



February 2021

AIRPORT WORKER SCREENING

TSA Could Further Strengthen Its Approach to Estimating Costs and Feasibility of Security Measures



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GAO@100 Highlights

Highlights of [GAO-21-273](#), a report to congressional committees

Why GAO Did This Study

Any of the 1.8 million airport workers with unescorted access to security-restricted areas of the nation's airports could pose an "insider threat." The TSA Modernization Act (Act) required TSA to submit a study examining the cost and feasibility of enhanced worker screening measures. In its September 2020 study, TSA determined that implementing these measures is feasible and estimated implementation costs of \$2.9-\$3.6 billion, with ongoing annual costs of \$2.5-\$3.1 billion.

The Act also included a provision for GAO to review the study's quality and reliability. This report addresses the extent to which TSA, in its 2020 study, (1) followed best practices to comprehensively estimate the costs of implementing enhanced airport worker screening measures and (2) assessed the feasibility of implementing such measures.

GAO reviewed TSA's study and documents of the underlying methods, data, and assumptions; compared the study to best practices of a comprehensive cost estimate—a foundational characteristic of reliability; and interviewed officials from TSA, an industry advisory committee, and airports with worker screening programs.

What GAO Recommends

GAO recommends that TSA (1) issue guidance that staff consider following best practices from GAO's cost estimating guide for future estimates, and (2) issue guidance on feasibility assessments. TSA agreed with our recommendations.

View [GAO-21-273](#). For more information, contact Triana McNeil at (202) 512-8777 or mcnelt@gao.gov

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TSA Could Further Strengthen Its Approach to Estimating Costs and Feasibility of Security Measures

What GAO Found

The Transportation Security Administration (TSA), in its 2020 study estimating the cost of implementing enhanced airport worker screening measures, followed most of the best practices for a comprehensive cost estimate—one of four characteristics of a high-quality, reliable estimate, according to GAO's *Cost Estimating and Assessment Guide*. For example, while TSA documented its assumptions, it did not include a standard work breakdown structure or dictionary. Without these, TSA cannot ensure its estimates do not omit or double count any elements. TSA officials responsible for developing the estimate said they were unaware of GAO's cost estimating guide. Instead, they followed guidance from the Office of Management and Budget (OMB) on regulatory impact analysis, because enhanced worker screening is a conceptual rather than established program. However, OMB has separate guidance on cost estimates, which recommends following GAO's cost estimating guide in order to meet most cost estimating requirements. TSA officials said that our cost estimating guide could be helpful to consider when developing future cost estimates. Issuing guidance to ensure staff consider following best practices will better position TSA to develop future estimates that are comprehensive to inform policy decisions.

Examples of Airport Worker Screening and Supplemental Measures in the Transportation Security Administration's (TSA) September 2020 Cost Estimate and Feasibility Assessment



Source: GAO presentation of TSA information. | [GAO-21-273](#)

In its 2020 study, TSA also used incomplete information to assess the feasibility of implementing enhanced airport worker screening. First, TSA did not include local airport constraints—such as availability of space for screening operations—that it stated could influence feasibility. Second, TSA's assessment relied on the perspectives of and experiences at large airports, which may not be applicable to smaller airports. TSA officials said they believed the feasibility assessment was sufficient and there was no other formal agency guidance for how to conduct feasibility studies. However, officials said that such guidance could be useful for future assessments. Issuing guidance on assessing feasibility will help TSA ensure its future feasibility assessments are consistent and based upon complete information.

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Abbreviations

| | |
|-------|---|
| ASAC | Aviation Security Advisory Committee |
| ATLAS | Advanced Threat Local Allocation Strategy |
| DHS | Department of Homeland Security |
| ICAO | International Civil Aviation Organization |
| OMB | Office of Management and Budget |
| PIN | Personal Identification Number |
| TSA | Transportation Security Administration |

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February 25, 2021

Congressional Committees

The Transportation Security Administration (TSA) estimates that there are more than 1.8 million airport workers with unescorted access to security-restricted areas of the nation's airports.¹ These workers may wittingly or unwittingly misuse or allow others to misuse their access to sensitive areas or knowledge of security procedures to exploit vulnerabilities and potentially cause harm. For example, in July 2019, an aircraft mechanic was charged with willfully attempting to damage an aircraft. Additionally, in August 2018, a ground services agent commandeered a small aircraft, which subsequently crashed.

TSA has sought to mitigate such "insider threats" by conducting random physical screening of airport workers at mostly larger airports from 2007 to 2020, and at all TSA-regulated airports since 2020, and by requiring most airport operators to perform random worker screening, among other efforts. We reported in 2020 that at some airports, operators have chosen to implement screening programs that require nearly all airport workers to be physically screened prior to entering security-restricted areas.² This is commonly known as "full" worker screening.³

¹For the purposes of this report, an "airport worker" is an employee, contractor, or representative of an airport operator, U.S. or foreign-flagged (i.e., domestic or foreign) air carrier (including flight and cabin crew), vendor, concessionaire, tenant, government agency (including TSA), entity in the air cargo supply chain, or other entity who may at any time work or conduct operations at an airport or areas adjacent to or connected with an airport (including an entity's supply chains) subject to regulation by TSA. For the purposes of this report, "security-restricted area" is a general term that encompasses areas of a TSA-regulated airport, identified in an airport operator's TSA-approved security program, for which access is controlled and limited and includes areas accessible to passengers who have passed through a security checkpoint.

²GAO, *Aviation Security: TSA Could Strengthen Its Insider Threat Program by Developing a Strategic Plan and Performance Goals*, [GAO-20-275](#) (Washington, D.C.: February 10, 2020). See Table 1 of [GAO-20-275](#) for examples of insider threat incidents from 2013 to 2019.

³The Aviation Security Advisory Committee (ASAC) draws a distinction between "full" and "100 percent" worker screening. 100 percent screening is defined as screening all airport workers with no exceptions, while full worker screening typically exempts some workers, such as law enforcement and first responders.

A provision in the TSA Modernization Act (Act), enacted on October 5, 2018, required TSA to produce a study within one year examining the cost and feasibility of implementing enhanced airport worker inspection measures (screening measures) at all access points between non-secured and security-restricted areas at a statistically significant number of TSA-regulated airports.⁴ These worker screening measures include the use of equipment, such as walk-through metal detectors and explosives trace detection equipment to screen all workers, and access controls, such as closed-circuit television cameras and secure doors, among other things.⁵ Further, the study was to include, to the extent practicable, additional assessments and comparisons of the security effectiveness and operational efficiency of various screening measures and technologies, among others, which we discuss in appendix I. TSA submitted its study to relevant congressional committees on September 30, 2020.⁶

The Act included a provision for us to assess the quality and reliability of TSA's study.⁷ This report evaluates the extent to which TSA, in its 2020 study on implementing enhanced airport worker screening measures, (1) followed best practices of a comprehensive cost estimate; and (2) assessed the feasibility of implementing such measures.

To address the first objective, we reviewed TSA documentation on the methods, data, and assumptions TSA used to develop the cost estimate in its study. We reviewed these methods and how they addressed the

⁴Pub. L. No. 115-254, §§1933 (a), (b) and (c), 132 Stat. 3186, 3572. Although the Act did not define "statistically significant," TSA reported that it based its estimate on the total population of airports and a desired confidence level. For its study, TSA chose a confidence level of 95 percent, and hence, 333 of 419 airports with year-round operations, or 79.5 percent, were included in the cost estimate.

⁵The Act includes a list of screening measures and technologies and asks TSA to include some or all of these measures in its cost estimate: a secure door with card or Personal Identification Number (PIN) entry or biometric technology; surveillance video; advanced screening technologies, such as magnetometer, explosives detection canine, explosives trace detection, advanced imaging technology, X-ray bag screening technology; and the Advanced Threat Local Allocation Strategy (ATLAS). ATLAS generates a randomized schedule and location of procedures to physically screen airport workers entering security-restricted areas of an airport. Pub. L. No. 115-254, Sec. 1933(b)(3), 132 Stat. 3186, 3572.

⁶Transportation Security Administration, *Airport Worker Access Controls Cost and Feasibility Study Fiscal Year 2020 Report to Congress*, (September 30, 2020). Throughout the remainder of the report, we will refer to airport worker inspection measures as screening measures.

⁷Pub. L. No. 115-254, §1933 (d), 132 Stat. 3186, 3572.

statutory requirements in the TSA Modernization Act and evaluated these methods against the best practices from our *Cost Estimating and Assessment Guide*, focusing on the best practices of a comprehensive cost estimate—one of the four characteristics of a high-quality, reliable estimate.⁸ The comprehensive characteristic has four associated best practices that state cost estimates (1) include all life cycle costs, from inception through design, development, production, operations and maintenance, and disposal; (2) are based on a technical baseline which completely defines the program, reflects the current schedule, and is technically reasonable; (3) be based on a work breakdown structure that is product-oriented, traceable to the statement of work, and at an appropriate level of detail to ensure that cost elements are neither omitted nor double-counted; and (4) document all cost-influencing ground rules and assumptions. Of the four characteristics, we selected the “comprehensive” characteristic as the focus of our assessment because it is a foundational characteristic of a cost estimate. If a cost estimate is not comprehensive—that is, not complete—then it cannot fully meet the other best practice characteristics. For each best practice of a comprehensive estimate, we evaluated whether TSA did not meet, minimally met, partially met, substantially met, or fully met the best practice.⁹ We consider a score of not met, minimally met, or partially met to indicate that the agency has weaknesses that need to be addressed in that best practice, and we consider a score of substantially met or fully met to indicate that the agency has largely satisfied that best practice.

In addition, we interviewed TSA officials on the methods and processes they used to develop the study. We also interviewed members of the Aviation Security Advisory Committee (ASAC) whom TSA consulted, as required under the Act, to help scope the study, identify cost elements,

⁸GAO, *Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Program Costs*, [GAO-20-195G](#) (Washington, D.C.: March 2020). Our cost estimating guide identifies four characteristics of a reliable cost estimate: it is (1) comprehensive; (2) well-documented; (3) accurate; and (4) credible.

⁹Our assessment of the methods used to develop cost estimates assesses whether the estimators have fully met, substantially met, partially met, minimally met, or not met each criterion. These are defined as follows: Fully Met – the estimators provided complete evidence that satisfies the entire criterion; Substantially Met – the estimators provided evidence that satisfies a large portion of the criterion; Partially Met – the estimators provided evidence that satisfies about half of the criterion; Minimally Met – the estimators provided evidence that satisfies a small portion of the criterion; and Not Met – the estimators provided no evidence that satisfies any of the criterion.

and review the draft study.¹⁰ Further, we interviewed two airport operators to obtain their perspectives on the study. We selected airports that had an existing enhanced airport worker screening program and represented different geographic regions. Information we obtained from these airport operators is not generalizable to all airports but provided insights on TSA's study from airport operators with existing airport worker screening programs.

To address our second objective, we compared the contents of TSA's study with the provisions in the Act. For additional context, we also reviewed other federal agency guidance on conducting feasibility assessments and a 2019 TSA feasibility assessment to identify characteristics included in those feasibility assessments. We interviewed TSA officials about the method TSA used to assess feasibility, including any underlying data analysis, assumptions, and rationale. The information and communication component of internal controls was significant to this objective, along with its related principle that management should use quality information to achieve its objectives. We assessed the extent to which TSA's feasibility assessment reflected this standard.

We conducted this performance audit from October 2020 to February 2021 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Airport Security Roles and Responsibilities

As the federal agency with primary responsibility for civil aviation security within the U.S., TSA promulgates security requirements, primarily through regulations but also through security directives and other mechanisms. TSA conducts inspections to ensure that airport operators, air carriers,

¹⁰Established in 1989 in the aftermath of a terrorist attack on Pan Am flight 103—commonly referred to as the “Lockerbie bombing”—ASAC provides advice to the TSA Administrator on aviation security matters, including the development, refinement, and implementation of policies, programs, rulemaking, and security directives. Committee members represent stakeholder groups affected by aviation security requirements. The Aviation Security Stakeholder Participation Act of 2014, enacted in December 2014, established the ASAC in statute. Pub. L. 113–238, § 2(a), 128 Stat. 2842. See 49 U.S.C. § 44946.

and other regulated entities comply with these requirements, among other efforts.¹¹

Airport operators, air carriers, and other regulated entities are responsible for implementing security requirements, primarily in accordance with their TSA-approved security programs.¹² These programs generally cover day-to-day operations, including measures that contribute to mitigating insider threats.¹³ The security measures that airport operators and air carriers implement are generally carried out within, or to prevent unauthorized access to, security-restricted areas of an airport or aircraft.

Overview of Airport Worker Screening and Access Controls

TSA classifies the nation's approximately 420 TSA-regulated airports with year-round operations into one of five categories (X, I, II, III, and IV) based on various factors, such as the number of take-offs and landings annually, the extent of passenger screening at the airport, and other security considerations. In general, category X airports have the highest number of passenger enplanements and category IV airports have the fewest.

¹¹See Pub. L. No. 107-71, 115 Stat. 597 (2001); 49 U.S.C. § 114(d). See also, e.g., 49 C.F.R. §§ 1542.5 (TSA airport inspection authority), 1544.3 (TSA domestic air carrier inspection authority), and 1546.3 (TSA foreign air carrier inspection authority). When TSA determines that additional security measures—beyond what are required of regulated entities to implement in existing regulations—are necessary to respond to a specific threat assessment or to a specific threat against civil aviation, TSA may issue security directives (or emergency amendments, in the case of foreign air carriers) that set forth mandatory measures. See, e.g., 49 C.F.R. §§ 1542.303(a), 1544.305, 1546.105(d).

¹²For the purposes of this report, we use the term “air carriers” to include both aircraft operators (i.e., U.S.-based air carriers) operating in accordance with 49 C.F.R. part 1544, and foreign air carriers operating in accordance with 49 C.F.R. part 1546. For the purposes of this report, a “TSA-regulated airport” is an airport in the U.S. operating under a TSA-approved security program in accordance with 49 C.F.R. part 1542 and that, in general, regularly serves air carriers with scheduled passenger operations (also referred to as “commercial” airports). Most TSA-regulated airports discussed in this report, which, in general, are those regularly serving air carriers with scheduled passenger operations in accordance with 49 C.F.R. parts 1544 and 1546, operate under “complete” security programs, which contain the most comprehensive security measures. See 49 C.F.R. § 1542.103(a).

¹³See, generally, 49 C.F.R. ch. XII, subch. C, 49 C.F.R. §§ 1540-1562. In general, TSA-approved security programs describe the policies, procedures, and systems the airport operators, air carriers, and other regulated entities implement to comply with TSA requirements. For purposes of this report, we use the term “TSA-approved” to include the security programs of foreign air carriers, but recognize that TSA regulations provide that the security programs for foreign air carriers must be deemed acceptable by TSA. See 49 C.F.R. § 1546.103.

Category X, I, II, and III airports are required to implement measures to control access and prevent unauthorized entry to security-restricted areas of the airport. Airports choose their specific access control system and technology, such as cipher or keyed locks, proximity swipe cards, Personal Identification Number (PIN) readers, or biometric (e.g., fingerprint) authentication, provided such technology meets the standards of their TSA-approved security program. Category IV airports—which are typically the smallest TSA-regulated airports—are generally not required to identify security-restricted areas within their security programs and thus may not have mechanisms in place to control access to such areas.¹⁴ However, like the larger TSA-regulated airports, security programs for category IV airports must provide for adequate law enforcement support, and these airport operators may choose to implement access control technologies or other measures at their discretion and incorporate those measures into their security programs.

Since 2018, TSA has conducted random physical screening of airport workers at many (mostly large) airports through its Advanced Threat Local Allocation Strategy (ATLAS) program, which expanded to all TSA-regulated airports in 2020.¹⁵ The ATLAS tool generates a randomized schedule and location of procedures to physically screen airport workers entering or within security-restricted areas of an airport. These can include pat-down searches, and screening property, such as by testing for traces of explosives on workers' property. In addition to TSA's random

¹⁴Category IV airports generally adopt and implement “supporting” or “partial” security programs that contain fewer requirements. See 49 C.F.R. § 1542.103(b), (c). According to TSA officials, airports classified by TSA as categories X, I, II, and III must operate under complete security programs, with some category IV airports operating under complete or enhanced supporting security programs as well. According to TSA, an enhanced supporting program, which is implemented by some category IV airports, includes some but not all elements of a complete security program beyond what is required of the supporting security program.

¹⁵Prior to the ATLAS program, TSA conducted physical screening of airport workers starting in 2007 under the predecessor programs, Playbook and Aviation Direct Access Screening Program.

screening using ATLAS, TSA also requires airport operators to perform random screening of airport workers prior to entry into sterile areas.¹⁶

At some airports, operators have chosen to implement airport worker screening programs that require nearly all airport workers, excluding law enforcement and first responders, to be physically screened prior to entering security-restricted areas. TSA and ASAC, among others, have previously reviewed and analyzed airport worker screening programs in several studies and reports, starting in 2008 with a pilot of airport worker screening procedures requested by Congress.¹⁷ In these studies, authors have consistently concluded that there are more effective, more operationally feasible, and less costly methods of securing security-restricted areas than requiring screening of all or nearly all airport workers upon each entry.¹⁸ According to TSA, random and unpredictable screening measures, in conjunction with other layers of security, including enhanced vetting of airport workers, provides a commensurate level of risk mitigation and a more cost effective alternative to 100 percent worker screening.

The International Civil Aviation Organization (ICAO), which formulates and adopts Standards and Recommended Practices for international civil aviation, has a Standard that directs all contracting states to ensure that all non-passengers and their property are subject to screening prior to

¹⁶Sterile areas are security-restricted areas that, in general, provide passengers access to boarding aircraft and to which access is controlled through the screening of passengers and property. Workers who only require access to the sterile area, such as concessionaires, must pass through the TSA passenger screening checkpoint if their access media credentials do not permit them access through other entry points to the sterile area.

¹⁷This pilot was requested by Congress in the Senate Committee on Appropriations report that accompanied the Consolidated Appropriations Act of 2008. See S. Rep. No. 110-84, at 55 (2007).

¹⁸Aviation Security Advisory Committee, *Interim Report on Aviation Insider Threats*, December 7, 2018. Transportation Security Administration, *The Insider Threat: Aviation Worker Access Control and Screening*, April 2015. Aviation Security Advisory Committee, *Final Report of the Aviation Security Advisory Committee's Working Group on Airport Access Control*, April 8, 2015. Homeland Security Institute, *TSA Airport Employee Screening Pilot Program Final Report*, December 2008. Consolidated Appropriations Act, 2008, Pub. L. No. 110-161, 121 Stat. 1844 (2007).

entry into airport security-restricted areas.¹⁹ In March 2020, ICAO published a revised Standard that requires that all such individuals are screened.²⁰ In June 2020, TSA filed an official difference to the revised Standard, wherein they notified ICAO that the multiple layers of security measures used in the U.S. achieve the same intended outcome of the Standard.²¹

TSA's Airport Worker Enhanced Screening Study Methodology and Findings

As required by the Act, TSA submitted a study to Congress in September 2020 that assessed the cost and feasibility of implementing enhanced airport worker screening measures at a statistically significant number of TSA-regulated airports where all workers must be screened at access points to security-restricted areas.

Regarding cost, in its study, TSA estimated that implementing enhanced security measures would have an initial implementation cost between \$2.9 billion and \$3.6 billion and ongoing annual costs between \$2.5 billion and \$3.1 billion. TSA estimated costs for four scenarios. In the first, TSA would provide screening officers at a statistically significant sample of 333 airports. In the second, third-party entities would provide screening

¹⁹The Convention on International Civil Aviation (also known as Chicago Convention), was signed on 7 December 1944 by 52 States and established the International Civil Aviation Organization (ICAO) on 4 April 1947 (15 U.N.T.S. 295). In October of the same year, ICAO became a specialized agency of the United Nations linked to Economic and Social Council. It formulates and adopts Standards and Recommended Practices for international civil aviation security as part of its Annex 17.

²⁰SL AS 8/2.1-19/85 Confidential "Adoption of Amendment 17 to Annex 17" dated 16 December 2019. Standard 4.2.5 currently states, "Each Contracting State shall establish measures to ensure that persons other than passengers, together with items carried, are screened prior to entry into airport security restricted areas," and Standard 4.2.6 currently states, "Each Contracting State shall ensure the use of appropriate screening methods that are capable of detecting the presence of explosives and explosive devices carried by persons other than passengers on their persons or in their items carried. Where these methods are not applied continuously, they shall be used in an unpredictable manner."

²¹Transportation Security Administration, *Letter to the Secretary General of the International Civil Aviation Organization*, (March 2020). Although ICAO standards are not binding, member states are expected to collaborate in securing the highest practicable degree of uniformity in air navigation matters. If member states adopt regulations or practices that differ from international standards, they must notify ICAO, and ICAO then notifies other member states. Those states may impose additional security measures on flights from the state with the difference. According to TSA, to date, no state has imposed any additional measures on flights from the U.S. as a result of filing a difference to Standard 4.2.6 of Annex 17. ICAO also conducts periodic state audits, and if they find a member state is not ensuring minimum security requirements set forth in Annex 17 (called a "significant security concern"), they may direct the state to mitigate the deficiency within 15 calendar days, or the existence of a deficiency will be communicated to other member states.

officers at private industry rates at those same airports. In the third and fourth, they estimated costs for TSA screening officers and third-party screening officers, respectively, at all 419 TSA-regulated airports with year-round operations. TSA's cost estimate included the following cost elements:





- physical screening checkpoints with screening lanes that include a walk-through metal detector, explosives trace detection machine, bottle liquid scanner, and an X-ray machine for personal bags;
- real estate for space needed for the worker screening lanes;
- screening personnel, including compensation, benefits, and training;
- a surveillance camera and badge reader at select access points;
- Explosives Detection Canine teams; and
- the opportunity cost of airport workers waiting at the checkpoint.




Regarding feasibility, TSA concluded in its study that it would be feasible to implement enhanced airport worker screening measures, which we discuss in more detail later in the report.

TSA Followed Most Best Practices for a Comprehensive Cost Estimate in Its 2020 Study

TSA followed many of the best practices associated with a comprehensive cost estimate, such as including relevant cost elements and documenting assumptions, in its 2020 study. However, TSA did not fully follow the best practice of using a standard work breakdown structure. Our cost estimating guide outlines four best practices associated with developing a comprehensive cost estimate (see figure 1 for a description of these). The cost estimating guide was developed to establish a consistent methodology based on best practices that can be used across the federal government for developing, managing, and evaluating program cost estimates. As described earlier, one of the four characteristics of a high quality, reliable cost estimate is that it is comprehensive. We consider a score of partially met to indicate that the agency has weaknesses that need to be addressed in that best practice, and a score of substantially met or fully met indicates that the agency has largely satisfied the best practice.

Figure 1. Evaluation of Transportation Security Administration’s (TSA) Steps to Estimate the Cost of Airport Worker Screening Measures in its 2020 Study Against Best Practices of a Comprehensive Cost Estimate

| Comprehensive cost estimate best practices | GAO score ^a | Cost estimate strengths | Cost estimate limitations |
|--|---|--|--|
| Contains all life cycle costs |  | TSA’s estimates include many governmental and contractor cost elements that cover several years of program operation, and documents why some elements were excluded. | TSA’s estimates did not account for some costs, such as infrastructure changes, that could arise from variability across airports and potentially be large. |
| Includes a technical baseline ^b |  | Technical information, such as maintenance costs for screening equipment and hiring and training costs related to turnover, is stated in the report and cost model. | The information is not stored in one easily accessible location. |
| Includes a work breakdown structure ^c |  | TSA built its cost estimate using a model spreadsheet that lays out the sub-parts of each cost element in the final model, as well as the discrete categories of costs. This cost estimating structure is consistent across the scenarios estimated. | TSA did not use a standard work breakdown structure, which allows for collecting and sharing data among programs, nor did they produce a work breakdown structure dictionary for this study, to define what is included in each element and how it relates to others in the hierarchy. |
| Documents all ground rules and assumptions |  | TSA has documented assumptions that were developed with subject matter experts and conducted sensitivity analyses on them and there is documentation of the rationale and historical data behind all the assumptions. | None identified. |

 Fully met
  Substantially met
  Partially met

Source: GAO presentation of Transportation Security Administration (TSA) information. | GAO-21-273

^aPartially Met – TSA provided evidence that satisfies about half of the criterion; Substantially Met – TSA provided evidence that satisfies a large portion of the criterion; and Fully Met – TSA provided complete evidence that satisfies the entire criterion. We consider a score of “Substantially Met” or “Fully Met” as an indicator that the agency largely satisfied the best practice.

^bThe technical baseline should document the underlying technical and program assumptions necessary to develop a cost estimate. It can be a single document or several documents stored in one location. The technical baseline completely defines the program, reflects the current schedule, and is technically reasonable.

^cA work breakdown structure deconstructs a program’s end product into smaller specific elements. Standardizing the work breakdown structure results in more consistent cost estimates, and allows data to be shared across organizations. A work breakdown structure should be accompanied by a dictionary that describes each of the various elements and how it relates to others in the hierarchy. A work breakdown structure is a document that is product-oriented, traceable to the statement of work, and at an appropriate level of detail to ensure that cost elements are neither omitted nor double-counted.

Our analysis indicates that TSA followed most of the best practices of a comprehensive estimate in its 2020 study. Specifically, TSA's cost estimate (1) included many of the relevant government and contractor costs; (2) discussed technical information about hiring, training, and maintenance; and (3) documented the assumptions upon which its estimates depend. However, TSA did not include a standard work breakdown structure or an associated dictionary for this study. A work breakdown structure is an essential part of developing a program's cost estimate and enhancing an agency's ability to collect data necessary to support future cost estimates, according to our cost estimating guide. Standardizing the work breakdown structure is considered a best practice because it enables an organization to collect and share data among programs. TSA also did not produce a separate work breakdown structure dictionary that consolidates the study's definitions of what is included in each element of the cost estimate and how each element relates to others.²² Such a dictionary helps ensure that cost elements are neither omitted nor double-counted. In TSA's study, for example, without a standard work breakdown structure and dictionary, it was unclear if TSA's estimates included some common work elements, such as program management.

TSA officials responsible for developing the cost estimate said that they were unaware of our cost estimating guide. They noted that they developed their cost estimate using general principles from the Office of Management and Budget (OMB) guidance on conducting regulatory impact analysis.²³ TSA officials stated that they used OMB's *Regulatory Impact Analysis* principles because enhanced airport worker screening was a conceptual rather than established program.

While OMB's *Regulatory Impact Analysis* guidance was developed for estimating regulatory impacts, it does not reflect all the best practices for cost estimating. OMB has separate guidance for cost estimating. In this other guidance, OMB recommends following our cost estimating guide, and states that following it will help agencies meet most cost estimating

²²Although "full worker screening" is not an established program at TSA, the individual screening measures that TSA estimated the costs of (e.g., canine teams, screening lanes, closed-circuit television, access control technologies) are currently deployed in the field and could have their own individual work breakdown structures.

²³Office of Management and Budget, *Regulatory Analysis*, OMB Circular A-4 (September 2003). The goal of *Regulatory Impact Analysis* is to inform agency decisions in advance of regulatory actions and to ensure that regulatory choices are made after appropriate consideration of the likely consequences.

requirements, whether for established or conceptual programs.²⁴ Applying best practices from our cost estimating guide does not preclude the use of other approaches, such as the *Regulatory Impact Analysis* used by TSA, and can be used in conjunction to strengthen or supplement them.

TSA continues to develop cost estimates for other aviation security purposes. For example, the TSA Modernization Act contained provisions for TSA to assess the costs of other potential aviation security enhancements and programs. TSA officials said that our cost estimating guide could be helpful to consider when developing future cost estimates. Issuing guidance ensuring TSA staff consider more fully following best practices in our cost estimating guide, such as those from the comprehensive characteristic, will better position TSA to develop future cost estimates that are of high quality and reliable.

TSA's Feasibility Assessment Used Incomplete Information

TSA's study concluded that enhanced airport worker screening measures would be feasible to implement at a statistically significant number of airports.²⁵ However, TSA used incomplete information to assess the feasibility of implementing worker screening nationwide. For example, TSA did not assess local airport constraints that could influence implementation.

Standards for Internal Control in the Federal Government highlight the importance of using relevant data that has a logical connection with or bearing upon agency activities to help achieve its objectives.²⁶ Management should then process that data into quality information that is appropriate, current, complete, accurate, accessible, and timely to make informed decisions. In TSA's case, such information could include relevant factors and constraints that have practical effects on the

²⁴Office of Management and Budget, *Preparation, Submission, and Execution of the Budget*, OMB Circular A-11, Appendix 8 (revised July 2020). This guidance says that cost estimates are developed for various purposes and at different phases of a program's life cycle. For example, it says that early emphasis on cost estimates, including conceptual cost estimates developed during the planning phase, is critical to successful management of a program.

²⁵Although the Act did not define "statistically significant," TSA reported that it based its estimate on the total population of airports and a desired confidence level. For its study, TSA chose a confidence level of 95 percent, and hence, 333 of 419 airports with year-round operations, or 79.5 percent, were included in the cost estimate.

²⁶Government Accountability Office, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

feasibility of implementing policy, procedural, or technological changes at the local level.

TSA's assessment did not use complete information. Specifically, (1) TSA did not consider information about the relevant factors, such as airport constraints, that influence feasibility, and (2) TSA did not consider whether the lessons learned from existing worker screening programs were applicable to small and medium airports, including categories I, II, III, and IV.

- **Airport Constraints.** TSA identified a number of constraints that could affect the feasibility of implementing worker screening measures, but did not consider these in its assessment. For example, some airports may not have unused real estate available to house technology for worker screening; others may have limits on the weight of screening equipment they are able to install. Instead, TSA assessed whether these measures were "possible in an unconstrained environment." TSA officials said that the agency overcame barriers and constraints to establish TSA as a federal organization in 2002. Officials said that they believed they could similarly overcome constraints to implementing worker screening measures at TSA-regulated airports. However, in its study, TSA stated that to accurately determine the extent to which enhanced worker screening measures are truly feasible to implement, the agency would need to collect data from and conduct analysis on local constraints at all airports.
- **Airport Size.** TSA based its assessment on information from category X airports, which are typically the largest and busiest, and did not fully consider the applicability of these experiences and lessons learned to smaller airports. Specifically, TSA's feasibility assessment relied on the conclusions of previously published industry and federal government studies on the feasibility of enhanced airport worker screening programs, and information from a number of airport operators that have implemented such programs. However, all of the airports TSA listed as contributors to its 2020 study and the airports included in the previously-published studies were category X

airports.²⁷ Lessons learned from large airports' experience implementing airport worker screening programs may not provide appropriate criteria for the practicality and scalability of implementing airport worker screening at small and medium sized airports, since these may have different sets of circumstances and constraints that influence their ability to implement worker screening. For example, two ASAC officials said that workers at smaller airports may need to cross in and out of security-restricted areas many times throughout their workday, making it impractical to screen upon each entry and reentry.

According to TSA officials, they did not incorporate this information because they believed their assessment was sufficient. However, in past feasibility assessments, TSA has included more complete information that incorporated issues related to local airport constraints. For example, in November 2019, TSA produced a feasibility assessment on the potential use of computed tomography to inspect air cargo on passenger planes. In the computed tomography assessment, TSA provided detailed discussions of the possible prevalence and severity of local airport factors that could influence the feasibility of using computed tomography. TSA also provided a discussion of the ideal circumstances under which using such technology could be used, and did so without collecting data from every airport that processes air cargo.²⁸

TSA's inconsistency could be, in part, because the agency does not have formal guidance for staff to follow. Other federal agencies conduct feasibility assessments, and they provide templates or guidance for staff or officials to follow when designing and carrying them out, which could help ensure their assessments are consistent and based on complete information. In one example, Department of Health and Human Services feasibility study guidance suggests that officials should take a project's relevant factors into account to ascertain whether a proposed project is

²⁷According to TSA officials, their feasibility conclusion was also informed by a 2008 study conducted by the Homeland Security Institute for TSA where they assessed an airport worker screening pilot program. The pilot included three airports that implemented 100 percent worker screening, with one airport each from category X, I, and III. However, this study did not specifically address the feasibility of implementing airport worker screening. (Homeland Security Institute, TSA Airport Employee Screening Pilot Program, December 2008). Further, TSA officials also stated that as part of their 2020 study they collected information from approximately 290 airports, across all airport categories, to help develop their cost estimate and assess the level of worker screening carried out at the airport. Officials noted that this collection of information helped inform their feasibility conclusion.

²⁸Transportation Security Administration, *Computed Tomography Feasibility Study: Screening of Air Cargo Transported on Passenger Aircraft*, (November 2019).

technically, financially, and operationally viable. In another example, guidance based on work supported by the National Institutes for Health proposes that feasibility assessments include discussions of dimensions of feasibility—e.g. practicality, scalability, and integration—of a particular policy or programmatic change, given the unique factors of a new environment. During the course of our review, TSA officials indicated that such guidance could be useful for future feasibility assessments. Issuing guidance on feasibility assessments could help TSA ensure that it consistently incorporates and bases its conclusions upon complete information.

Conclusions

The aviation industry faces a consistent threat posed by workers and other insiders who have used their access privileges and knowledge to commit criminal acts, such as drug smuggling, gun smuggling, theft, and attempted suicide bombing. TSA estimated that implementing enhanced airport worker screening measures to help mitigate these threats would cost billions of dollars. TSA followed many but not all of the best practices for comprehensively estimating costs in its 2020 study, and officials acknowledged that following our cost estimating guide could be helpful when developing future estimates. Issuing guidance ensuring TSA staff consider following best practices in our cost estimating guide, such as those from the comprehensive characteristic, will better position TSA to develop future estimates are comprehensive, high quality, and reliable for purposes of informing policy decisions by TSA, as well as by Congress.

TSA also concluded that, in an unconstrained environment, it would be possible to implement enhanced worker screening; however, TSA's assessment lacked complete information necessary to ensure its assessment was of high quality. For example, TSA noted various constraints that would impact implementation but did not include an analysis of the impacts of these constraints. Moreover, TSA did not consider the extent to which the information it did use was applicable across all airports. TSA officials said the agency has no formal guidance on conducting feasibility assessments for staff to follow. Issuing guidance could help ensure the agency's feasibility assessments consistently incorporate and base its conclusions on complete information.

Recommendations for Executive Action

We are making the following two recommendations to TSA:

The TSA Administrator should issue guidance ensuring that TSA staff consider following best practices in GAO's cost estimating guide when developing approaches for future cost estimates. (Recommendation 1)

The TSA Administrator should issue guidance to help ensure that the agency consistently incorporates complete information in its future feasibility assessments. (Recommendation 2)

Agency Comments and Our Evaluation

We provided a draft of this product to the Department of Homeland Security (DHS) for comment. In its comments, reproduced in appendix II, DHS concurred with our two recommendations and described steps it plans to take to implement them, including an estimated time frame for completion. DHS also provided technical comments, which we incorporated as appropriate.

In response to our recommendations, DHS's letter notes that TSA plans to develop and disseminate guidance for relevant TSA offices to consider following our cost estimating guide when developing cost estimates for established transportation security programs. While we are encouraged by this step, as noted above, our cost estimating guide can apply to cost estimates for both conceptual and established programs. The letter also states that TSA plans to issue guidance to help ensure the agency consistently incorporates complete information in its future feasibility assessments. TSA will develop this guidance by researching best practices and identifying essential elements of a complete feasibility assessment. If fully implemented, these actions should address the intent of the recommendation.

We are sending copies of this report to the appropriate congressional committees and the Secretary of Homeland Security. In addition, the report is available at no charge on the GAO website <https://www.gao.gov>.

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



Triana McNeil
Director, Homeland Security and Justice

List of Committees

The Honorable Maria Cantwell
Chair
The Honorable Roger F. Wicker
Ranking Member
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable Gary C. Peters
Chairman
The Honorable Rob Portman
Ranking Member
Committee on Homeland Security and Governmental Affairs
United States Senate

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

Appendix I: Additional Information on the Transportation Security Administration Cost and Feasibility Study on Enhanced Airport Worker Screening Measures

In addition to requiring that the Transportation Security Administration (TSA) produce a study examining the cost and feasibility of implementing enhanced airport worker screening measures, the 2018 TSA Modernization Act (Act) included provisions for TSA to include other information in its study.¹ The Act asked TSA, to the extent practicable, to:

- assess the operational efficiency and security effectiveness of enhanced airport worker screening measures, including airport worker screening, using the measures and technologies described in the Act;²
- compare the estimated cost and security effectiveness of the screening measures and technologies listed in the Act; and
- assess the costs associated with establishing the minimum number of employee entry and exit points—access points—to security-restricted areas of the airport that are necessary for operations.

The following describes how TSA addressed the additional information it was asked to include in the study, based on our review of the study and discussions with TSA officials.

Assessing the Operational Efficiency and Security Effectiveness of Screening Measures and Technologies Described in the Act

- TSA provided a high level, aggregate assessment of the operational efficiency and security effectiveness of the enhanced airport worker screening measures, described in the Act.
- According to TSA officials, the screening measures and technologies included in the study's cost estimate are all currently in use at TSA-regulated airports and passenger screening checkpoints, and their effectiveness has already been proven through TSA's experience at such screening checkpoints.
- Regarding the operational efficiency of these screening measures, TSA said in its study that TSA's current risk-based, layered security system is more operationally efficient than the 100 percent airport worker screening described in the Act because it is more effective,

¹Transportation Security Administration, *Airport Worker Access Controls Cost and Feasibility Study Fiscal Year 2020 Report to Congress*, (September 30, 2020).

²The Act asked TSA to include the following security measures and technologies in its cost estimate: a secure door with card or PIN entry or biometric technology; surveillance video; magnetometer; explosives detection canine; explosives trace detection; advanced imaging technology; X-ray bag screening technology; and TSA's Advanced Threat Local Allocation Strategy (commonly known as ATLAS). Pub. L. No. 115-254, Sec. 1933 (b), 132 Stat. 3186, 3572.

more operationally feasible, and less costly.³ TSA officials told us they based this assessment on their knowledge of aviation security as well as historical studies by TSA, Department of Homeland Security Office of Inspector General, and the Aviation Security Advisory Committee (ASAC), among others, which have examined 100 percent and full airport worker screening over the past decade.⁴

Comparing the Cost and Security Effectiveness of Screening Measures and Technologies Described in the Act

- TSA assessed and provided the costs for most of the screening measures and technologies listed in the Act, but the study did not include a comparison of the costs of the screening measures and technologies.
- TSA officials said that in the study they did not assess the security effectiveness of each screening measure and technology because the effectiveness of all these measures has already been proven. Additionally, most airport operators and air carriers already employ and are required to use some of the access control technologies described in the Act, such as surveillance video and secure doors.

Assessing the Cost of Reducing Access Points to the Operational Minimum

- TSA did not include an assessment of the cost to reduce access points to the operational minimum in the study.
- TSA officials told us that airport operators are already required under their airport security programs to maintain access points to security-restricted areas of an airport to an operational minimum. TSA inspectors are to conduct local oversight to ensure compliance with this requirement, and officials said they have high confidence that the majority of airports work with local TSA officials, as required, to maintain the minimum number of access points operationally feasible.
- According to TSA officials, although further incremental access point reductions are possible over time, such changes would be difficult to quantify because of limitations in available data, such as the constantly changing number of access points at airports resulting from airport construction projects.

³TSA's layered security system includes vetting against terrorism watch lists; regular and frequent background checks; random and unpredictable physical screening (both upon entry to and throughout security-restricted areas), among other things.

⁴ASAC provides advice to the TSA Administrator on aviation security matters, including the development, refinement, and implementation of policies, programs, rulemaking, and security directives. Committee members represent stakeholder groups affected by aviation security requirements. Full worker screening or 100 percent worker screening, if no workers are exempt from screening, are airport worker screening programs that require all or nearly all airport workers (with some exceptions, such as law enforcement and first responders) to be physically screened prior to entering security-restricted areas.

Appendix II: Comments from the Department of Homeland Security

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



**Homeland
Security**

February 12, 2021

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

Re: Management Response to Draft Report GAO-21-273, "AIRPORT WORKER SCREENING: TSA Could Further Strengthen its Approach for Estimating Costs and Feasibility of Security Measures"

Dear Ms. McNeil:

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

The Department is pleased to note GAO's recognition that the Transportation Security Administration (TSA) followed most of the best practices for a comprehensive cost estimate in the September 30, 2020, "Airport Worker Access Controls Cost and Feasibility Study Fiscal Year 2020 Report to Congress." DHS remains committed to providing relevant, accurate, and comprehensive reporting to Congress.

The draft report contained two recommendations with which the Department concurs. Attached find our detailed response to each recommendation. DHS previously submitted technical comments addressing several accuracies, contextual, and other issues under a separate cover for GAO's consideration.

**Appendix II: Comments from the Department
of Homeland Security**

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

Sincerely,

**JIM H
CRUMPACKER**

Digitally signed by JIM H
CRUMPACKER
Date: 2021.02.12 12:29:22
-05'00'

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

Attachment

**Attachment: Management Response to Recommendations
Contained in GAO-21-273**

GAO recommended that the TSA Administrator:

Recommendation 1: Issue guidance ensuring that TSA staff consider GAO's cost estimating guide when developing approaches for future cost estimates.

Response: Concur. TSA's Policy, Plans, and Engagement (PPE) will coordinate the development and dissemination of guidance requiring that TSA offices involved in cost estimation activities consider GAO's cost estimating guide when developing approaches for estimating the cost of established transportation security programs.

Estimated Completion Date: February 28, 2022.

Recommendation 2: Issue guidance to help ensure that the agency consistently incorporates complete information in its future feasibility assessments.

Response: Concur. TSA PPE will: 1) coordinate the research of industry and federal agency best practices; 2) identify essential elements of complete feasibility assessments; and 3) require those elements to be incorporated in formal transportation security feasibility assessments.

Estimated Completion Date: February 28, 2022.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Triana McNeil at (202) 512-8777 or McNeilT@gao.gov

Staff Acknowledgments

In addition to the contact named above, Kevin Heinz (Assistant Director), Winchee Lin (Analyst in Charge), Sarah Williamson, Lilia Chaidez, Benjamin Crossley, Jennifer Echard, David Hooper, Susan Hsu, Jennifer Leotta, and Amanda Miller made key contributions to this report.

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