

Changes in Airport Passenger Screening Technologies and Procedures: Frequently Asked Questions

Bart Elias

Specialist in Aviation Policy

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Introduction

In the autumn of 2010, the Transportation Security Administration (TSA) began deploying new technologies and procedures for screening passengers at airport checkpoints. Reports of negative public reaction to some of these changes have prompted intense congressional interest in TSA passenger screening. This report addresses some of these concerns.

What Changes Are Being Made?

During 2010, TSA introduced whole body imaging (WBI) systems at airport checkpoints around the United States. Previously, the systems were used only on a trial basis at a small number of airports. They are now in use as a primary screening method at most busy passenger airports.

These systems, which the TSA refers to as advanced imaging technology (AIT) systems, capture an image of what lies underneath an individual's clothing. Critics have referred to this as a "virtual strip search." If an individual considers this screening method too invasive or revealing or prefers not to undergo AIT imaging for any other reason, TSA provides the option of submitting to a pat-down search instead.

In response to aircraft bombing attempts and intelligence regarding terrorist explosives concealment methods, TSA also has changed pat-down procedures to more thoroughly inspect individuals for concealed items. The use of pat-down procedures has also become more frequent, including searches conducted at gates immediately prior to boarding.

What Prompted These Changes?

Because of improvements to prevent airline hijackings made since 9/11, TSA now regards explosives as the main threat to passenger airliners. The inability of walk-through metal detectors to screen for explosives has been seen as a critical weakness in aviation security.

In 2004, the 9/11 Commission recommended that TSA give priority attention to implementing technologies and procedures for screening passengers for explosives. The bombing of two Russian airliners in August 2004, shortly after the release of the commission's report, focused considerable attention on this issue. Based on the 9/11 Commission's recommendation, Congress included provisions in the Intelligence Reform and Terrorism Prevention Act of 2004 (P.L. 108-458) directing TSA to improve checkpoint screening technologies capable of detecting explosives. TSA initially tested walkthrough portals that analyze samples of air passed over individuals for traces of explosives. However, TSA considered these systems to be unreliable in the airport environment and has more recently focused on WBI technologies.

¹ For example, Jessica Ravitz, "Airport Security Bares All, Or Does It," CNN.com/travel, May 18, 2009, available at http://edition.cnn.com/2009/TRAVEL/05/18/airport.security.body.scans/?iref=mpstoryview.

² National Commission on Terrorist Attacks Upon the United States. *The 9/11 Commission Report*, New York, NY: W. W. Norton & Co., 2004.

On December 25, 2009, an air passenger, Umar Farouk Abdulmutallab, attempted to ignite an explosive device concealed in his underwear while on board a Detroit-bound commercial flight from Amsterdam. This incident prompted additional changes to security screening procedures. In addition to increasing its reliance on WBI as a primary screening technology, TSA has changed its pat-down search procedures and increased the use of pat-down searches.

What Is Advanced Imaging Technology and How Is It Being Used?

AIT systems are commonly referred to as whole body imaging systems or full-body scanners. The technology does not specifically identify explosives, but can reveal concealed items that would not be detected by walkthrough metal detectors, including explosives and non-metallic weapons. If a concealed item is detected, TSA procedures require that screeners use additional inspection methods to determine whether the item is a threat. These methods may include pat downs, visual inspection, or swabbing an individual's skin and/or clothing to obtain a sample to analyze for traces of explosives.

TSA has approved two AIT systems for operational use. One of those systems, the Rapiscan Secure 1000, uses a technology called X-ray backscatter; the other, the L-3 ProVision, uses millimeter wave imaging. Most fielded versions of these systems require the individual to assume only one pose to generate images, allowing screeners to detect any concealed items the person may be carrying. The ProVision system acquires multiple images whereas the Rapiscan Secure 1000 takes two images: a front view and a back view. A third system, the AS&E Smartcheck Z Backscatter system, has been field tested at airports but has not been approved by TSA for large-scale acquisition. One disadvantage of this system is that it requires the individual to stand in two poses to render front-view and rear-view images. Other vendors manufacture whole-body imaging systems using a variety of technologies, but these generally do not have sufficient image resolution and operational performance in the airport environment to satisfy TSA.

What Is the Funding for AIT?

In FY2008, Congress established an airport checkpoint screening fund providing \$250 million for advanced checkpoint technologies (see P.L. 110-53). Additional funding was provided in the regular FY2009 appropriations. The American Recovery and Reinvestment Act (ARRA) of 2009 (P.L. 111-5) included \$1 billion for aviation security, of which \$700 million went to accelerate the acquisition and deployment of whole-body imaging systems. In FY2010, \$117 million was appropriated and the President's budget request for FY2011 sought \$344 million for checkpoint technologies. Although these amounts also fund the purchase of next-generation X-ray equipment for screening carry-on bags, AIT accounts for a large share of checkpoint technology acquisition.

How and Where Is AIT Being Deployed?

In October 2007, TSA began its initial field test of WBI screening at Phoenix Sky Harbor Airport.³ In that trial, an X-ray backscatter system was offered as an alterative to pat-down searches for passengers selected for additional secondary screening. More extensive testing at various airports using both X-ray backscatter and millimeter wave systems commenced in 2008. Over the past two years, TSA has significantly expanded its deployment of AIT systems. As of October 2010, 385 AIT units had been deployed to 68 airports. It is expected that about 450 units will be in service by December 31, 2010. The President's budget request for FY2011 sought funding for 503 additional units, to bring the nationwide total to roughly 1,000. While it is unclear what the nationwide mix of systems will be once all systems are deployed, individual airports appear to be receiving either millimeter wave or backscatter systems, but not both. While most large airports will have some AIT systems by the end of calendar year 2010, the systems will not be used in all screening lanes. AIT will probably not be deployed at small airports in the near future. There are more than 750 screening checkpoints and over 2,000 screening lanes across 450 airports in the United States. TSA's goal is to have 1,800 units deployed across the country by the end of FY2014. It refers to this number as its full operating capability for AIT. An updated list of airports with AIT technology is available on TSA's website.

Where Else Is AIT Being Deployed?

AIT systems are in operational use at a few foreign airports, primarily in Europe. In many cases, they are used solely to screen passengers traveling on U.S.-bound flights. Canada uses the systems in selected airports to screen both domestic and international passengers. The procedures and privacy protections vary from country to country. In addition to aviation security applications, AIT is being used at state and federal courthouses, correctional institutions, embassies, and border crossings, and by the Department of Defense, mostly overseas.

Is AIT Effective?

TSA generally regards AIT as an effective solution for detecting concealed threats carried by passengers. Its heavy investments in the technology indicate TSA's commitment to making AIT a central part of its strategy for detecting explosives at passenger checkpoints. Experts are divided about the effectiveness of AIT systems, and it remains unclear whether a WBI scan would have detected the explosives used in the 2009 Christmas Day bombing attempt. There is a separate debate as to whether the money appropriated for WBI would be better spent on intelligence-gathering.

³ John Lettice, "Virtual Strip Search' Arrives at JFK and LAX," *The Register* (UK), April 22, 2008.

⁴ http://www.tsa.gov/approach/tech/ait/fags.shtm.

⁵ Spencer S. Hsu, "GAO Says Airport Body Scanners May Not Have Thwarted Christmas Day Bombing," *Washington Post*, March 18, 2010.

⁶ Jessica Ravitz, "Airport Security Bares All, Or Does It?," CNN.com/travel, May 18, 2009, available at http://edition.cnn.com/2009/TRAVEL/05/18/airport.security.body.scans/?iref=mpstoryview.

Is AIT Efficient?

TSA procedures for screening at walkthrough metal detectors can be cumbersome. Passengers are typically instructed to remove all metallic items, including cell phones, keys, coins, and sometimes even jewelry and belts with metal buckles. Since a December 2001 shoe-bombing attempt, passengers have been required to remove their shoes and place them with other carry-on items for X-ray screening. When passengers forget to remove metallic objects, the system can be slowed by nuisance alarms that must be resolved through secondary screening.

The procedures for AIT, as currently implemented, do not eliminate any of these requirements and impose additional requirements to remove non-metallic items, such as wallets, from pockets to minimize false positive determinations. Also, unlike metal detectors that passengers can move through quickly, WBI systems require passengers to assume a pose in front of the imager for several seconds. Since the systems are new and passengers are largely unfamiliar with them, TSA screeners must provide detailed instructions, adding to the time required to screen a passenger. The inefficiencies of WBI could lead to longer security lines, particularly as more of these systems are rolled out. Additional delays could prompt complaints even from passengers who do not object to the screening methods. TSA points out, however, that AIT screening is much quicker and more efficient than a pat-down search.

TSA could minimize delays by using WBI only at times when security lines are short. However, such a strategy could lead to vulnerabilities if terrorists carrying explosives could time their entry into a screening lane to minimize the probability that they would undergo WBI screening.

What Specific Changes Have Been Made to Pat-Down Procedures?

In October 2010, TSA announced revisions to its pat-down procedures to more thoroughly examine individuals for concealed threats. Previously, TSA procedures called for screeners to use only the backs of their hands to inspect passengers. The new procedures involve the use of the fingers and palm to search for concealed items and more detailed tactile inspection of areas higher on the thigh, in the groin area, and under women's breasts. The procedures routinely involve touching of breasts, buttocks, and genitals. As with prior procedures, all pat-downs are conducted by a same-sex screener, and passengers may opt for a screening in a private area. In congressional testimony on November 17, 2010, TSA Administrator John Pistole conceded that the methods are clearly more invasive than prior methods, but defended them as necessary to detect concealed threats and indicated that he has no intention of modifying the new techniques.

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⁷ Transportation Security Administration, TSA Statement on New Pat-down Procedures, October 28, 2010.

⁸ Derek Kravitz, "New Searches Too Personal for Some Air Travelers," Washington Post, November 13, 2010.

Why Do the New Screening Procedures Raise Privacy Concerns?

Use of current whole body imaging technologies requires that a TSA screener view an image of a passenger's entire body. In the United States, this approach has met with objections from groups such as the American Civil Liberties Union, which has urged Congress to ban the use of whole body imaging technologies as a method for primary screening on the basis that "[p]assengers expect privacy underneath their clothing and should not be required to display highly personal details of their bodies." In the United Kingdom, questions have been raised about whether whole body imaging of children violates child pornography laws. So far, this particular aspect of privacy has not been the subject of detailed policy discussion in the United States, and children are not categorically excluded from WBI screening.

With regard to pat-down procedures, TSA has faced allegations of groping, singling out female passengers, and other abuses. In 2005, an extensive investigation by the Department of Homeland Security Office of Inspector General found that TSA adequately advised passengers of their rights under the pat-down procedures, and appropriately accommodated those rights. It also found that the TSA's screener training for pat-down searches was adequate and that pat-downs were performed on proportionate numbers of males and females. ¹¹ TSA logs and investigates complaints and tracks trends in complaint data to identify areas of concern and take remedial action as needed. Nevertheless, TSA's new, more thorough pat-down procedures have brought complaints, as similar touching could constitute sexual assault in other circumstances.

Courts characterize a routine search conducted at a security checkpoint as a warrantless search, subject to the constitutional prohibition of "unreasonable searches and seizures" by the federal government. Such a warrantless search, also known as an administrative search, has been found acceptable if it is "no more intrusive or intensive than necessary, in light of current technology, to detect weapons or explosives," is confined to that purpose, and if individuals may avoid the search by electing not to fly. Privacy arguments have been made about other airport screening procedures in the past, to no avail. Nevertheless, more specific policy and legal analysis in the current context may be needed to address whether the new procedures are no more intrusive or intensive than necessary.

⁹ Statement of Timothy D. Sparapani, ACLU Legislative Counsel, Before the Senate Committee on Commerce, Science, and Technology, Regarding the U.S. Transportation Security Administration's Physical Screening of Airline Passengers and Related Cargo Screening, April 4, 2006.

¹⁰ Alan Travis, "New Scanners Break Child Porn Laws," *Guardian* (UK), January 4, 2010.

¹¹ Department of Homeland Security, Office of Inspector General, *Review and Audit of the Transportation Security Administration's Use of Pat-Downs in Screening Procedures (REDACTED)*, November 2005, OIG-06-10.

¹² United States v. Davis, 482 F.2d 893, 908 (9th Cir. 1973).

What Has Been Done or Proposed to Allay Privacy Concerns?

TSA has long been aware of the potential privacy concerns regarding WBI systems. To allay some of these concerns, the WBI systems used by TSA apply privacy filters that may blur facial features and sensitive areas. Some systems use computer algorithms to render a "chalk outline" sketch of the individual, body features, and concealed items.

TSA also has implemented procedures for remote viewing of WBI images. Under these procedures, the screener viewing the images cannot see the individual that was imaged and views the images in an enclosed space that is not in public view. Also, the systems in use by TSA have no capacity to store or transmit images, and screeners are prohibited from having any cameras or recording devices in their possession while viewing WBI images. Under TSA procedures, images are immediately deleted after the individual has been screened.

Proposed enhancements to further address the privacy issue involve technical advances. With fully or semi-automated threat detection capabilities, screeners might not have to view images at all, or might only have to view certain portions of an image to respond to automatically detected threats and anomalies. While some automated detection capabilities are being tested, these are not currently considered sufficiently reliable to replace human image observers. In the interim, additional distortion of the images to make them less revealing without compromising their ability to detect potentially dangerous concealed objects has been suggested.¹³

What Concerns Have Been Raised Regarding Religious or Cultural Sensitivities?

TSA does not exempt individuals from screening procedures on the basis of religion or culture. Therefore, an individual must agree to either WBI screening or a pat-down search, even if these methods conflict with religious beliefs or cultural practices.

TSA has particular security concerns regarding loose-fitting clothing and headwear that could potentially conceal threats including explosives. Members of certain religious groups, including some Muslims, and certain cultures, including some African cultures, often wear loose fitting clothing. Additionally, certain religions and cultures sometimes require individuals to wear head coverings in public. Examples include hijabs worn by some Muslim women, yarmulkes worn by some Jewish men, and turbans worn by members of various religious groups.

TSA does not prohibit any individual from wearing loose-fitting clothing or head coverings when passing through a screening checkpoint. However, TSA screeners may select individuals for additional screening if they consider their clothing to be loose fitting enough or large enough to conceal a prohibited threat item. Similarly, TSA screeners may require additional screening and physical inspection of headwear. Because of these procedures, specific groups may believe that they are being targeted for additional screening on the basis of ethnic or cultural identity rather

¹³ Ashley Halsey III, "A Fix for TSA Scanning Worries?," Washington Post, November 22, 2010.

than on the basis of their loose fitting clothing or headwear. Particular concerns may also arise during pat-down searches if passengers object to touching by screeners on religious or cultural grounds.

Does WBI Have Potential Human Health Effects?

Potential human health concerns apply to one of the two WBI systems now used by TSA, X-ray backscatter systems. TSA contends that the levels of ionizing radiation emitted by approved X-ray backscatter systems are well below levels considered safe for human exposure. The radiation exposure from a single X-ray backscatter image is said to be equivalent to the naturally occurring radiation received during two minutes flying at altitude aboard a commercial airliner. Approved backscatter systems have been evaluated by the Food and Drug Administration's Center for Devices and Radiological Health, the National Institute of Standards and Technology, and the Johns Hopkins University Applied Physics Laboratory.

The controversy over exposure to X-ray backscatter persists. In April 2010, faculty members from the University of California, San Francisco, including prominent researchers in biochemistry, biophysics, X-ray imaging, and cancer research, expressed their concerns in a letter to President Obama's assistant for science and technology, John P. Holdren. They suggested that while the radiation dose received from X-ray backscatter imaging would be safe if it were distributed throughout the body, it is instead concentrated only on the skin and underlying tissue, such that "the dose to the skin may be dangerously high." The letter stated that older travelers and those with compromised immune systems may be at particular risk; that some females may be at higher risk of developing breast cancer; that the potential health effects on children, adolescents, pregnant women, and fetuses have not been fully assessed; that the proximity of the testicles to the skin raises concerns over possible sperm mutation; and that the effects on the cornea and the thymus gland have not been determined. They also cautioned that a system malfunction could potentially cause a very high radiation dose to be concentrated on single spot. The TSA and the FDA provided a lengthy response to the letter asserting that the potential health risks from full-body screening using approved systems are minuscule, and that extensive independent safety data confirm that the systems do not present significant risk to public health. 16

The millimeter wave systems used by TSA do not emit ionizing radiation, the type of radiation usually considered to have sufficient energy to modify the molecular structure of cells, which has been linked to various forms of cancer.¹⁷ They therefore have not raised the same health concerns.

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¹⁴ http://www.tsa.gov/approach/tech/ait/faqs.shtm.

¹⁵ John W. Sedat, Ph.D., Marc Shuman, M.D., David Agard, Ph.D., and Robert Stroud, Ph.D., Letter to Dr. John P. Holdren, Assistant to the President for Science and Technology, April 6, 2010, available at http://www.whitehouse.gov/sites/default/files/microsites/ostp/ucsf-jph-letter.pdf.

¹⁶ Department of Health and Human Services, Food and Drug Administration, Center For Devices and Radiological Health. Letter to Dr. John P. Holdren from John L. McCrohan, Deputy Director for Technical and Radiological Initiatives, and Karen R. Shelton Waters, Deputy Assistant Administrator/ Chief Administrative Officer, Transportation Security Administration, October 12, 2010, available at http://www.whitehouse.gov/sites/default/files/microsites/ostp/fda-backscatter-response.pdf.

¹⁷ American Cancer Society, *Radiation Exposure and Cancer*, available at http://www.cancer.org/Cancer/Ca

What Screening Options Do Passengers Have?

Statutes require TSA to administer the screening of passengers and property entering security controlled areas of airports. The statutes give TSA authority to define screening requirements subject to certain criteria. ¹⁸ Individuals entering security controlled areas without submitting to applicable screening procedures may be subject to civil and criminal penalties. ¹⁹

Under its screening procedures, TSA allows those individuals selected to undergo WBI screening to instead opt to undergo a pat-down search. In some cases, passengers opting for WBI screening during primary screening may subsequently be required to undergo a pat-down search if there are anomalies in their images. For example, well-known humorist Dave Barry reported that he was instructed to undergo secondary pat-down screening after being told he had a "blurred groin." ²⁰

Once selected to undergo one of the enhanced screening methods, passengers are not given the option of selecting screening using a walk-through metal detector. A passenger has the option to decline all screening, in which case the boarding pass would typically be confiscated; the individual cannot simply exit from the screening area and then enter a different security lane in an attempt to avoid WBI screening or a pat-down search. If a passenger elects not to proceed with WBI screening or a pat-down search, then any refund or re-ticketing is handled by the airline, subject to the specific terms of the contract of carriage between the passenger and the airline. This situation poses a considerable dilemma for individuals uncomfortable with both WBI screening and pat-down searches.

It is possible that refusing both screening methods, particularly if done on repeated occasions, could result in a passenger being placed on either the automatic selectee list, where he or she would be subject to enhanced screening every time, or the "no-fly" list, which would bar the individual from flying on commercial airliners altogether.

What If Passengers Have a Specific Complaint About Screening?

TSA's Office of Civil Rights and Liberties is internally responsible for investigating claims of violations during checkpoint screening. Such claims may include violations of civil liberties, such as harassment, or violations of civil rights, such as discrimination on the basis of race, ethnicity, age, religion, gender, disability, or sexual orientation. If passengers believe their rights have been violated, TSA encourages them to immediately notify a TSA supervisor or customer service manager.

After traveling, a passenger may file a formal complaint describing an incident with the TSA Office of Civil Rights and Liberties External Compliance Division. ²¹ Complaints may also be

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¹⁸ See 49 U.S.C. § 44901.

¹⁹ See 49 U.S.C. § 46314.

²⁰ "Humorist Dave Barry and His TSA Pat-Down," All Things Considered, NPR, November 19, 2010.

²¹ Transportation Security Administration, Office of Civil Rights and Liberties (TSA-6), External Compliance Division, 601 S. 12th Street, Arlington, VA 20598; e-mail: TSA.OCR-ExternalCompliance@dhs.gov.

filed with the parent Department of Homeland Security's Office for Civil Rights and Civil Liberties. ²² TSA indicates that it will process external complaints filed up to 180 days after an alleged incident, but notes that delays in filing a complaint may significantly limit its ability to conduct a fact-finding investigation. Based on its investigation, the TSA may take disciplinary action or other remedial action, such as additional screener training.

What Alternative Screening Techniques Are Available?

The primary alternative to WBI for explosives screening is explosives trace detection technologies, particularly walkthrough explosives trace detection portals. TSA conducted field tests of this technology in 2004. However, citing reliability problems, TSA suspended further deployment, and it has not sought to acquire additional trace portal systems.

Canine teams offer another possible option for explosives detection. TSA, in coordination with state and local law enforcement, has, in total, more than 600 explosives detection canine teams, about 80% of which focus on aviation and air cargo screening. It plans to field more than 1,000 teams, with 90% focused on aviation, by the end of FY2011. However, these teams are not used routinely for screening passengers and spend most of their time inspecting cargo and baggage and patrolling airport terminals. Although canine teams may be less objectionable to some individuals uncomfortable with WBI and pat-down searches, some individuals have a fear of or allergies to dogs. There also may be religious and cultural sensitivities regarding the use of dogs to search individuals. Large numbers of canine teams would be needed to make this a viable option for screening large numbers of air travelers. Further research may be needed to determine if canines provide an adequate level of screening. One complication is that dogs trained to sniff out explosives would not be capable of detecting other threats, such as nonmetallic weapons.

Have These Issues Been Addressed in Legislation?

In 2009, Representative Chaffetz introduced the Aircraft Passenger Whole-Body Imaging Limitations Act (H.R. 2027, 111th Congress), which would prohibit the use of WBI for routine screening and would assure passengers the option to select a pat-down search. The bill would also prohibit the storage, transfer, sharing, or copying of any image of a passenger generated by a WBI screening system. This proposal was offered as an amendment (H.Amdt. 172) to the Transportation Security Administration Authorization Act (H.R. 2200, 111th Congress) and was included in the version of that bill passed by the House on June 4, 2009 (see Section 215).

In contrast, Senator Bennett offered the Securing Aircraft From Explosives Responsibly: Advanced Imaging Recognition (SAFER AIR) Act of 2010 (S. 3536, 111th Congress) on June 24, 2010. That measure calls for the expeditious deployment and use of AIT and other advanced screening technologies for primary screening of aircraft passengers. Under provisions of the bill, passengers would have the option of passing through a metal detector and undergoing pat-down screening instead of undergoing AIT screening.

²² Department of Homeland Security, Office for Civil Rights and Civil Liberties, Review and Compliance, 245 Murray Lane, SW, Building 410, Mail Stop #0190, Washington, DC 20528; e-mail: civil.liberties@dhs.gov.

Even though S. 3536 would require AIT to be used as a primary screening method, whereas H.R. 2027 and H.R. 2200 would prohibit it from use as a primary screening method, the bills have in common several concepts for protecting privacy. Many of these provisions parallel current TSA practices.

On November 17, 2010, Representative Paul introduced the American Traveler Dignity Act of 2010 (H.R. 6416, 111th Congress). This bill would not allow TSA, TSA screeners, private airport security screeners, or others involved in the screening process to claim immunity from prosecution in a criminal or civil proceeding arising as the result of whole-body screening or a pat-down search. Representative Paul, in discussing the legislative proposal, asserts that TSA screeners should not be immune from laws pertaining to sexual assault; child pornography; and the endangering of others through the use of radiation-emitting machinery. ²³

Author Contact Information

Bart Elias Specialist in Aviation Policy belias@crs.loc.gov, 7-7771

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²³ Representative Ron Paul, *Introducing the American Traveler Dignity Act*, available at http://paul.house.gov/index.php?option=com_content&task=view&id=1796&Itemid=60.