Responses to Government Accountability Office (GAO) Recommendations Outlined in GAO-14-357, "Advanced Imaging Technology: TSA Needs Additional Information before Procuring Next-Generation Systems"

July 20, 2015
Fiscal Year 2015 Report to Congress

Homeland Security

Transportation Security Administration

Message from the Administrator

I am pleased to present the following report, "Responses to Government Accountability Office (GAO) Recommendations Outlined in GAO-14-357, 'Advanced Imaging Technology: TSA Needs Additional Information before Procuring Next-Generation Systems,'" prepared by the Transportation Security Administration (TSA).
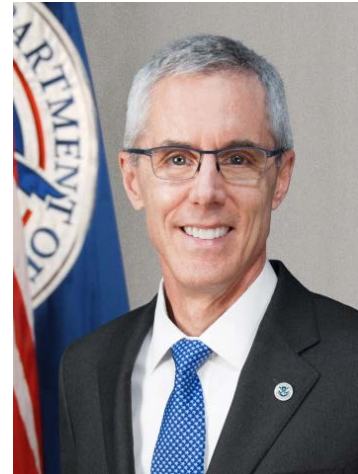
This report was compiled pursuant to the *Fiscal Year* (FY) *2015 Department of Homeland Security* (DHS) *Appropriations Act* (P.L. 114-4). The report addresses each of the recommendations outlined in the March 2014 GAO-14-357 report, "Advanced Imaging Technology: TSA Needs Additional Information before Procuring Next-Generation Systems." The report also describes the steps that TSA is taking to implement acquisition best practices, increase industry engagement, and improve transparency with regard to technology acquisition programs. Prior to releasing the public GAO report in April 2014, a classified version of the report titled, "Advanced Imaging Technology: Changes Needed to Program before Procuring Next Generation Systems," was released in December 2013.

Pursuant to congressional requirements, this report is being provided to the following Members of Congress:

> The Honorable John R. Carter
> Chairman, House Appropriations Subcommittee on Homeland Security
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> The Honorable Lucille Roybal-Allard
> Ranking Member, House Appropriations Subcommittee on Homeland Security
>
> The Honorable John Hoeven
> Chairman, Senate Appropriations Subcommittee on Homeland Security
>
> The Honorable Jeanne Shaheen
> Ranking Member, Senate Appropriations Subcommittee on Homeland Security

Inquiries relating to this report may be directed to me at (571) 227-2801 or to the Department's Deputy Under Secretary for Management and Chief Financial Officer, Chip Fulghum, at (202) 447-5751.

Sincerely yours,

Peter V. Neffenger
Administrator

Executive Summary

TSA began evaluating Advanced Imaging Technology (AIT) in 2007, in an effort to fill an operational security gap resulting from the use of metal detectors as the primary passenger screening technology. Unlike metal detection technology, AIT systems provide the necessary capability to detect a wide range of prohibited items including weapons, explosives, and other metallic and non-metallic threat objects that may be concealed under clothing. To better assess the application of these technologies in the checkpoint environment, TSA conducted field trials of different vendor AIT solutions at multiple airports. Throughout 2007 and 2008, AIT units were utilized in the secondary screening position only, e.g., for passengers who set off alarms when going through the walk-through metal detector.

In 2009, following a failed terrorist attack on a Delta-Northwest flight from Amsterdam to Detroit, TSA began to evaluate AIT systems in the primary screening position as an alternative to the walk-through metal detector to address the threat of non-metallic explosives and other dangerous materials concealed on a person.

This report highlights each GAO recommendation outlined in the March 2014 GAO-14-357 report, "Advanced Imaging Technology: TSA Needs Additional Information before Procuring Next Generation Systems," followed by TSA's response to address and close out the recommendation. These responses demonstrate TSA's establishment of protocols to facilitate the capturing of certain operational data, development of partnerships with the DHS Science and Technology Directorate (S&T), and methods TSA will use to measure AIT system effectiveness. TSA continues to partner with GAO to implement program and performance improvements in AIT and the Passenger Screening Program in general. TSA is actively working on efforts to align goals with key stakeholders such as DHS S&T and industry, establishing a formal process for determining needs, improving implementation of DHS Acquisition policy (Directive 102-01), identifying and training the acquisition workforce, and increasing transparency with industry.

Responses to Government Accountability Office (GAO) Recommendations Outlined in GAO-14-357, "Advanced Imaging Technology: TSA Needs Additional Information before Procuring Next-Generation Systems"

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I. Legislative Requirement

This report is submitted pursuant to the *Fiscal Year* (FY) *2015 Department of Homeland Security* (DHS) *Appropriations Act* (P.L. 114-4), its accompanying Explanatory Statement, and House Report 113-481.

P.L. 114-4 states:

> TRANSPORTATION SECURITY SUPPORT
> For necessary expenses of the Transportation Security Administration related to transportation security support pursuant to the Aviation and Transportation Security Act (Public Law 107–71; 115 Stat. 597; 49 U.S.C. 40101 note), $917,226,000, to remain available until September 30, 2016: Provided, That not later than 90 days after the date of enactment of this Act, the Administrator of the Transportation Security Administration shall submit to the Committees on Appropriations of the Senate and the House of Representatives—
> > (1) a report providing evidence demonstrating that behavioral indicators can be used to identify passengers who may pose a threat to aviation security and the plans that will be put into place to collect additional performance data; and
> > (2) a report addressing each of the recommendations outlined in the report entitled ''TSA Needs Additional Information Before Procuring Next-Generation Systems'', published by the Government Accountability Office on March 31, 2014, and describing the steps the Transportation Security Administration is taking to implement acquisition best practices, increase industry engagement, and improve transparency with regard to technology acquisition programs:
> *Provided further*, That of the funds provided under this heading, $25,000,000 shall be withheld from obligation for Headquarters Administration until the submission of the reports required by paragraphs (1) and (2) of the preceding proviso.

The Explanatory Statement includes the following:

> The bill withholds $25,000,000 from obligation until TSA submits to the Committees a report providing evidence that behavioral indicators can be successfully used to identify passengers who may pose a threat to aviation security, as well as a report addressing GAO's concerns with TSA's Advanced Imaging Technology program.

House Report 113-481 states:

Checkpoint Support

The Committee recommends $103,402,000 for Checkpoint Support, $67,000 below the amount requested and $93,000 above the amount provided in fiscal year 2014. The Committee notes that since its inception, TSA has struggled to deploy technologies at passenger screening checkpoints in an effective and efficient manner. In the case of TSA's Advanced Imaging Technology (AIT) systems, GAO reported in January 2012 that TSA did not fully follow DHS acquisition policies when acquiring AIT, which resulted in DHS approving AIT deployment without full knowledge of TSA's revised specifications for the equipment (GAO-12–644T). On March 31, 2014, GAO published a follow-up report, in which it recommended that TSA not purchase next-generation AIT machines until it, among other things, develops a realistic performance schedule, conducts additional testing and data analysis, better measures system effectiveness, and clarifies which office is responsible for overseeing the IED screening checkpoint drills operational directive (GAO–14–357).

The Committee is concerned that GAO continues to find significant flaws in TSA's AIT program. The Committee notes that H.R. 2719, the Transportation Security Acquisition Reform Act, which passed the House of Representatives on December 3, 2013, would require TSA to implement acquisition best practices, increase industry engagement, and improve transparency with regard to TSA technology acquisition programs such as AIT. The fiscal year 2015 bill prohibits funds from being used to procure AIT systems and withholds $25,000,000 from obligation for Headquarters Administration until TSA submits to the Committee, not later than 90 days after the date of enactment of this Act, a report addressing each of the recommendations outlined in GAO's March 2014 report and describing the steps TSA is taking to implement acquisition best practices, increase industry engagement, and improve transparency with regard to TSA technology acquisition programs.

II. Background

Advanced Imaging Technology (AIT) systems have been a key element of TSA's airport checkpoint security system since December 2009, after an attempted terrorist attack on Delta-Northwest Airlines Flight 253. Compared to alternate people-screening technology, such as walk-through metal detectors, AITs provide enhanced security benefits because they are able to identify nonmetallic threat objects including weapons and explosives masked under layers of clothing. They also provide additional deterrence to potential terrorists and enhanced screening efficiencies when compared to physical resolution pat-downs. AIT serves as a primary screening capability for airport people-screening because of its throughput speed and security effectiveness.

Through FY 2012, TSA had procured 1,000 AIT units. The *Federal Aviation Administration Modernization and Reform Act of 2012* (P.L. 112-95) mandated that TSA use AIT systems equipped with Automated Target Recognition (ATR) software for screening passengers. ATR software installed on AIT systems produces a generic image of the individual being screened that highlights the location of potential anomalies for further inspection. TSA concluded that Rapiscan could not deliver an ATR solution by the mandated deadline. As a result, in FY 2013, TSA removed the 251 non-ATR Rapiscan units from the field to comply with the Act. The current AIT fleet is equipped with ATR software, and ATR is a requirement for all future AIT procurements.

As of March 31, 2015, TSA had 741 first-generation AIT systems deployed in airports throughout the Nation. TSA began testing next-generation (AIT-2) systems in 2013, which have a smaller physical footprint at the checkpoint. TSA awarded an Indefinite Delivery Indefinite Quantity contract delivery order in March 2015 for the procurement of 61 AIT-2 units, and TSA began deploying these AIT-2 systems to the field in the third quarter of FY 2015. Deployment of the AIT-2 units is currently scheduled to be completed in the first quarter of FY 2016. AIT-2 systems that were procured for operational test and evaluation are currently deployed at three airports.

Table 1 provides a detailed breakdown of AIT and AIT-2 procurements by fiscal year.

Table 1. AIT and AIT-2 Procurement History

System Type	Funding Source	Fiscal Year Procured	# of AS&E Units	# of L3 Units	# of Rapiscan Units	# of Smiths Units	Total # of Units Procured	# of Units Removed from Airports[1]	Total # of units Remaining
AIT	FY 2008	2008	3	44	0	0	47	0	**47**
AIT	ARRA	2009	0	0	151	0	151	-151	**0**
AIT	ARRA	2010	0	202	100	0	302	-100	**202**
AIT	FY 2011	2011	0	300	0	0	300	0	**300**
AIT	FY 2011	2012	0	200	0	0	200	0	**200**
AIT-2[2]	FY 2011	2012	3	3	0	3	9	0	**9**
AIT-2[3]	FY 2008/ FY 2014	2015	0	61	0	0	61	0	**61**
TOTALS			**6**	**810**	**251**	**3**	**1070**	**-251**	**819**

Across all transportation security equipment, TSA is investing in systems that balance improvements in operational efficiency, security effectiveness, and passenger satisfaction. As TSA expands risk-based security, there is a greater priority for the integration and automation of people-screening technology to support dynamic capabilities that are intelligence-driven. When procuring additional AIT machines, TSA has taken great care to research thoroughly and invest carefully in order to provide an efficient and comfortable travel experience while ultimately ensuring the security of the Nation's transportation system.

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[1] To comply with the *Federal Aviation Administration Modernization and Reform Act* (P.L. 112-95).
[2] Reflects the Low Rate Initial Production AIT-2 units for testing purposes.
[3] Reflects the first purchase of full-rate production AIT-2 systems for deployment to airports.

III. TSA's Responses to GAO Recommendations

Below is an overview of TSA's responses to the five recommendations made by the Government Accountability Office (GAO).

Recommendation #1: *Clarify which office is responsible for overseeing the Transportation Security Administration's (TSA) Improvised Explosive Device (IED) screening checkpoint drills operational directive, direct the office to ensure enforcement of the directive in conducting these drills, and analyze the data to identify any potential weaknesses in the screening process.*

TSA's Response to Recommendation #1:
TSA concurred with GAO's recommendation and agrees that the oversight of Operations Directive 400-50-1-12A, *IED Screening Checkpoint Drills*, needed to be revisited. To accomplish this, TSA's Office of Security Operations reviewed the Screening Checkpoint operational directives and associated programs that contributed to assessing screening performance with consideration of the findings identified in the GAO report. The Office of Security Operations' ongoing organizational oversight and enforcement responsibilities ensure effective use of the office's screening resources and comply with operational directives; where appropriate, procedures are modified to achieve revised operational goals. TSA's Office of Security Operations and Office of Training and Workforce Engagement participated in this review process.

During this reporting period, the Office of Security Operations completed a review of all programs that contribute to assessing screening performance including organizational oversight, allocation of resources, and enforcement responsibilities.

Table 2 provides a list of programs that were included in this review.

Table 2. List of Reviewed Programs

Program Name	Program Type
Aviation Screening Assessment Program	Testing Program
Presence. Advisements. Communication. Execution.	Testing Program
Covert Testing	Testing Program
IED Checkpoint Drill	Testing Program
IED Baseline Training	Training Program
Transportation Security Specialist-Explosives Delivered In-Service Training	Training Program
IED Impact Training	Training Program
Threat Image Projection Ready X-Ray Sessions	Training Program
IED Training Tools	Training Program

Status of Recommendation #1:
In light of the advancements in training and the establishment of more focused and structured training and assessment programs, the requirement to conduct IED Drills was discontinued. The Office of Security Operations' operations directive 400-50-1-12A was canceled on May 23, 2014. On July 16, 2014, TSA provided GAO with an update indicating that the TSA IED Screening Checkpoint Drills operational directive had been canceled. On November 18, 2014, GAO informed TSA the recommendation was closed as not implemented.

Recommendation #2: Establish protocols that facilitate the capturing of operational data on secondary screening of passengers at the checkpoint to determine the extent to which Advanced Imaging Technology (AIT)-Automated Target Recognition (ATR) system false alarm rates affect operational costs once AIT-ATR systems are networked together.

TSA's Response to Recommendation #2:
TSA concurred with GAO's recommendation. TSA periodically captured operational data on the various types of secondary screening methods, which include pat-downs as a result of AIT-ATR false alarms, used during the screening of passengers at airport checkpoints.

The data elements for each of the various checkpoint processes, to include secondary screening of passengers, are defined in the Checkpoint Data Element standards. TSA monitored, updated, and reported results of captured operational data on the secondary screening of passengers resulting from AIT-ATR false alarms.

Additionally, through the Operational Test and Evaluation (T&E) process of any system, the metrics associated with the process of screening passengers are also evaluated. These data are presented in a System Evaluation Report (SER), which contains the evaluation of the system's effectiveness and suitability. This evaluation is based on those metrics in addition to data from other reliable and relevant test events (e.g., Qualification T&E).

From December 2013 through January 2014, TSA collected data during the AIT-1 Tier II Follow-on Operational T&E to characterize all aspects of secondary screening, specifically the alarm rate and resulting resolution pat-down rate. During Follow-on Operational T&E, data were collected specifically on the secondary screening of passengers at the checkpoint for various types of secondary screening methods. A large portion of the system evaluation characterized the impacts (e.g., throughput, staffing, etc.) of these elevated secondary screening procedures. These data were then compared to the baseline (Tier I) rates to determine effectiveness and suitability of the upgrade. Operational impact analysis was accomplished by a working group comprising the User representatives and consisting of TSA Office of Security Operations and Office of Security Capabilities personnel.

TSA also implemented GAO's recommendation as a part of the AIT-2 T&E for the L-3 Communications Pro Vision 2 AIT-2 systems. During that test, false alarm rates were evaluated against existing staffing levels to determine if there was an adverse effect of the new systems on that staffing level. Specific results were outlined within the SER (dated January 16, 2015) for the L-3 Pro Vision 2 AIT-2 system.

Status of Recommendation #2:
In January 2015, TSA informed GAO that the AIT-2 SER will provide evidence of implementation of this recommendation as part of AIT-2 T&E process. The SER was released to GAO in April 2015. In May 2015, TSA received feedback from GAO that the audit team had follow-up questions, and requested additional information for consideration before closing the recommendation. TSA continues to communicate with GAO.

Recommendation #3: Before procuring AIT-2 systems, measure system effectiveness based on the performance of the AIT-2 technology and screening officers who operate the technology, while taking into account current processes and deployment strategies.

TSA's Response to Recommendation #3:
TSA concurred with GAO's recommendation. TSA considered several factors when measuring system effectiveness prior to procuring AIT-2 systems, including:

- Documenting and leveraging deployment strategies when developing technology test requirements used to measure system effectiveness;
- Taking into consideration airport needs and conditions, such as ceiling height and checkpoint space, and documenting required equipment dimensions;
- Considering and documenting TSA security operations processes and procedures used within the airport environment and considering such when developing technology test requirements; and
- Gathering feedback from transportation security officers regarding technology deployment needs and concerns.

TSA's testing process enables the agency to determine if technologies meet required standards and are feasible for use in the airport environment. TSA's AIT-2 systems were tested at the Transportation Security Laboratory and TSA Systems Integration Facility in laboratory environments to determine effectiveness. At the completion of testing, TSA's laboratory and operational test results are documented in formal test reports and used by TSA in determining if a system is operationally effective and suitable for use within an airport environment. A TSA systems evaluator prepares a formal SER that documents system effectiveness using information from the laboratory and operational test reports. The SER states whether or not the AIT-2 has an acceptable operationally effective and suitable rating for use within an airport environment.

Concept of operations and formal operational and functional requirements documents are taken into account when developing the test methodology. The concept of operations is also where the processes and deployment strategy for the technology are taken into account.

Status of Recommendation #3:
In January 2015, TSA informed GAO that the AIT-2 SER will provide evidence of implementation of Recommendation #3 as part of AIT-2 T&E. The SER was released to GAO in April 2015. In May 2015, GAO requested additional information from TSA for consideration before closing the recommendation. TSA continues to communicate with GAO.

Recommendation #4: *Before procuring AIT-2 systems, use scientific evidence and information from Department of Homeland Security's (DHS) Science and Technology Directorate, and the national laboratories, as well as information and data provided by vendors to develop a realistic schedule with achievable milestones that outlines the technological advancements, estimated time, and resources needed to achieve TSA's Tier IV end state.*

TSA's Response to Recommendation #4:
TSA concurred with GAO's recommendation. Per the recommendation, TSA initiated an effort to complete an AIT roadmap that:

- Forecasted technology progression through detection tiers;
- Estimated the cost to mature; and
- Provided results in a timeline/roadmap with supporting narrative.

To capture TSA's future investment pursuits and foster a dialogue with industry stakeholders, the roadmap outlines the feasibility of AIT tiered detection enhancements and technology upgrades over the next 5 years. The purpose of this AIT maturation roadmap is to:

> *Develop a potential maturation blueprint highlighting possible evolution and development areas of AIT systems and provide agency and industry stakeholders with valuable information addressing TSA's goals with respect to its Trade Space Framework. Trade Space components include security effectiveness, operational efficiency, passenger satisfaction, industry vitality, and fiscal policy issues.*

The roadmap outlines TSA's current state and future vision for people-screening capabilities and is designed to serve as a broad guide and input to TSA's long-term investment and potential acquisition strategy for AIT systems. Activities described are either directed toward strengthening existing AITs or furthering alternate systems and

enabling technologies to realize enhanced screening capabilities. The roadmap documents historical progression (to include a progression of more advanced Tiers) and supports future maturation forecasts for AIT. The roadmap also included an assessment that quantifies the level of investment required and an estimate of the time needed to allow the technologies to evolve to the next levels.

A variety of experts were engaged from academia, S&T, and national laboratories to gain insights on technology limitations, possible future concepts, and potential timelines for achieving advances in capability. Release of this roadmap is expected to enable better stakeholder and industry collaboration and engagement as well as improve transparency with regard to TSA's acquisition process. The completed roadmap was posted to FBO.gov and delivered to GAO in February 2015.

Status of Recommendation #4:
As of June 2015, the recommendation was still open pending additional discussion within GAO. TSA provided additional supporting documentation, which is classified, to GAO in June 2015, which further demonstrates that TSA has implemented the recommendation.

The classified audit report, GAO-14-83C, contains an additional GAO recommendation which is not addressed in the public GAO report, GAO-14-357, due to the sensitive nature of the information.

IV. Conclusion

To address the ever-evolving threats to aviation security, TSA continues to enhance existing technologies, acquire and integrate new technologies, and use intelligence-based and risk-based processes to screen passengers more effectively and efficiently. The information provided in this response to GAO's recommendations demonstrates how TSA is carefully identifying, testing, procuring, deploying, and maintaining equipment that is capable of detecting threats concealed on passengers. TSA will continue to work with GAO to implement and/or close the recommendations.

V. Acronyms

Acronym	Definition
AIT	Advanced Imaging Technology
AIT-2	Next Generation Advanced Imaging Technology Systems
ARRA	American Recovery and Reinvestment Act
ATR	Automated Target Recognition
DHS	Department of Homeland Security
FY	Fiscal Year
GAO	Government Accountability Office
IED	Improvised Explosive Device
SER	System Evaluation Report
S&T	Science and Technology
TSA	Transportation Security Administration
T&E	Testing and Evaluation