individuals at the time they traveled.

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of the 8 airports were among the 10 highest risk airports, as rated by TSA in its Current Airport Threat Assessment. In total, these individuals moved through SPOT airports on at least 23 different occasions. For example, according to Department of Justice documents, in December 2007 an individual who later pleaded guilty to providing material support to Somali terrorists boarded a plane at the Minneapolis-Saint Paul International Airport en route to Somalia to join terrorists there and engage in jihad. Similarly, in August 2008 an individual who later pleaded guilty to providing material support to Al-Qaeda boarded a plane at Newark Liberty International Airport en route to Pakistan to receive terrorist training to support his efforts to attack the New York subway system.

Our survey of Federal Security Directors at 161 SPOT airports indicated most checkpoints at SPOT airports have surveillance cameras installed. As we previously reported, best practices for project management call for conducting feasibility studies to assess issues related to technical and economic feasibility, among other things.<sup>93</sup> In addition, Standards for Internal Control state that effectively using available resources is one element of functioning internal controls.<sup>94</sup> TSA may be able to utilize the installed video infrastructure at the nation's airports to study the behavior of persons who were later charged with or pleaded guilty to terrorism-related offenses, and determine whether BDOs saw the behaviors. The Director of Special Operations in TSA's Office of Inspection told us that video recordings could be used as a teaching tool to show the BDOs which behaviors or activities they did or did not observe. In addition, TSA indicated that although the airports may have cameras at the security screening checkpoints, the cameras are not owned by TSA, and in many cases, they are not accessible to TSA. However, TSA officials lack information on the scope of these potential limitations because prior to our work TSA did not have information on the number of checkpoints equipped with video surveillance. We obtained this information as part of our survey of Federal Security Directors at SPOT airports. While TSA officials noted several possible limitations of the use of the existing video surveillance equipment, these images provide TSA a means of acquiring information about terrorist behaviors in the checkpoint environment that

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<sup>93</sup>See, GAO, *Supply Chain Security: Feasibility and Cost-Benefit Analysis Would Assist DHS and Congress in Assessing and Implementing the Requirement to Scan 100 Percent of U.S.-Bound Containers*, GAO-10-12 (Washington, D.C.: Oct. 30, 2009). The Project Management Institute, *A Guide to the Project Management Body of Knowledge*.

<sup>94</sup>GAO/AIMD-00-21.3.1.

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is not available elsewhere. If current research determines that the SPOT program has a scientifically validated basis for using behavior detection for counterterrorism purposes in the airport environment, then conducting a study to determine the feasibility of using images captured by video cameras could better position TSA in identifying behaviors to observe.

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### Standardization Teams Assess BDO Proficiency in SPOT Activities and Provide Guidance and Mentoring to BDOs

TSA sends standardization teams to SPOT airports on a periodic basis to conduct activities related to quality control. Teams observe SPOT operations at an airport for several days, working side by side with the BDOs, on multiple shifts, observing their performance, offering guidance, and providing training when required. According to TSA, the purpose of a standardization team visit is to provide operational support to the BDOs, which includes additional training, mentoring, and guidance to help maintain a successful SPOT program.

The standardization teams are comprised of at least two G-Band, or Expert<sup>95</sup> BDOs who have received an additional week of training on SPOT behaviors and mentoring skills. SPOT officials stated that the SPOT program uses its standardization teams to assess overall BDO proficiency by observing BDOs, reviewing SPOT score sheet data, and other relevant data. Standardization teams may also provide a Behavior Observation and Analysis review class to refresh BDOs if the team determines that such a class is needed. The SPOT program director also said that the standardization teams aim to monitor the airport's compliance with the SPOT program's Standard Operating Procedures. As part of this mentoring approach, the standardization teams provide individual and team guidance to the BDOs, offer assistance in program management, and cover issues related to the interaction of BDOs with other TSA checkpoint personnel.

TSA reported to us that it does not systematically track the standardization teams' recommendations or the frequency of the teams' airport visits. Standards for Internal Control state that programs should have controls in place to assess the quality of performance over time and ensure that the findings of audits and other reviews are promptly resolved. Managers are to (1) promptly evaluate findings from audits and other reviews, including those showing deficiencies and recommendations

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<sup>95</sup>G-Band, or Expert BDOs, have advanced to a lead role, are able to provide technical expertise on the SPOT program, and are one band away from a supervisory role.

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reported by auditors and others who evaluate agencies' operations; (2) determine proper actions in response to findings and recommendations from audits and reviews; and (3) complete, within established time frames, all actions that correct or otherwise resolve the matters brought to management's attention.<sup>96</sup> Although the standardization teams may provide an airport Federal Security Director with recommendations on how to improve SPOT operations, the SPOT program director stated that Federal Security Directors are not required to document whether they have implemented the team recommendations. TSA officials told us that standardization teams can follow up on recommendations made during previous visits. However, TSA did not track whether corrective actions were implemented or the frequency of the team's airport visits to ensure the implementation of the airport's SPOT program. TSA officials stated that they are currently examining ways to compile data to address this issue, and expect to have a system in place in fiscal year 2010.

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## TSA Developed and Deployed SPOT Training but Further Action Could Enhance Its Effectiveness

Although TSA has taken steps to incorporate all four elements of an effective training program by planning, designing, implementing, and evaluating training for BDOs, further action could help enhance the training's effectiveness. TSA initially consulted outside experts for help in the training's development, which began as a half-day course and has grown to include classroom, on-the-job, and advanced training. TSA also has efforts underway to improve its training program, such as the deployment of SPOT recurrent training. However, TSA evaluations of SPOT program instructors found mixed quality among them, from 2006 onwards. Additionally, TSA has ongoing plans to evaluate the SPOT training for effectiveness, but has not yet developed time frames and milestones for completing the evaluation.

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## TSA Has Taken Actions to Develop and Deploy SPOT Training

### TSA's SPOT Training Evolved Over Time

In 2003, TSA officials at Boston Logan International airport developed the initial half-day training course for SPOT based on an existing course developed for the Massachusetts State Police. Their goal was to take the

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<sup>96</sup>GAO/AIMD-00-21.3.1.

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behavior detection program designed for law enforcement and apply it to screeners at airport checkpoints. According to TSA officials at Boston Logan, after they recognized that the lecture-style course they originally designed was not effective, they tasked an instructional system designer from TSA's Workplace Performance and Training (the former name of TSA's Operational and Technical Training Division)<sup>97</sup> and an industrial psychologist from the Office of Human Capital to redesign and expand the course, which was piloted in 2005. The 2007 SPOT strategic plan included training objectives for the SPOT program as follows:

- reviewing existing behavior observation training providers,
- establishing and prioritizing multimodal training and assistance efforts based on threat assessments and critical infrastructure,
- establishing a Center of Excellence for Behavior Detection Program training that would continually enhance the quantity and quality of training to selected candidates, and
- developing a recurrent training program designed to refresh and hone skills needed for an effective Behavior Detection Program.

Since that time, the SPOT program implemented, or is in the process of implementing, some of these objectives. For example, in 2008, as part of its effort towards establishing a center for excellence in behavior detection training (third objective), the SPOT program participated in a meeting with behavior detection training officials from various DHS components facilitated by DHS's Screening Coordination Office to promote the sharing of information about behavior detection training and foster future collaboration. Additionally, the SPOT program worked with TSA's Operational and Technical Training Division to create a recurrent training component for BDOs (fourth objective). For example, in 2008, the SPOT program office added a course on detecting microfacial expressions called Additional Behavior Detection Techniques.<sup>98</sup> This 3-day course builds on the behavior detection skills taught in basic training, by teaching

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<sup>97</sup>TSA's Operational and Technical Training Division, within the Office of Security Operations, provides assistance with development and implementation of technical training for screening, Behavior Detection Officers, Bomb Appraisal Officers, the Aviation Direct Access Screening Program, and technical management training.

<sup>98</sup>In May 2009, the title of the course was changed to "Additional Behavior Detection Techniques" because ABDT is actually a supplemental tool for BDOs to use during the Casual Conversation phase of SPOT Referral Screening. The course was formerly titled "Advanced Behavior Detection Techniques." Microfacial expressions are very brief facial expressions that can last as little as 1/25 of a second.

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TSA Consulted with Some Experts on Developing SPOT Training

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BDOs how to detect microfacial expressions. After pilot testing, the course began implementation nationwide in January 2009.

In developing an effective training program, we previously reported that consultation with subject matter experts and expert entities is a core characteristic of the strategic training and development process.<sup>99</sup> TSA SPOT program staff told us that they consulted with experts on behavior detection and observed existing behavior detection courses before deploying the SPOT training program. According to SPOT program officials, a TSA staff member from Boston Logan International Airport attended other training programs offered by other federal agencies and private training organizations to inform the design of SPOT training.<sup>100</sup> TSA officials told us that information from the training courses was used to help develop the list of behaviors or “stress elevators” for the program, and that the point system used to identify passengers for referral screening was based in part on consultations with several subject-matter experts.

TSA documentation also notes that a SPOT working group created in February 2004 consulted with the FBI’s Behavioral Science Unit.<sup>101</sup> The Behavioral Science Unit specializes in developing and facilitating training, research, and consultation in the behavioral sciences for the FBI, law enforcement, intelligence, and military communities. While TSA officials from Boston Logan told us that the FBI was included in this initial SPOT working group, these officials agree that coordination with the FBI lapsed until June 2009 when the SPOT Program Office reengaged with the Behavioral Science Unit, and held a meeting with the unit at the FBI Academy in Quantico, Virginia. Since that meeting, a subject matter expert from the SPOT Program Office has been invited to be a member of

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<sup>99</sup>GAO, *Human Capital: A Guide for Assessing Strategic Training and Development Efforts in the Federal Government*, GAO-04-546G (Washington, D.C.: Mar. 1, 2004).

<sup>100</sup>The TSA staff member attended the following external training courses: John Reid and Associates’ Reid Techniques of Interrogation and Advanced Reid Techniques of Interrogation; Massachusetts State Police Academy’s Basic Investigations and Professional Development Program Interview Techniques; International Security Defense Systems’ Verification Agent for Virgin Atlantic Security Systems; New Mexico Technology, Materials and Research Center’s Prevention and Response to Suicide Bomber Indicators; Abraxis Corporation’s Detecting Deception and Eliciting Response; Langevin Learning Services’ Instructional Techniques for New Instructors; Ekman Group’s Understanding Emotions and Detecting Truth; Chameleon Associates’ Suspicious Behavior Detection; and Federal Transit Administration’s Terrorist Awareness, Recognition, and Response.

<sup>101</sup>The purpose of the SPOT working group was to help refine the list of SPOT behaviors and to develop standard operating procedures and a concept of operations for the program.

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the Terrorism Research and Analysis Project, which is an ongoing working group sponsored by the unit.

In July 2008, DHS's Screening Coordination Office facilitated a collaborative discussion on behavior detection that included TSA, CBP, and Secret Service officials to better ensure that components within DHS share information regarding their efforts in behavior detection and provide a forum for components to have an informed and collaborative discussion on current capabilities, best practices, and lessons learned. According to TSA, no further contact has occurred between the DHS Behavior Detection Working Group and the SPOT program. Thus, the extent to which the working group's expertise will be used to refine or augment SPOT training in the future is not yet clear.

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### SPOT Program Office Recently Deployed Recurrent Training

Along with basic and remedial training required by the Aviation and Transportation Security Act, TSA policy requires its screening force to regularly complete recurrent (refresher) training. TSA recognized that ongoing training of screeners on a frequent basis and effective supervisory training are critical to maintaining and enhancing skills learned during basic training. According to agency officials, TSA is currently working with DHS S&T to determine the necessary frequency for refresher training for each training course within the SPOT program. Furthermore, TSA plans to place BDOs under TSA's Performance and Accountability Standards System (PASS) beginning in fiscal year 2010. This will include a recertification module.

In 2008, the SPOT program office began the process for developing recurrent SPOT training. Our internal control standards and training assessment guidance suggest that such refresher training should be considered integral to an effective training program from the start because work conditions and environments can be expected to change over time, and additional or updated training is essential to ensuring that the program mission continues to be accomplished.<sup>102</sup> According to the SPOT program office, the recently deployed recurrent training will be semiannual. TSA's Operational and Technical Training Division initially planned to pilot test recurrent training in April 2009 followed by full implementation of the course in approximately May 2009. Because the Operational and Technical Training Division focus was shifted to completing the revisions

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<sup>102</sup>[GAO/AIMD-00-21.3.1](#) and [GAO-04-546G](#).

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for the SPOT basic certification course, recurrent training was delayed until September 2009 when they released the training on TSA's Online Learning Center.

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### Instructor Evaluations Found Mixed Quality; Issues with Program Management Led to Instructor Retraining

Our previous work on elements of effective training states that instructors must be both knowledgeable about the subject matter and issues involved, as well as able to effectively transfer these skills and knowledge to others.<sup>103</sup> Moreover, internal control standards state that all personnel need to possess and maintain a level of competence that allows them to accomplish their assigned duties.<sup>104</sup> Management needs to identify appropriate knowledge and skills needed for various jobs and provide needed training, as well as to ensure that those teaching the skills are themselves competent.

TSA conducted internal assessments of SPOT instructors episodically from 2006 through March 2008. These assessments involved a few instructors being rated at a time, and found a wide range of competency among the instructors. In January 2009, TSA's Office of Inspections and Investigations began an investigation of the SPOT training manager, who resigned shortly thereafter. TSA investigators determined that the training manager and other trainers had created a hostile training environment that intimidated some trainees. To address this problem, TSA stated that the program office reexamined the SPOT training program nationally. This included recertifying 47 of 54 SPOT instructors in March 2009, which included evaluation by TSA's Office of Human Capital, Quality Assurance assessors. Additionally, in July 2009, TSA centralized SPOT training at five permanent, regional training facilities in Orlando, Florida; Houston, Texas; Phoenix, Arizona; Denver, Colorado; and Philadelphia, Pennsylvania.<sup>105</sup> According to the SPOT program director, this will allow the SPOT program office more oversight over training. Previously, training was provided at individual airports.

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<sup>103</sup>[GAO-04-546G](#).

<sup>104</sup>[GAO/AIMD-00-21.3.1](#).

<sup>105</sup>The SPOT program retains the discretion to train BDOs at a site other than one of the five training facilities if it is more fiscally responsible to do so. For example, if there are 15 BDO candidates at a single airport, the SPOT program will train them at that airport rather than sending them to a training facility.

After the March 2009 recertification training, ratings scores of SPOT instructors showed less variation than did previous ratings. We reviewed the quality assurance instructor evaluations of two SPOT instructors conducted by TSA's Office of Human Capital, Training Standards and Evaluation Branch, and the 167 SPOT program instructor evaluations of 54 SPOT instructors conducted by the SPOT program office and TSA's Operational and Technical Training Division since the program started in October 2006.<sup>106</sup> After the recertification training, 93 percent of instructors were rated as exceeding expectations, compared to 30 percent in the 2006 to September 2008 ratings. Table 3 shows the ratings of instructors for March 2009 compared to the period of 2006 to September 2008.<sup>107</sup>

**Table 3: SPOT Instructor Evaluation Ratings, 2006 to September 2008, and March 2009**

Number of instructor evaluations	Unsatisfactory (0-74%)		Needs improvement (75-84%)		Meets expectations (85-94%)		Exceeds expectations (95-100%)		No numeric score given	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
2006 - Sept 2008	73	3 4%	5 7%	36 49%	22 30%	7 10%				
March 2009	94	0 0%	1 1%	6 6%	87 93%	0 0%				

Source: GAO analysis of TSA Quality Assurance Instructor Evaluations for SPOT.

In addition to the variation in numeric scores and rating levels for the 2006 to September 2008 period, as shown in table 3, we found substantial variation in the comments about instructor competency for the same

<sup>106</sup>Some SPOT instructors have been evaluated multiple times. While the SPOT program office provided us with print or electronic copies of all SPOT instructor evaluations, some forms contained only numeric ratings and no written comments; others had no numeric scores. Because instructor names were redacted from the evaluations, the numbers may include duplicates. Additionally, the evaluations containing written comments were not always filled out using complete sentences, making it difficult to ascertain the rater's assessment of the instructor.

<sup>107</sup>SPOT Instructors are evaluated using a Quality Assurance Instructor Evaluation, TSA Form 1909. Using this form, the evaluator assigns either 0 (zero) points, 0.5 points, or 1 point for each of 57 ratable items depending on whether the instructor meets the standard as written, needs improvement to meet the standard, or does not meet the standard. The total points are then entered into a formula that generates a percentage. This percentage is used to determine the overall rating. Instructors receiving a score of 95 percent to 100 percent are rated as exceeds expectations; 85 percent to 94 percent are rated as meets expectations; 75 percent to 84 percent are rated as needs improvement; and 0 percent to 74 percent are rated as unsatisfactory.

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period. For example, in 32 out of 74 instructor evaluation forms that we reviewed where comments were made about the instructor prior to 2009, the comments ranged from superb to needs more experience as an instructor, as well as needs more time performing the job as a BDO to be able to teach others. In the comments on an instructor who was rated as “meets expectations,” the instructor was described as having “limited experience within the SPOT program,” that this was “a major concern,” and it was recommended that the instructor spend as much time as possible functioning as a BDO. In other cases, however, SPOT instructors were described as competent, solid, and outstanding. For example, one instructor who received a rating of “exceeds expectations” was described as a superb instructor who “is a valued member of the National Training Team.” As noted above, following the March 2009 recertification training, 93 percent of the instructors received a rating of “exceeds expectations” with only 1 percent “needing improvement.” Of the 94 instructor evaluations completed in March 2009, 82 contained written comments. Of these, multiple SPOT instructors were described as excellent, knowledgeable, and effective. For example, an instructor who received a rating of “exceeds expectations” was noted as demonstrating a high degree of material knowledge and great presentation skills. TSA attributed the increase in instructor ratings to two factors. The first is low turnover among SPOT instructors, which allows instructors to hone both their technical and instructor skills. The second factor cited by TSA is that TSA conducted a 2-day instructor refresher training immediately prior to the evaluations in March 2009. To ensure all instructors were reevaluated within a specific time frame, evaluations were scheduled and conducted in a controlled environment. Instructors knew in advance they were going to be evaluated and delivered modules of the BDO certification course to other BDO instructors.

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### TSA Has Taken Some Action, but Has Not Evaluated the SPOT Training Program for Effectiveness

We previously reported that evaluation is an integral part of training and development efforts, and that agencies need to systematically plan for and evaluate the effectiveness of training and development.<sup>108</sup> Employing systematic monitoring and feedback processes can help by catching potential problems at an early stage, thereby saving valuable time and resources that a major redesign of training would likely entail. Similarly, in 2006, TSA’s Operational and Technical Training Division issued general evaluation standards for training programs, stating that training programs

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<sup>108</sup>[GAO-04-546G](#).

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should be comprehensively evaluated on a periodic basis to identify program strengths and weaknesses.<sup>109</sup> Moreover, standard practices in program management for defining, designing, and executing programs include developing a road map, or program plan, to establish an order for executing specific projects needed to obtain defined programmatic results within a specified time frame.<sup>110</sup>

The former SPOT training manager told us that the SPOT program internally evaluates the effectiveness of SPOT training through the job knowledge tests that BDO candidates must pass following the classroom portion of the training and the SPOT Proficiency/On-the-Job Training Checklist following the on-the-job portion of the training. Furthermore, the former training manager told us that TSA knows that the SPOT training is effective because BDOs are able to recognize behaviors at the checkpoint, and because of BDOs' demonstrated ability to identify criminals—such as drug couriers or people with outstanding arrest warrants—through the screening process.

Although TSA has not conducted a comprehensive analysis of the effectiveness of the SPOT training program, TSA's Office of Human Capital, Training Standards and Evaluation Branch conducted training evaluations to assess how students use what they were taught in the SPOT basic training course. Specifically, from July through September 2008, the Training Standards and Evaluation Branch conducted evaluations at 5 of the 161 airports where the SPOT program is currently operating. Based on BDO feedback at the 5 airports, the Training Standards and Evaluation Branch's final report contained a series of recommendations for improving the SPOT training program. These recommendations and TSA's actions to address them are summarized in table 4.

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<sup>109</sup>TSA, Operational and Technical Training Division, Training Standards (Sept. 28, 2006).

<sup>110</sup>The Project Management Institute, The Standard for Program Management© (2006).

**Table 4: TSA Training Standards and Evaluation Branch Recommendations for Improving SPOT Training and TSA Actions on the Recommendations**

Training Standards and Evaluation Branch recommendations	TSA action on recommendations
Ensure training instructors adhere to a set of professional guidelines.	TSA sent 47 TSA Approved Instructors for the SPOT program to recertification training in March 2009.
Add local policies and procedure as an addendum to the (SPOT) Training.	No action. <sup>a</sup>
Include more role-playing and scenarios in the classroom training so all trainees can practice casual conversation skills.	TSA added more role-playing scenarios to their basic SPOT training.
Develop recurrent training that can be placed on the TSA Online Learning Center.	TSA developed and deployed recurrent training on the TSA Online Learning Center in September 2009.
Develop templates for writing reports.	TSA added an Incident Report Writing course to the TSA Online Learning Center. Additionally, TSA has developed templates for Incident Reports and After Action Reports. TSA has also developed Online Learning Center training for completing SPOT Referral Reports.
Provide more real world videos.	TSA revised the SPOT training videos in late 2008.
Provide recurrent training of behaviors through online videos.	The video scenarios for recurrent training will be available in the second quarter of fiscal year 2010.
Add parts of the Bomb Appraisal Officer task into the training.	No action. <sup>a</sup>
Provide recurrent training outside of TSA (more Immigration and Customs Enforcement, DEA, and CBP training).	No action. <sup>a</sup>
Have BDOs spend more time with an On-the-Job-Training mentor.	No action. <sup>a</sup>
Validate the training for course content and On-the-Job-Training.	In 2009, in coordination with DHS S&T, TSA began the scientific analysis of the BDO position to empirically derive and validate the knowledge, skills, and attributes that it requires. The analysis is projected to be completed in fiscal year 2010.
Clarify SPOT's "Walk-the-Line" policy and communicate it to all BDO personnel.	TSA issued revised SPOT Standard Operating Procedures to all BDOs in January 2009.

Source: TSA, Training Standards and Evaluation Branch, Office of Human Capital, Memorandum For Operational and Technical Training, and Behavior Detection and Document Validation Branch, Office of Security Operations on Training Transfer (L3) of SPOT Training, October 30, 2008.

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<sup>a</sup> According to TSA, the SPOT program office will determine if the recommended action is appropriate after the BDO job task analysis and training task analysis are completed.

Additionally, in conjunction with S&T, TSA conducted a training effectiveness evaluation on the Additional Behavior Detection Techniques course, which showed a statistically significant increase in knowledge and skills following completion of the course.

S&T is currently conducting a BDO job task analysis, which may be used to evaluate and update the SPOT training curriculum. Following the completion of the job task analysis—anticipated in mid-May 2010—TSA’s Operational and Technical Training Division intends to conduct an in-depth training gap analysis,<sup>111</sup> which will take approximately 2 months to complete. Following completion of the training gap analysis, the agency will develop project plans, including milestones for future development efforts, to address any training concerns. However, to date, the agency does not have an evaluation plan including time frames and milestones for completion. According to the Operational and Technical Training Division, TSA will conduct periodic evaluations as the BDO position evolves. By conducting a comprehensive evaluation of the effectiveness of its training program, TSA will be in a better position to determine if BDOs are being taught the knowledge and skills they need to perform their job. Furthermore, by developing milestones and time frames for conducting such evaluations systematically, as well as on a periodic basis, TSA could help ensure that the SPOT training program is evaluated in accordance with its directives to help ensure that the program continues to provide BDOs with the necessary tools required to carry out their responsibilities.

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## Conclusions

TSA developed the SPOT program in the wake of September 11, 2001, in an effort to respond quickly to potential threats to aviation security by identifying individuals who may pose a threat to aviation security, including terrorists planning or executing an attack who were not likely to be identified by TSA’s other screening security measures. Because TSA did not ensure that SPOT’s underlying methodology and work methods were scientifically validated prior to its nationwide deployment, an independent panel of experts could help determine whether a scientific foundation exists for the way in which the SPOT program uses behavior detection analysis for counterterrorism purposes in the aviation environment.

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<sup>111</sup>The training gap analysis identifies gaps in the training curriculum.

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With approximately \$5.2 billion devoted to screening passengers and their property in fiscal year 2009, it is important that TSA provides effective stewardship of taxpayer funds ensuring a return on investment for each layer of its security system. As one layer of aviation security, the SPOT program has an estimated projected cost of about \$1.2 billion over the next 5 years if the administration's requested funding of \$232 million for fiscal year 2011 remains at this level.<sup>112</sup> The nation's constrained fiscal environment makes it imperative that careful choices be made regarding which investments to pursue and which to discontinue. If an independent expert panel determines that DHS's study is sufficiently comprehensive to determine whether the SPOT program is based on valid scientific principles that can be effectively applied in an airport environment for counterterrorism purposes, then conducting a comprehensive risk assessment including threat, vulnerability, and consequence could strengthen TSA's ability in making resource allocation decisions and prioritizing its risk mitigation efforts. Moreover, conducting a cost-benefit analysis could help TSA determine whether SPOT provides benefits greater than or equal to other security alternatives and whether its level of investment in the SPOT program is appropriate. Revising its strategic plan for SPOT to incorporate risk assessment information, cost and resource analysis, and other essential components could enhance the plan's usefulness to TSA in making program management and resource allocation decisions to effectively manage the deployment of SPOT.

Providing guidance on how to use TSA's resources for running passenger names against intelligence and criminal databases available to the Transportation Security Operations Center and helping DHS to connect disparate pieces of information using the Transportation Information Sharing System and other related intelligence and crime database and data sources could better inform DHS and TSA regarding the identity and background of certain individuals and thereby enhance aviation security. In addition, implementing the steps called for in the TSA Office of Strategic Operations plan to provide BDOs with a real-time mechanism to verify passenger identities and backgrounds via TSA's Transportation Security Operations Center could strengthen their ability to rapidly verify the identity and background of passengers who have caused concern, and increase the likelihood of detecting and disrupting potential terrorists

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<sup>112</sup>This estimate assumes that there would be no further increases for SPOT over the next 5 years above the requested \$232 million level for fiscal year 2011. However, to stay even with inflation, the allocation would likely increase somewhat each year.

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intending to cause harm to the aviation system. Additionally, developing outcome-oriented performance measures, making improvements to the SPOT database, and studying the feasibility of utilizing video recordings of individuals as they transited checkpoints and who were later charged with or pleaded guilty to terrorism-related offenses, could help TSA evaluate the SPOT program, identify potential vulnerabilities, and assess the effectiveness of its BDOs. Further, developing a plan for systematic and periodic evaluation of the training provided to BDOs along with time frames and milestones for its completion could help ensure that the SPOT training program is evaluated in accordance with its directives to help ensure that the program continues to provide BDOs with the necessary tools required to carry out their responsibilities.

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## Recommendations for Executive Action

To help ensure that SPOT is based on valid scientific principles that can be effectively applied in an airport environment, we recommend that the Secretary of Homeland Security convene an independent panel of experts to review the methodology of the DHS S&T Directorate study on the SPOT program to determine whether the study's methodology is sufficiently comprehensive to validate the SPOT program. This assessment should include appropriate input from other federal agencies with expertise in behavior detection and relevant subject matter experts.

If this research determines that the SPOT program has a scientifically validated basis for using behavior detection for counterterrorism purposes in the airport environment, then we recommend that the TSA Administrator take the following four actions:

- Conduct a comprehensive risk assessment to include threat, vulnerability, and consequence of airports nationwide to determine the effective deployment of SPOT if TSA's ongoing Aviation Modal Risk Assessment lacks this information.
- Perform a cost-benefit analysis of the SPOT program, including a comparison of the SPOT program with other security screening programs, such as random screening, or already existing security measures.
- Revise and implement the SPOT strategic plan by incorporating risk assessment information, identifying cost and resources, linking it to other related TSA strategic documents, describing how SPOT is integrated and implemented with TSA's other layers of aviation security, and providing guidance on how to effectively link the roles, responsibilities, and capabilities of federal, state, and local officials providing program support.

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- Study the feasibility of using airport checkpoint-surveillance video recordings of individuals transiting checkpoints who were later charged with or pleaded guilty to terrorism-related offenses to enhance understanding of terrorist behaviors in the airport checkpoint environment.

Concurrent with the DHS S&T Directorate study of SPOT, and an independent panel assessment of the soundness of the methodology of the S&T study, we recommend that the TSA Administrator take the following six actions to ensure the program's effective implementation:

- To provide additional assurance that TSA utilizes available resources to support the goals of deterring, detecting, and preventing security threats to the aviation system, TSA should:
  - Provide guidance in the SPOT Standard Operating Procedures or other TSA directive to BDOs, or other TSA personnel, on inputting data into the Transportation Information Sharing System and set milestones and a time frame for deploying Transportation Information Sharing System access to SPOT airports so that TSA and intelligence community entities have information from all SPOT LEO referrals readily available to assist in "connecting the dots" and identifying potential terror plots.
  - Implement the steps called for in the TSA Office of Security Operations Business plan to develop a standardized process for allowing BDOs or other designated airport officials to send information to TSA's Transportation Security Operations Center about passengers whose behavior indicates that they may pose a threat to security, and provide guidance on how designated TSA officials are to receive information back from the Transportation Security Operations Center.
  - Direct the TSA Transportation Security Operations Center to utilize all of the law enforcement and intelligence databases available to it when running passenger names, for passengers who have risen to the level of a LEO referral.
- To better measure the effectiveness of the program and evaluate the performance of BDOs, TSA should:
  - Establish a plan that includes objectives, milestones, and time frames to develop outcome-oriented performance measures to help refine the current methods used by Behavior Detection Officers for identifying individuals who may pose a risk to the aviation system.
  - Establish controls to help ensure completeness, accuracy, authorization, and validity of data collected during SPOT screening.

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- To help ensure that TSA provides BDOs with the knowledge and skills needed to perform their duties, TSA should:
    - Establish time frames and milestones for its plan to systematically conduct evaluations of the SPOT training program on a periodic basis.

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## Agency Comments and Our Evaluation

We provided a draft of our report to DHS and TSA on March 19, 2010, for review and comment. On May 3, 2010, DHS provided written comments, which are reprinted in appendix II. In commenting on our report, DHS stated that it concurred with 10 of our recommendations and identified actions taken, planned, or under way to implement them. However, the actions DHS reported it plans to take and has underway do not fully address the intent of our first recommendation. DHS also concurred in principle with an eleventh recommendation stating that it had convened a working group to determine the feasibility of implementing it. DHS commented on the scientific basis underlying SPOT and on two statements in our report that it believed were inaccurate—specifically, DHS disagreed with our reliance on a 2008 National Research Council report published under the auspices of the National Academy of Sciences on issues related to behavior detection, and second, on issues related to unpublished research they had cited as a partial validation of some aspects of the SPOT program.<sup>113</sup> Finally, DHS commented on our conclusion regarding the use of the SPOT referral data.

Regarding our first recommendation that DHS convene an independent panel of experts to review the methodology of DHS's Science and Technology Directorate (S&T) study on SPOT, and to include appropriate input from other federal agencies with relevant expertise, DHS concurred and stated the current process includes an independent review of the program that will include input from other federal agencies and relevant experts. Although DHS has contracted with the American Institutes for Research to conduct its study, it remains unclear who will oversee this review and whether they are sufficiently independent from the current research process. DHS's response also does not describe how the review currently planned is designed to determine whether the study's methodology is sufficiently comprehensive to validate the SPOT program. As we noted in our report, research on other issues, such as determining

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<sup>113</sup> The National Research Council is a component of the National Academy of Sciences, a part of a private, nonprofit institution, the National Academies, which provide science, technology, and health policy advice under a congressional charter.

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the number of individuals needed to observe a given number of passengers moving at a given rate per day in an airport environment or the duration that such observation can be conducted by BDOs before observation fatigue affects effectiveness, could provide additional information on the extent to which SPOT can be effectively implemented in airports. Dr. Paul Ekman, a leading research scientist in the field of behavior detection, told us that additional research could help determine the need for periodic refresher training since no research has yet determined whether behavior detection is easily forgotten or can be potentially degraded with time or lack of use. Thus, questions exist as to whether behavior detection principles can be reliably and effectively used for counterterrorism purposes in airport settings to identify individuals who may pose a risk to the aviation system. To help ensure an objective assessment of the study's methodology and findings, DHS could benefit from convening an independent panel of experts from outside DHS to determine whether the study's methodology is sufficiently comprehensive to validate the SPOT program.

DHS also concurred with our second recommendation to conduct a comprehensive risk assessment to determine the effective deployment of SPOT. DHS stated that TSA's Aviation Modal Risk Assessment is designed to evaluate overall transportation security risk, not deployment strategies. However, DHS noted that TSA is in the process of conducting an initial risk analysis using its risk management analysis tool and plans to update this analysis in the future. However, it is not clear from DHS's comments how this analysis will incorporate an assessment of TSA's deployment strategy for SPOT.

DHS also concurred with our third recommendation to perform a cost-benefit analysis of SPOT. DHS noted that TSA is developing an initial cost-benefit analysis and that the flexibility of behavior detection officers already suggests that behavior detection is cost-effective. However, it is not clear from DHS's comments whether its cost-benefit analysis will include a comparison of the SPOT program with other security screening programs, such as random screening, or already existing security measures as we recommended. Completing its cost-benefit analysis and comparing it to other screening programs should help establish whether the SPOT program is cost-effective compared to other layers of security.

With regard to our fourth recommendation to revise and implement the SPOT strategic plan using risk assessment information, DHS concurred and noted that analysis facilitated by the risk management analysis tool

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will allow the program to revise the SPOT strategic plan to incorporate the elements identified in our recommendation.

DHS also concurred with our fifth recommendation to study the feasibility of using airport checkpoint-surveillance video recordings to enhance its understanding of terrorist behaviors. DHS noted that TSA agrees this could be a useful tool and is working with DHS's S&T Directorate to utilize video case studies of terrorists, if possible. These cases studies could help TSA determine what behaviors had been demonstrated by these persons convicted of terrorist-related offenses who went through SPOT airports, and what could be learned from the observed behaviors.

DHS concurred with our sixth recommendation that TSA provide guidance in the SPOT SOP or other directives to BDOs, or other TSA personnel, on how to input data into the Transportation Information Sharing System database. DHS stated that the SPOT SOP is undergoing revision, and that the revised version will provide guidance directing the input of BDO data into the Transportation Information Sharing System. DHS anticipates release of the updated SPOT SOP in fiscal year 2010. DHS also agreed that TSA should set milestones and a time frame for deploying Transportation Information Sharing System access to SPOT airports so that TSA and intelligence community entities have information from all SPOT LEO referrals readily available to assist in "connecting the dots" and identifying potential terror plots. DHS stated that TSA is currently drafting a plan to include milestones and a time frame for deploying System access to all SPOT airports.

DHS concurred with our seventh recommendation to develop a standardized process to allow BDOs or other designated airport officials to send information to TSA's Transportation Security Operations Center about passengers whose behavior indicates they may pose a threat to security, and to provide guidance on how designated TSA officials are to receive information back from the Center. DHS stated that TSA has convened a working group to address this recommendation. Moreover, TSA is developing a system and procedure for sending and receiving information from the Center and stated that it anticipates having a system in place later in fiscal year 2010.

DHS concurred in principle with regard to our eighth recommendation that the Transportation Security Operations Center utilize all of the databases available to it when conducting checks on passengers who rise to the level of a LEO referral against intelligence and criminal databases. DHS stated that TSA has convened a working group to address this

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recommendation. According to DHS, this group will conduct a study during fiscal year 2010 to determine the feasibility of fully implementing this recommendation. As such, the study is to review the various authorities, permissions, and limitations of each of the databases or systems cited in our report. DHS stated that access to some of the systems, requires more justification than a BDO referral. Further, according to DHS, because some of the databases or systems contain classified information, TSA will also need to adopt a communication strategy to transmit the passenger information between the BDO and Transportation Security Operations Center. DHS stated that TSA will work on a process to collect the passenger information, verify the passenger's identity, through checks of databases, and analyze that information to determine if the passenger is the subject of an investigation and may pose a risk to aviation security.

With regard to our ninth recommendation to establish a plan with objectives, milestones, and time frames to develop outcome-oriented performance measures for BDOs, DHS concurred and stated that TSA intends to consult with experts to develop outcome-oriented performance measures.

DHS also concurred with our tenth recommendation to establish controls for SPOT data. DHS noted that TSA established additional controls as part of the SPOT database migration to TSA's Performance Management Information System and is exploring an additional technology solution to reduce possible errors. As noted in our report, since these changes to the database were not complete at the time of our audit, we could not assess whether the problems we identified with the database had been corrected.

Regarding our eleventh recommendation to establish time frames and milestones to systematically evaluate the SPOT training program on a periodic basis, DHS concurred and stated that TSA intends to develop such a plan following completion of DHS's S&T Directorate's BDO Job Task Analysis, and TSA's training gap analysis, which identifies gaps in the training curriculum.

DHS also commented on the scientific basis underlying SPOT. Specifically, DHS stated that decades of scientific research has shown the SPOT behaviors to be "universal in their manifestation." However, according to DHS, its S&T Directorate is examining the extent to which behavior indicators are appropriate for screening purposes and lead to appropriate and correct security decisions. DHS also commented that the results of this work, which is currently underway, will establish a scientific

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basis of the extent to which the SPOT program instruments and methods are valid. Thus, DHS's comments suggest that additional research is needed to determine whether these behaviors can be used in an airport environment for screening passengers to identify threats to the aviation system.

Moreover, DHS took issue with our use of a report from the National Research Council of the National Academy of Sciences stating that we improperly relied upon this report.<sup>114</sup> We disagree. DHS questioned the findings of the National Research Council report and stated that it lacked sufficient information for its conclusions because it principally focused on privacy as it relates to data mining and behavioral surveillance and was not intended to represent an exhaustive or definitive review of the research or operational literature on behavioral screening, including recent unpublished DHS, defense, and intelligence community studies. DHS also stated that the National Research Council report did not study the SPOT program and that the researchers did not conduct interviews with SPOT personnel.

As we noted in our report, although the National Research Council report addresses broader issues related to privacy and data mining, a senior Council official—and one of the authors of the study—stated that the committee included behavior detection as a focus because any behavior detection program could have privacy implications. This official added that the primary objective of the report was to develop a framework for sound decision making for programs, such as SPOT, and help ensure a sound scientific and legal basis. According to this official, the National Academy of Sciences' Committee on Technical and Privacy Dimensions of Information for Terrorism Prevention and Other National Goals—which had oversight of the report—was briefed on the SPOT program as part of

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<sup>114</sup>National Research Council, *Protecting Individual Privacy in the Struggle Against Terrorists: A Framework for Assessment* (Washington, D.C.: National Academies Press, 2008). The report's preparation was overseen by the National Academy of Science's 21-member Committee on Technical and Privacy Dimensions of Information for Terrorism Prevention and Other National Goals. We reviewed the approach used and the information provided in this study and found the study to be credible for our purposes. The contributors included recognized experts across a variety of fields, including William J. Perry, former Secretary of Defense, and Dr. Tara O'Toole, then-CEO and Director of the Center for Biosecurity of the University of Pittsburgh Medical Center, Professor of Medicine and of Public Health at the University of Pittsburgh. (Dr. O'Toole was subsequently nominated and confirmed as the Under Secretary of the DHS Science and Technology Directorate.)

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the study. The Committee also conducted meetings with three experts in behavior detection as part of their research. During the course of our review, we interviewed three Committee members responsible for developing the report's findings, as well as four other behavior detection experts, including the three who participated in the National Research Council study. Our discussions with these experts corroborated the report's findings. Thus, we believe that our use of the Council report was an appropriate and a necessary part of our review.

However, the National Research Council report was only one of many sources that we analyzed with regard to the science of behavioral and physiological screening, and its applicability to an airport environment. As we noted in the description of our methodology, our study included interviews with officials from DHS as well as several of its components and other U.S. government agencies—each of which use elements of behavior detection in their daily work. We also interviewed El Al airline officials, a former director of security at Israel's Ben-Gurion airport, and seven nationally recognized experts in behavior detection as part of our review. Moreover, as we explained in the discussion of our scope and methodology, we conducted a survey about the SPOT program of all 118 Federal Security Directors for all SPOT airports, and conducted site visits to 15 SPOT airports. In addition, we analyzed the SPOT referral database, to the extent the data permitted, covering a 4-year period and the results from 2 billion passengers passing through SPOT airports. Moreover, we attended both the basic and advanced training courses in behavior detection provided by TSA to BDOs, in order to better understand how the program is carried out. Therefore, our analysis of the program was not derived from or based on a single study by the National Research Council as DHS suggested, but rather is based on all of the information we gathered and synthesized from multiple, diverse, expert sources, each of which provided different perspectives about the program, as well as about behavior detection in general.

DHS also disagreed with the accuracy of a statement included in our report that noted DHS S&T could not provide us with specific contacts related to sources of information for certain research it cited as support for the SPOT program. In its comments, DHS stated that it had provided us with all requested documents that represent DHS's S&T Directorate-sponsored research. We agree. However, DHS did not provide us with contact information for the sources of unpublished studies by the Department of Defense and other intelligence community studies that DHS S&T had cited as support for the SPOT program. Without such

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information, we are unable to verify the contents of these unpublished studies.

Finally, DHS stated that while we were unable to use the SPOT referral data to assess whether any behavior or combination of SPOT behaviors could be used to reliably predict the final outcome of an incident involving the use of SPOT, it was able to analyze the SPOT referral database successfully after working with TSA to verify scores assigned to different indicators. Our concern with the data did not involve the question of whether some behaviors were entered erroneously, nor whether errors in coding were excessive or non-random. Rather, we were concerned with whether the data on behaviors were complete. Specifically, it cannot be determined from the SPOT referral database whether all behaviors observed were included for each referred passenger by each BDO or whether only the behaviors that were sufficient for a LEO referral were recorded into the database. It is not possible to determine from the database if the number of observed behaviors entered for a given passenger was the total number of observed behaviors, or whether additional behaviors were observed. A rigorous analysis of the relative effects of the different behaviors on the outcomes of the use of SPOT would require each BDO to record, for each of the observable behaviors, whether it was or was not observed.

TSA also provided technical comments that we incorporated as appropriate.

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We will send copies of this report to the Secretary of Homeland Security; the TSA Administrator (Acting); and interested congressional committees as appropriate. The report will also be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-4379 or [lords@gao.gov](mailto:lords@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page

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of this report. Key contributors to this report are acknowledged in appendix III.

Sincerely yours,

A handwritten signature in black ink that reads "Stephen Lord". The signature is written in a cursive style with a large, stylized "S" and "L".

Stephen M. Lord  
Director, Homeland Security and Justice Issues

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# Appendix I: Scope and Methodology

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To determine the extent to which the Transportation Security Administration (TSA) determined whether the Screening of Passengers By Observation Techniques (SPOT) program had a scientifically-validated basis for identifying passengers before deploying it, we reviewed literature on behavior analysis by subject matter experts, interviewed seven experts in behavior analysis, interviewed other federal agencies and entities about how they use behavior detection techniques, and analyzed relevant reports and books on the topic. These included a 2008 study by the National Research Council of the National Academy of Sciences that has a discussion regarding deception and behavioral surveillance, as well as other issues related to behavioral analysis.<sup>1</sup> We interviewed Dr. Herbert S. Lin, who was a primary author of the report, as well as Dr. Robert W. Levenson, and Dr. Stephen E. Fienberg, both members of the Academy committee that oversaw the report, about the report's findings with regard to behavior detection, and the extent to which behavior detection in a complex environment, such as an airport terminal, has been validated with regard to its effectiveness in identifying persons who may be a risk to aviation security. Other behavior detection experts we consulted were Dr. Paul Ekman;<sup>2</sup> Dr. Mark Frank;<sup>3</sup> Dr. David Givens;<sup>4</sup> Dr. David Matsumoto;<sup>5</sup>

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<sup>1</sup>National Research Council, *Protecting Individual Privacy in the Struggle Against Terrorists: A Framework for Assessment* (Washington, D.C.: National Academies Press, 2008). The report's preparation was overseen by the NAS's 21-member Committee on Technical and Privacy Dimensions of Information for Terrorism Prevention and Other National Goals. We reviewed the approach used and the information provided in this study and found the study to be credible for our purposes. The contributors included recognized experts across a variety of fields, including William J. Perry, former Secretary of Defense, and Dr. Tara O'Toole, then-CEO and Director of the Center for Biosecurity of the University of Pittsburgh Medical Center, Professor of Medicine and of Public Health at the University of Pittsburgh. (Dr. O'Toole was subsequently nominated and confirmed as the Under Secretary of DHS's Science and Technology Directorate. The National Research Council is a component of the National Academy of Sciences, a part of a private, nonprofit institution, the National Academies, which provide science, technology, and health policy advice under a congressional charter

<sup>2</sup>Dr. Ekman is professor emeritus of psychology at the University of California Medical School, San Francisco, and is considered one of the world's foremost experts on facial expressions. His books include: *Emotions Revealed: Recognizing Faces and Feelings to Improve Communications and Emotional Life* (New York: Holt and Company, 2003); *Emotion in the Human Face* (New York: Pergamon Press, 1972); *Unmasking the Face: A guide to Recognizing Emotions from Facial Clues* (Englewood Cliffs, N.J.: Prentice-Hall, 1975). Dr. Ekman has published more than 100 articles.

<sup>3</sup>Dr. Frank is Associate Professor, Department of Communication, College of Arts and Sciences, at the University at Buffalo, State University of New York. He is on the Advisory Board of the University's Center for Unified Biometrics and Sensors, and has conducted research supported by DHS, the Defense Advanced Research Projects Agency, and the National Science Foundation.

and Mr. Rafi Ron, former director of security at Israel's Ben-Gurion Airport. Dr. Ekman, Dr. Frank, and Mr. Ron provided expert advice for the National Research Council study. Dr. Givens was identified by TSA as having been their principal source for the nonverbal behavior indicators used by the SPOT program. We also interviewed Dr. Lawrence M. Wein, an expert in emergency responses to terror attacks and mathematical models in operations management.<sup>6</sup> In addition, we interviewed officials from the Department of Homeland Security's (DHS) Science and Technology (S&T) Directorate regarding their ongoing research into behavior detection. Although the views of these experts cannot be generalized across all experts in behavior analysis because we selected individuals based on their publications on behavioral analysis or related topics, their recognized accomplishments and expertise, and, in some cases, TSA's use of their work or expertise to design and review the SPOT program's behaviors, they provided us with an overall understanding of the fundamentals of behavior analysis, and how it could be applied.

To determine the basis for TSA's strategy to develop and deploy SPOT and evaluate to what extent SPOT was informed by a cost-benefit analysis and a strategic plan, we reviewed program documentation, including briefings prepared by the SPOT program office during the course of developing and fielding SPOT, two versions of a strategic plan for SPOT, and the 2009 SPOT standard operating procedures guidance. We compared the plans and analyses used by TSA to develop and implement SPOT to criteria on how to develop and implement programs in DHS's 2006 *Cost Benefit Analysis Guidebook*,<sup>7</sup> as well as to Office of Management and Budget guidance on the utility of cost-benefit analyses in program

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<sup>4</sup>Dr. Givens is the director of the nonprofit Center for Nonverbal Studies, in Spokane, Washington. He is the author of *Love Signals: A Practical Field Guide to the Body Language of Courtship* (St. Martin's, New York, 2005) and *Crime Signals: How to Spot a Criminal Before You Become a Victim* (St. Martin's, 2008). The Center's Web site links to Dr. Givens' reference tool, *The Nonverbal Dictionary of Gestures, Signs and Body Language Cues*.

<sup>5</sup>Dr. Matsumoto is a Professor, Department of Psychology at San Francisco State University, and is an associate of Dr. Ekman.

<sup>6</sup>Dr. Wein is the Paul E. Holden Professor of Management Science at the Graduate School of Business, Stanford University. His homeland security-related work includes four papers in *Proceedings of the National Academy of Sciences*, on an emergency response to a smallpox attack, an emergency response to an anthrax attack, a biometric analysis of the US-VISIT Program, and an analysis of a bioterror attack on the milk supply.

<sup>7</sup>DHS, *Cost Benefit Analysis Guidebook* (Washington, D.C.: February 2006).

implementation.<sup>8</sup> We also analyzed the development of SPOT in light of the standards and criteria cited in DHS's 2006 National Infrastructure Protection Plan. We met with relevant TSA officials to discuss these issues. To assess whether DHS developed an effective strategic plan for SPOT prior to implementing the program, we interviewed TSA officials involved in development of the SPOT strategic plan. We analyzed whether the SPOT plan incorporated the desirable characteristics of an effective strategic plan as identified by previous GAO work on what strategic plans should include to be considered effective, such as a risk assessment, cost and resources analysis, and a means for collaboration with other key entities.<sup>9</sup> We also examined it in light of the requirements of the Government Performance and Results Act of 1993, which specifies the elements of strategic plans for government programs.<sup>10</sup> We assessed whether the SPOT strategic plan was followed by TSA. As part of our analysis of the planning for SPOT before it was implemented on a nationwide basis, we reviewed TSA documentation related to the development and pilot testing of SPOT, such as a TSA white paper on SPOT, and interviewed key program officials from both headquarters and field offices.<sup>11</sup>

We also interviewed cognizant officials from other U.S. government agencies and agency entities that utilize behavior detection in their work, including U.S. Customs and Border Protection (CBP), the U.S. Secret Service, the TSA's Federal Air Marshal Service (FAMS) component, and the Federal Bureau of Investigation (FBI). We sought their views on the utility of various behavior detection methods, their experience with practicing behavior detection, and asked them about the extent to which TSA had consulted with them in developing and implementing the SPOT program.

To better understand how SPOT incorporated expertise about the use of behavior detection in an airport setting, we interviewed officials from

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<sup>8</sup>Office of Management and Budget (OMB), Circular No. A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (Washington, D.C.: October 1992); and Circular A-4, *Regulatory Analysis* (Washington, D.C.: September 2003).

<sup>9</sup>[GAO-04-408T](#).

<sup>10</sup>Pub. L. No. 103-62, 107 Stat. 285 (1993).

<sup>11</sup>TSA, *Screening of Passengers by Observation Technique (SPOT) White Paper for the Department of Homeland Security* (Washington, D.C.: Feb. 22, 2005).

Israel's El Al Airlines, which is cited by TSA as having provided part of the basis of the SPOT program. We asked about El Al's methods to ensure the security of its passenger aircraft, and also interviewed a former head of security at Israel's Ben-Gurion airport, who has advised TSA on security issues. We asked TSA and SPOT program officials about their consultations with El Al, and about the ways in which they had utilized El Al's expertise, as well as about any other entities whose expertise they may have adopted into SPOT.

To determine the challenges, if any, that emerged during implementation of the SPOT program, we interviewed headquarters and field personnel about how the program has utilized the resources available to it to ensure that it is effective. These resources included the support of law enforcement officers (LEOs), to whom passengers are referred by Behavior Detection Officers (BDOs) for additional questioning. In addition, we interviewed SPOT program and TSA officials about the databases available to them at TSA's Transportation Security Operations Center to determine if a suspect passenger is being sought by other U.S. law enforcement or intelligence entities, and whether there is guidance for BDOs on when and how to contact the Transportation Security Operations Center. We also asked about whether there is guidance and training for BDOs on how to access TSA's Transportation Information Sharing System database, which is owned by FAMS, and is available through the Transportation Security Operations Center.<sup>12</sup> To determine if any management challenges had emerged related to management controls in developing and implementing SPOT, we compared TSA's approach for implementing and managing the SPOT program with GAO's *Standards for Internal Control in the Federal Government*<sup>13</sup> and with risk management principles we had previously identified.<sup>14</sup> Our legal counsel office reviewed court decisions relevant to the SPOT program. In addition, we interviewed attorneys from the American Civil Liberties Union, and obtained and reviewed TSA's Privacy Impact Assessments for SPOT, the Transportation Security Operations Center, and the Transportation

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<sup>12</sup>The data from interviews of suspicious passengers by FAMS are inputted into the Transportation Information Sharing System, as are reports sent to FAMS from airline employees about suspicious passengers.

<sup>13</sup>[GAO/AIMD-00-21.3.1](#).

<sup>14</sup>GAO, *Transportation Security: Comprehensive Risk Assessments and Stronger Internal Controls Needed to Help Inform TSA Resource Allocation*, [GAO-09-492](#) (Washington, D.C.: Mar. 27, 2009).

Information Sharing System. We also met with and discussed relevant privacy and legal issues with TSA's Offices of Privacy and Civil Rights/Civil Liberties. To obtain data about certain aspects of the SPOT program that the SPOT program office did not have, we conducted a survey of Federal Security Directors<sup>15</sup> whose responsibilities included security at all 161 SPOT airports at the time of our survey. (Some Federal Security Directors have responsibility for more than one airport.) We obtained a 100 percent response rate. This survey asked, among other things, about whether there were cameras at security checkpoints that record the interactions of Transportation Security Officers (TSO), BDOs, and passengers; if the airport authority had an agreement with TSA that specifies certain law enforcement actions during a SPOT referral; and if there was an agreement, or any other comparable guidance that specified a time limit for LEOs to come to checkpoints after being called for help by BDOs.

To determine the extent to which TSA has measured SPOT's effect on aviation security, we obtained and analyzed the TSA SPOT referral database, which records all incidents in which BDOs refer passengers to secondary, more intensive questioning, and which also records all incidents in which BDOs chose to refer passengers to LEOs. We found that the SPOT database was sufficiently reliable to count the number of arrests resulting from referrals from BDOs to LEOs, for examining the reasons for each arrest, and for counting the percentage of times that LEOs responded to BDO calls for service, and the length of time required. Use of these data required us to resolve apparent contradictions and anomalies in the database to make the data useable. Because of data problems, we were unable to conduct analyses to assess whether any behavior or combination of behaviors could be used to predict the final outcome of an incident involving the use of SPOT. In addition, we reviewed relevant standardization team reports and observed a standardization team visit in operation.

In addition, we spoke with BDO managers, Federal Security Directors, and Assistant Federal Security Directors to determine how BDOs are evaluated. To do so, we conducted site visits to 15 commercial airports at which BDOs and SPOT have been deployed, or almost 10 percent of the

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<sup>15</sup>Federal Security Directors are the highest ranking TSA security officials at U.S. airports; Assistant Federal Security Directors are their assistants. Both are responsible for all aspects of security at airports, including coordination with federal and nonfederal law enforcement entities operating at airports, such as FAMS, the Drug Enforcement Administration, and CBP.

161 airports with SPOT. We chose these airports taking into account the following criteria, among others: (1) each airport had BDOs deployed, and at each, the SPOT program had been in effect for no less than 3 months; (2) airports were chosen to provide a variety of sizes, as measured in annual passenger volume; physical location within the country (northeast, southwest, central, Pacific Coast, rural, urban); and estimated risk of terrorist incident, using DHS's Current Airports Threat Assessment<sup>16</sup> list (visiting 6 that were in the top 10, and others much lower); (3) BDOs who are employed by contractors, rather than employed directly by TSA; and (4) airports with LEOs who were identified to us by TSA as having received some form of behavior detection training and airports where they were not known to have received such training. In addition, we took into account the location of the airports with regard their proximity to subject matter experts on behavior detection whom we wished to interview, as well as the time and cost required to reach certain airports.

At each of the airports we visited, we interviewed cognizant officials, including the Federal Security Director or Assistant assigned to the airport, the BDO program manager, one or two BDOs, and one or two LEOs who have interacted with BDOs. Since each of these airports differs in terms of passenger volume, physical size and layout, geographic location, and potential value as a target for terrorism, among other things, the results from these visits are not generalizable to other airports. However, these visits provided helpful insight into the operation of SPOT at airports.

In addition, to determine if individuals had transited SPOT airports who were later charged with or pleaded guilty to terrorism-related offenses, we reviewed information contained in (1) the Treasury Enforcement Communication System II database maintained by CBP;<sup>17</sup> (2) Department of Justice information and court documents, including indictments and related documents; and (3) media accounts of individuals accused of

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<sup>16</sup>The Current Airports Threat Assessment is a threat estimate designed to provide a snapshot of the current terrorist threat to airports in the United States as well as for major international airports serving as last points of departure for U.S. airlines.

<sup>17</sup>The Treasury Enforcement Communication System was designed to provide controlled access to a large database of information about suspects and to interface with a number of other law enforcement systems. These capabilities are provided to users through various applications, including the Inspection/Interagency Border Inspection System applications that facilitate passenger processing through the implementation of innovative border control technology.

terrorism-related activities. We compared information pertaining to these individuals' dates of transit to the dates when SPOT was deployed to the various airports identified in the Treasury Enforcement Communication System and Justice Department data to determine if SPOT had been deployed at a given airport when the transits occurred. Further, we used our survey of Federal Security Directors at SPOT airports to determine the extent to which video surveillance cameras are present at checkpoints.

To assess the extent that SPOT training incorporates the attributes of an effective training program, we had training experts at TSA headquarters complete a training assessment tool that we developed using our prior work for assessing training courses and curricula.<sup>18</sup> To address training-related issues, including to understand better how other entities train their employees in behavior detection, and what their curricula include, we conducted site visits to the Secret Service, FAMS, CBP, and the FBI, and also interviewed nongovernmental experts on behavior detection (our selection of these experts is discussed above). As part of our assessment of SPOT training, we attended the basic SPOT training course given to BDOs, as well as the advanced SPOT course on behavior detection. We interviewed BDOs and BDO managers about the SPOT training, as well as officials of El Al airlines, with regard to how El Al trains and tests its personnel who utilize behavior recognition and analysis as part of their assessment of El Al passengers.

We conducted this performance audit from May 2008 through May 2010, 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.

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<sup>18</sup>GAO, *Human Capital: A Guide for Assessing Strategic Training and Development Efforts in the Federal Government*, [GAO-04-546G](#) (Washington, D.C.: Mar. 1, 2004).

# Appendix II: DHS Comments

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



**Homeland  
Security**

May 3, 2010

Mr. Steve Lord  
Director, Homeland Security & Justice Issues  
U.S. Government Accountability Office (GAO)  
441 G Street, NW  
Washington, DC 20548

Dear Mr. Lord:

Thank you for the opportunity to review and comment on GAO-10-157SU, the draft report titled: *Aviation Security: Efforts to Validate Aspects of TSA's Screening of Passengers by Observation Techniques (SPOT) Program Underway, But Opportunities Exist to Strengthen Validation and Address Operational Changes*. The Transportation Security Administration (TSA) appreciates the U.S. Government Accountability Office's work in planning and conducting its review and issuing this report.

TSA deployed the SPOT program in an effort to mitigate the threat of individuals with potentially hostile intent from boarding a commercial airplane and causing harm. Congress has encouraged the use of behavior recognition to enhance aviation security and has provided resources to support its implementation and expansion. The SPOT program fulfills the mandate of Section 1611 of the Implementing Recommendations of the 9/11 Commission Act, P.L. 110-53, that "TSA shall provide advanced training to the transportation security officers for the development of specialized security skills, including behavior observation and analysis ... in order to enhance the effectiveness of layered transportation security measures."

Intelligence continues to show there is no specific terrorist profile. In a March 10, 2010, hearing before the Senate Homeland Security and Governmental Affairs Committee, TSA Acting Administrator Gale Rossides highlighted the challenge faced by TSA leaders in "balancing the requirement to screen all passengers and to actually focus our officers' attention on the right passengers." TSA designed SPOT to increase its ability to focus on the "right passengers" by identifying persons exhibiting behaviors and appearances that may indicate stress, fear, and deception, and distinguish them from other travelers.

#### **SPOT is Based on Scientific Research and Law Enforcement Practices**

TSA's development and deployment of SPOT was a planned and deliberate process based on more than 3 years of operational test-bed assessment of SPOT at Boston's Logan International Airport from June 2003 until nationwide rollout began in fiscal year (FY) 2007. TSA carefully developed SPOT by using selective behaviors recognized within both the scientific and law

[www.dhs.gov](http://www.dhs.gov)

enforcement communities as displaying stress, fear, and deception. A SPOT working group, made up of various TSA and U.S. Department of Homeland Security (DHS) components,<sup>1</sup> was created in February 2004. Other organizations, such as the Massachusetts State Police, the Federal Bureau of Investigation (FBI) Behavioral Sciences Unit, and the Federal Law Enforcement Training Center, were also involved in SPOT development. Through these working groups, TSA has developed and finalized SPOT standard operating procedures (SOPs) for a common ability to assess behaviors indicating hostile intent for both aviation and mass transit modes of transportation. TSA continues to consult with its SPOT working group partners as it updates the procedures and science behind the program.

Decades of scientific research have shown the behaviors to be universal in their manifestation. In fact, the DHS Science and Technology Directorate (S&T) completed a study on suicide bomber indicators in July 2009 that illustrates a very high degree of overlap between operationally reported suicide bomber indicators and TSA SPOT behaviors. This result further bolsters TSA's contention that the SPOT program draws from the best practices of many defense, intelligence, and law enforcement organizations.

#### **SPOT Scientific Validation is Ongoing**

S&T began research in 2007 to examine the validity of the SPOT program. The series of studies involved in this research is designed to assess the validity of the SPOT scoring system, including the use of individual behavioral indicators to identify high-risk travelers. More specifically, S&T's research plan aims to examine the extent to which these behavioral indicators are appropriate for screening purposes and lead to appropriate and correct security decisions. When this study is complete, SPOT will be one of the most, if not the most, rigorously tested behavior-based security screening programs in existence.

Results of this work will establish a scientific basis of the **extent** to which the SPOT program, including its instrument and methods, such as the SPOT Referral Report and SOPs, are valid. Although it is challenging to establish the validity of a deterrent program in which the outcomes of interest are extremely rare, critical elements of reliability and validity will be rigorously assessed. Of particular importance is the evaluation of criterion-related validity, or the extent to which travelers are correctly selected for screening based on the SPOT scoring system. Establishing this degree of classification accuracy justifies the use of the SPOT program to discriminate high-risk travelers from low-risk travelers. Regardless of any other metrics, the extent to which the SPOT scores accurately identify high-risk travelers is critically important to program validity.

Following criterion-related validity, the next central element of validity is the consistency of implementation of the instrument and program. This will be examined in a variety of ways, including an investigation of the consistency in the operational use of SPOT behavioral indicators Behavior Detection Officers (BDOs) and across locations and time periods, all of which represents reliability assessment. Finally, construct-related validity, or the extent to which

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<sup>1</sup> Includes TSA's Office of Civil Rights, Office of Chief Counsel, and Privacy Office, and DHS's Policy Office and Transportation Security Laboratory.

the SPOT program behaviors truly represent the expressions of high-risk travelers, will be examined by comparing the SPOT behaviors to similar instruments in use for the same purpose. S&T's July 2009 study of suicide bomber indicators was the first step in evaluating construct-related validity.

This research is expected to be completed in FY 2011. TSA understands that after this validation is complete, there will be other areas where further research should be conducted, and it is TSA's intention to complete this research.

**National Academy of Sciences (NAS) Report Does Not Represent an Exhaustive or Definitive Review of the Research or Operational Literature on Behavioral Screening**

TSA would like to specifically address a few comments in the GAO-10-157SU report that we believe are inaccurate. The report draws heavily from a National Academy of Sciences (NAS) report which is being improperly relied upon. As the sponsor of the NAS study, DHS S&T questioned its findings, stating that the study lacked sufficient information for its conclusions because the NAS study principally focused on privacy as it relates to behavioral surveillance—not on behavioral surveillance technology itself. The study was not intended to, and the results do not represent an exhaustive or definitive review of the research or operational literature on behavioral and physiological screening, including recent findings from unpublished DHS, defense, and intelligence community studies. Furthermore, it should be noted that the report did not study the SPOT program, nor did any of the researchers conduct interviews with SPOT program personnel.

Additionally, GAO states that "DHS S&T could not provide us with specific contacts related to the sources of this research." This statement is not accurate. The record should reflect that DHS S&T provided all requested documents that represented S&T-sponsored research and for which S&T possessed the requisite release authority. DHS was not able to release specific documents related to research for which it was not the originator.

The report further states that the audit team was unable to use the SPOT referral data to assess whether any behavior or combination of SPOT behaviors could be used to reliably predict the final outcome of an incident involving the use of SPOT. However, DHS S&T was able to successfully conduct some preliminary analysis of the SPOT referral database. Prior to analysis of the SPOT reports, S&T worked with TSA to verify the scores assigned to each indicator with the SPOT score sheets and to rescore the pertinent sections and total accordingly for nearly 100,000 operational reports from 2008. While random errors were noted, errors in large databases that require manual entry are not uncommon. Convention suggests that large databases like this typically include an error rate of 3 to 5 percent. As long as such errors are random, the analytical method is robust enough to account for random errors in this range.

In conclusion, TSA strongly believes that behavior detection is a vital layer in its aviation security strategy, and will continue to strengthen as the program matures. Leaders within the community of behavior detection researchers agree. TSA appreciates GAO's work to identify opportunities to enhance the SPOT program, and we will continue to work diligently to address

the issues identified by GAO. Our ongoing progress demonstrates our commitment to TSA's mission of securing our Nation's transportation systems.

We also appreciate the opportunity to provide you with, in collaboration with DHS S&T, comments to GAO's audit recommendations.

**Recommendation 1:** To help ensure that SPOT is based on valid scientific principles that can be effectively applied in an airport environment, we (GAO) recommend that the Secretary of Homeland Security convene an independent panel of experts to review the methodology of the S&T Directorate study on the SPOT program before the study is implemented to determine whether the study's methodology is sufficiently comprehensive to validate the SPOT program. This assessment should include appropriate input from other federal agencies with expertise in behavior detection and relevant subject matter experts.

**Concur.** The U.S. Department of Homeland Security (DHS) Science & Technology Directorate's (S&T) current validation process includes an independent and comprehensive review of the ongoing SPOT study to be conducted in support of and in collaboration with the TSA SPOT program. The assessment will include input from other Federal agencies with expertise in behavior detection and relevant subject matter experts. S&T will work with TSA to present the SPOT validation project to the panel, produce a report summarizing the panel's recommendations, and implement pertinent suggestions in FY 2010.

**GAO further recommends that if this research determines that the SPOT program has a scientifically validated basis for using behavior detection for counterterrorism purposes in the airport environment, then the TSA Administrator take the following actions:**

**Recommendation 2:** Conduct a comprehensive risk assessment to include threat, vulnerability, and consequence of airports nationwide to determine the effective deployment of SPOT if TSA's ongoing Aviation Modal Risk Assessment lacks this information.

**Concur.** TSA's Aviation Modal Risk Assessment (AMRA) is designed to evaluate the transportation security risk landscape and compare it to other modes. However the AMRA does not evaluate risk effectiveness of countermeasures or optimal deployment strategies. For the Aviation mode, TSA uses the Risk Management Analysis Tool (RMAT), a risk simulation model based on laboratory and operational data that evaluates risk using threat inputs, vulnerability information, and consequence estimates. TSA is in the process of conducting an initial risk analysis on the SPOT program using RMAT. The risk analysis is based on the initial SPOT validation results and will be updated as the validation study results are finalized.

**Recommendation 3:** Perform a cost-benefit analysis of the SPOT program including a comparison of the SPOT program with other security screening programs, such as random screening, or already existing security measures.

**Concur.** The SPOT program will use RMAT to perform a cost-benefit analysis of Behavior Detection Officers (BDOs) as a countermeasure. The first step in the process is the initial risk

assessment that is being conducted on the SPOT program using RMAT. For the cost-benefit analysis, costs will be defined as the 5-year total cost of the countermeasure across the aviation system. Benefit will be defined as risk-reduction across the aviation security system against a portfolio of scenarios. TSA is currently developing an initial cost-benefit analysis for a variety of passenger-screening countermeasures including BDOs using the RMAT tool as a basis for analysis. BDOs' flexibility across a variety of risk scenarios suggests that behavior detection is a cost-effective countermeasure.

**Recommendation 4.** Revise and implement the SPOT strategic plan by incorporating risk assessment information, identifying cost and resources, linking it to other related TSA strategic documents, describing how SPOT is integrated and implemented with TSA's other layers of aviation security, and providing guidance on how to effectively link the roles, responsibilities and capabilities of federal, state, and local officials providing program support.

**Concur.** The RMAT risk analysis of the BDO program is assisting the SPOT program in identifying other countermeasure capabilities that are linked to the behavior detection capability. This analysis will allow the SPOT program to develop a revision to the SPOT strategic plan that will incorporate the elements identified in the recommendation.

**Recommendation 5:** Study the feasibility of using airport checkpoint-surveillance video recordings of individuals transiting checkpoints, and who were later charged with or pleaded guilty to terrorism-related offenses, to enhance its understanding of terrorist behaviors in the airport checkpoint environment.

**Concur.** TSA will study the feasibility of using checkpoint surveillance video recordings of individuals transiting checkpoints, and who were later charged with or pleaded guilty to terrorism-related offenses. TSA agrees that this could be a useful tool in understanding terrorist behaviors in the checkpoint environment.

Additionally, TSA is currently working with DHS S&T/Human Factors to conduct operational video validation of the SPOT program. TSA will use a variety of video case studies to validate the SPOT program including, if possible, reviewing video of terrorists transiting the TSA checkpoint. It is exceedingly rare, however, for video cameras to capture terrorists transiting TSA checkpoints. Unfortunately, this factor significantly reduces the feasibility of conducting these case studies.

**GAO also recommends that concurrent with the DHS S&T Directorate study of SPOT, and an independent panel assessment of the soundness of the methodology of the S&T study, the TSA Administrator take the following actions:**

**Recommendation 6:** Provide guidance in the SPOT SOP or other TSA directive to BDOs, or other TSA personnel, on inputting data into the Transportation Information Sharing System (TISS) and set milestones and a timeframe for deploying Transportation Information Sharing System access to SPOT airports so that TSA and intelligence community entities have information from all SPOT Law Enforcement officer (LEO)

referrals readily available to assist in “connecting the dots” and identifying potential terror plots.

**Concur.** TSA is currently undergoing a revision of the SPOT Standard Operating Procedure (SOP). The SOP will provide guidance directing the input of BDO data into TISS. TSA anticipates release of the updated SPOT SOP in FY 2010. Additionally, TSA is currently drafting a formal plan to include milestones and a timeframe for deploying TISS access to all SPOT airports.

**Recommendation 7:** Implement the steps called for in the TSA Office of Security Operations Business plan to develop a standardized process for allowing BDOs or other designated airport officials to send information to TSA’s Transportation Security Operations Center (TSOC) about passengers whose behavior indicates that they may pose a threat to security, and provide guidance on how designated TSA officials are to receive information back from the Transportation Security Operations Center.

**Concur.** TSA has convened a working group made up of members of the Office of Security Operations, Office of Chief Counsel, Office of Intelligence, and the Office of Law Enforcement/Federal Air Marshal Service (FAMS) to address this recommendation. TSA is developing a system and procedure for sending and receiving information from the TSOC and anticipates having a system in place in FY 2010. It should be noted that information from BDO referrals has been transmitted to the TSOC previously; however, TSA agrees to institute a standardized process.

**Recommendation 8:** Utilize all of the databases available to the Transportation Security Operations Center when running passengers who rise to the level of a LEO referral against intelligence and criminal databases.

**Concur in principle.** TSA has convened a working group composed of members of the Office of Security Operations, Office of Chief Counsel, Office of Intelligence, and the Office of Law Enforcement/FAMS to address this recommendation. This group will conduct a feasibility study during FY 2010 to examine if this recommendation can be fully implemented. This study will look at the various authorities, permissions, and limitations of each of the databases or systems cited in this audit. Access to some of the systems, such as Criminal History Record Check (CHRC), requires more justification than a BDO referral. Because some of the databases or systems contain classified information, TSA will also need to adopt a communication strategy to transmit the passenger information back and forth between the BDO and TSOC. TSA will work on a process to collect the passenger information, verify the passenger’s identity, through checks of databases, and analyze that information to determine if the passenger is the subject of an investigation and may pose a risk to aviation.

**Recommendation 9:** Establish a plan that includes objectives, milestones, and timeframes to develop outcome-oriented performance measures to help refine the current methods used by Behavior Detection Officers for identifying individuals who may pose a risk to the aviation system.

**Concur.** TSA understands the value of outcome-oriented performance measures. However, as noted by GAO, there is difficulty in establishing these measures for a deterrence-based program. Nonetheless, TSA will consult with industry experts to develop outcome-oriented performance measures. TSA will establish a plan that includes objectives, milestones, and timeframes, with an end result of producing outcome-oriented performance measures to help refine the current methods used by BDOs for identifying individuals who may pose a risk to the aviation system.

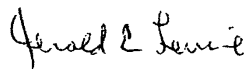
**Recommendation 10:** Establish controls to help ensure completeness, accuracy, authorization, and validity of data collected during SPOT screening.

**Concur.** In March 2010, TSA migrated the SPOT database to TSA's Performance Management Information System. This migration greatly enhances the SPOT program's capabilities, as they relate to completeness, accuracy, authorization, and validity of data collected during SPOT screening. Additional controls have been put in place to address the shortcomings of the previous database which were highlighted by GAO. TSA is also examining a technology solution to allow one-time transcription of all SPOT referral data. This will reduce the possibility of errors due to incorrect transcription from one medium to another.

**Recommendation 11:** Establish timeframes and milestones for its plan to systematically conduct evaluations of the SPOT training program on a periodic basis.

**Concur.** DHS S&T, in conjunction with TSA has sponsored a BDO Job Task Analysis (JTA). Outputs of the JTA will include Knowledge, Skills, Abilities, and Other characteristics of BDOs and Training Learning Objectives. These two items will enable TSA to conduct an in-depth training gap analysis. This analysis will begin immediately following completion of the JTA and will take approximately three months to complete. Upon completion of the training gap analysis, TSA will develop detailed project plans with milestones and schedules based on the scope of the overall curriculum development/revision effort.

Sincerely yours,



Jerald E. Levine  
Director  
DHS GAO/OIG Liaison Office

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# Appendix III: GAO Contacts and Staff Acknowledgments

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## GAO Contact

Stephen M. Lord, (202) 512-4379, or [lords@gao.gov](mailto:lords@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, David M. Bruno, Assistant Director, and Jonathan R. Tumin, managed this assignment. Ryan Consaul, Jeff C. Jensen, Kevin Remondini, and Julie E. Silvers made significant contributions to the work. Arthur James, Jr., Amanda Miller, and Douglas Sloane assisted with design, methodology, and data analysis. Chris Dionis assisted with issues related to training. Katherine Davis and Debra Sebastian provided assistance in report preparation; Tracey King and Tom Lombardi provided legal support; and Pille Anvelt and Barbara Hills developed the report graphics.

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