PARAS PROGRAM FOR APPLIED RESEARCH IN AIRPORT SECURITY

PARAS 0019 March 2020

Employee/Vendor Physical Inspection Program Guidance

National Safe Skies Alliance, Inc.

Sponsored by the Federal Aviation Administration

Gloria Bender
TransSolutions, LLC
Fort Worth, TX

NOTICE

The project that is the subject of this report was a part of the Program for Applied Research in Airport Security (PARAS), managed by Safe Skies and funded by the FAA.

The members of the technical panel selected to monitor this project and to review this report were chosen for their special competencies and with regard for appropriate balance. The report was reviewed by the technical panel and accepted for publication according to procedures established and overseen by Safe Skies.

The opinions and conclusions expressed or implied in this report are those of the individuals or organizations who performed the research and are not necessarily those of Safe Skies or the FAA.

Safe Skies and the FAA do not endorse products or manufacturers.

NATIONAL SAFE SKIES ALLIANCE, INC.

National Safe Skies Alliance (Safe Skies) is a non-profit organization that works with airports, government, and industry to maintain a safe and effective aviation security system. Safe Skies' core services focus on helping airport operators make informed decisions about their perimeter and access control security.

Through the ASSIST (Airport Security Systems Integrated Support Testing) Program, Safe Skies conducts independent, impartial evaluations of security equipment, systems, and processes at airports throughout the nation. Individual airports use the results to make informed decisions when deploying security technologies and procedures.

Through PARAS (Program for Applied Research in Airport Security), Safe Skies provides a forum for addressing security problems identified by the aviation industry.

A Board of Directors and an Oversight Committee oversee Safe Skies' policies and activities. The Board of Directors focuses on organizational structure and corporate development; the Oversight Committee approves PARAS projects and sets ASSIST Program priorities.

Funding for our programs is provided by the Federal Aviation Administration.

PROGRAM FOR APPLIED RESEARCH IN AIRPORT SECURITY

The Program for Applied Research in Airport Security (PARAS) is an industry-driven program that develops near-term practical solutions to security problems faced by airport operators. PARAS is managed by Safe Skies, funded by the Federal Aviation Administration, and modeled after the Airport Cooperative Research Program of the Transportation Research Board.

Problem Statements, which are descriptions of security problems or questions for which airports need guidance, form the basis of PARAS projects. Submitted Problem Statements are reviewed once yearly by the Safe Skies Oversight Committee, but can be submitted at any time.

A project panel is formed for each funded Problem Statement. Project panel members are selected by Safe Skies, and generally consist of airport professionals, industry consultants, technology providers, and members of academia—all with knowledge and experience specific to the project topic. The project panel develops a request of proposals based on the Problem Statement, selects a contractor, provides technical guidance and counsel throughout the project, and reviews project deliverables.

The results of PARAS projects are available to the industry at no charge. All deliverables are electronic, and most can be accessed directly at www.sskies.org/paras.

PARAS PROGRAM OFFICER

Jessica Grizzle *Safe Skies PARAS Program Manager*

PARAS 0019 PROJECT PANEL

Caroline Chane *Dallas Fort Worth Internatinoal Airport*
Sarah Demory *Phoneix Sky Harbor International Airport*
Tracy Fuller *ACTS – Aviation Security, Inc.*
Mark Inzana *Denver International Airport*
Melissa Osborn *DOWL*
Lisa Rousseau *Port of Seattle*
Christian Terry *Delta Air Lines*

AUTHOR ACKNOWLEDGMENTS

The Research Team would like to acknowledge the nearly 60 airports, vendors, and concessionaires who took time out of their busy schedules to help make this Guidebook robust and useful to airports of all sizes. We would especially like to thank the dozen airports who hosted us and allowed us to observe their operations on site. It is only through the support of airports that Safe Skies is able to continue to provide the aviation industry with valuable research on practical airport-related topics. Finally, the Research Team wants to thank the Panel of volunteers who lent their expertise and time to ensuring the Guidebook would be useful and applicable.

CONTENTS

TABLES & FIGURES

SUMMARY

It is widely recognized that employees or other persons with a close working knowledge of airports, access to secure areas, and the ability to do harm – whether through intent, accident, or coercion – could use their knowledge to cause significant damage to airports and airlines, both with respect to property and, most importantly, loss of life. The implementation of a robust and flexible physical inspection program plays a critical role in reducing the risks posed by insider threat.

Airports and the TSA have focused on several strategies to reduce the insider threat. They include enhanced and continuous employee vetting, enhanced identity management strategies and technology, and integrating automated access control systems with identity management systems. Additionally, risk-based control strategies may be incorporated to enhance all of these approaches. Robust aviation worker, vendor, vehicle, and merchandise and consumables physical inspection programs play an important role in an integrated insider threat mitigation program.

While a number of airports have implemented various insider threat mitigation programs, there has been no single, well-researched document that allows an airport to identify the range of physical inspection programs available, or to determine what options will best serve their requirements.

This report consolidates the information, recommendations, best practices, and lessons learned from developing and maintaining physical inspection programs that were gathered from dozens of published research documents and interviews from airports of all sizes, layouts, and demand levels. It provides several methods that could help an airport of any size or operation enhance their inspection program(s). The methods presented could be implemented by any airport, but it is ultimately at the airport's discretion whether a method will work for their operations, budget, available resources, and layout.

The authors have written this report with the assumption that all U.S. airports are in compliance with current TSA Airport Security Program (ASP) and Security Directive requirements with regards to access control; inspection of people, property, vehicles, merchandise and consumables; and inspection program training; and the badged population has been properly vetted and are carrying valid identification needed to perform their jobs in the prescribed way.

To facilitate navigation, this report is divided into inspection processes. It can be read from beginning to end or individually by topic, depending on the reader's objectives. Some methods (such as x-ray machines) can be used in multiple processes; these sections will direct the reader to the first reference of this method to avoid duplication in the document.

Section 10 provides a quick summary of all the methods discussed within the report, with page numbers as reference for more details.

With regards to technology, it is important to consider the date of this report's publication. The industry is constantly evolving, including current research and the changing threat environment, with new technology being piloted every year.

Additionally, response to alarms and other triggering events will not be discussed in detail in this report, but should be considered when reviewing and implementing new methods for inspections. In general, inspectors should be trained on what is considered an alarm or a triggering event for each method and technology, and the most appropriate method to respond.

PARAS 0006 *Synthesis – Employee Inspections*, a good reference for airports wishing to see the state of the industry at its publication in February 2017, is available at www.sskies.org/paras/reports/.

PARAS ACRONYMS

ACRP	Airport Cooperative Research Project
AIP	Airport Improvement Program
AOA	Air Operations Area
ARFF	Aircraft Rescue & Firefighting
CCTV	Closed Circuit Television
CEO	Chief Executive Office
CFR	Code of Federal Regulations
COO	Chief Operating Officer
DHS	Department of Homeland Security
DOT	Department of Transportation
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FSD	Federal Security Director
GPS	Global Positioning System
IED	Improvised Explosive Device
IP	Internet Protocol
IT	Information Technology
MOU	Memorandum of Understanding
RFP	Request for Proposals
ROI	Return on Investment
SIDA	Security Identification Display Area
SOP	Standard Operating Procedure
SSI	Sensitive Security Information
TSA	Transportation Security Administration

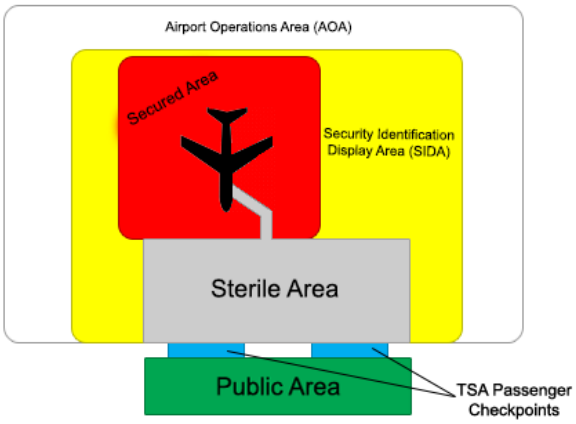
GLOSSARY OF KEY TERMS

Below is a list of terms used throughout the report that often have different meanings in the aviation industry. The definitions are intended to provide a clear meaning for these terms as they are used within the document.

Access Portal: A gateway that allows people, goods, or vehicles to pass between the Public, Secured, and Sterile Areas. This may be a door, gate, barrier, turnstile, or another form.

Air Operations Area (AOA): Used by aircraft and includes aircraft movement areas, aircraft parking areas, loading ramps, and safety areas. An example of an AOA is shown in Figure G-1.

Figure G-1. Airport Security Operations Areas



Aviation Worker: For the purpose of this report, an aviation worker is anyone who has undergone a Criminal History Records Check and/or a Security Threat Assessment to be authorized to work at the airport. This includes people who do not have a SIDA badge but work in the public space and have been appropriately vetted. Examples include airport personnel, tenants (air carrier crew, technicians, ground handlers, gate agents, law enforcement officers [LEO], TSA agents, FAA agents, etc.), concessionaires (restaurant staff, gift shop staff, etc.), badged vendors (wheelchair attendants, delivery drivers, vending machine attendants, etc.), and badged contractors (construction workers, technicians, plumbers, electricians, HVAC [heating, ventilation, and air conditioning], etc.)

Bad Actor: A person with ill intent who has the potential to cause a great deal of harm and/or damage for personal or ideological reasons.

Concessionaire: An entity that has an agreement with the airport or airport tenants to conduct business at the airport (in the Public and/or Sterile Area) and provides a product to customers. This includes employees of restaurants, specialty stores, and kiosks.

Contractor: A person or company who has contracted with the airport, airport concessionaire, or airport tenant to perform specified work. This includes construction workers, HVAC technicians, plumbers, and electricians as well as any other specialized workers.

Insider: Any current or former employee who has, or had, authorized access or knowledge about an airport's exploitable inner workings. Insiders have the potential to turn into bad actors.

Inspection: Although most airports use "inspect" and "screen" interchangeably, the TSA does not. In 71 FR 30477, TSA defined screening as "the systematic evaluation of a person or property to assess whether either pose a threat to security" (2006) and inspection is one part of that evaluation. For the purpose of this document, "inspect" will be used to describe any activity in which an inspector or equipment visually or physically searches for prohibited items on people, goods, and vehicles, except in the case of federal regulations and TSA guidance, which will be quoted as published.

Merchandise and Consumables: Any item intended for sale, consumption, or use by customers at retail stores, restaurants, clubs, lounges, and other concessionaires.

Public Area: Areas where access control or inspections are not required including parking facilities, airline ticketing, and baggage claim.

Secured Area: Mapped to individual airports in their ASP – area where aircraft operators and their contractors enplane and deplane passengers, and sort and load baggage.

Security Identification Display Area (SIDA): Mapped to individual airports in their ASP – includes the Secured and Sterile Areas. At some airports this is the same area as the AOA.

Sterile Area: Mapped to individual airports in their ASP – area where individuals have access to boarding aircraft and their property must be screened prior to entering. Often includes boarding gates, restaurants, and concessions.

Tenant: An entity that has an agreement with the airport to conduct business at the airport (in the Public and/or Sterile Areas) and provides a service to customers. For example, air carriers, rental car companies, clubs, etc.

Vendor: An entity that supplies merchandise and consumables sold by airport tenants and concessionaires at the airport.

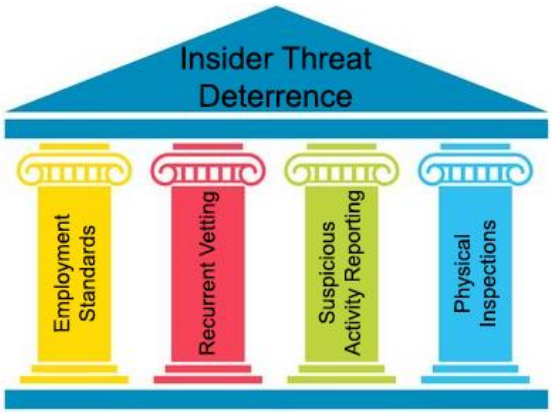
ABBREVIATIONS, ACRONYMS, INITIALISMS, AND SYMBOLS

ASAC	Aviation Security Advisory Committee
ASP	Airport Security Program
ASSIST	Airport Security System Integrated Support Testing
ATLAS	Advanced Threat Local Allocation Strategy
CT	Computed Tomography
EMIS	Electromagnetic Inspection Scanners
ETD	Explosives Trace Detection
HVAC	Heating, Ventilation, and Air Conditioning
INSA	Intelligence and National Security Alliance
LEO	Law Enforcement Officer
MMW	Millimeter Wave
MWAA	Metropolitan Washington Airports Authority
RFI	Request for Information
RFID	Radio Frequency Identification
RFQ	Request for Qualifications

SECTION 1: INTRODUCTION

The Aviation and Transportation Security Act of 2001 required the TSA to enforce "screening or inspection of all individuals, goods, property, vehicles, and other equipment before entry into a secured area of an airport in the United States." Currently, most of this responsibility (other than the inspection of passengers and their property) falls on the airport, and is often included as part of their insider threat deterrence program. However, these insiders become familiar with the security protocols and may have the ability to circumvent them. For this reason, airports need to find agile, multilayered, and comprehensive solutions that work within their individual operations, layout, and resource budget.

Figure 1-1. The Key Pillars of Insider Threat Deterrence



According to Randy Harrison, Vice President of Corporate Security at Delta Air Lines, the key pillars of an insider threat deterrence program include employment standards, recurrent vetting, suspicious activity reporting, and physical inspections (see Figure 1-1). Pillars such as these are necessary to protect against insider threat. A multifaceted approach is critical as no one mitigation measure is infallible.

It is important to realize that physical inspection is only one factor that helps protect airports from insider threat; effective insider threat deterrence requires airports to holistically assess their security posture.

TSA and the International Civil Aviation Organization recommend a risk-based approach to airport security for airports of all sizes. This approach is characterized by five attributes:

1. **Intelligence-driven** – threat and vulnerability assessments are used to make informed decisions regarding security policies, procedures, practices, and posture
2. **Unpredictable** – elements of the security system need to be irregular, unpredictable, flexible, and random to minimize intelligence gathering from potential bad actors
3. **Adaptable** – the system needs to be flexible and adaptable to respond to changing threat environments, new regulations, and new processes including technology
4. **Evolving** – the system needs to continuously incorporate new, effective technologies and procedures introduced into the market
5. **Layered** – sometimes called the "Swiss cheese model," consists of multiple, relatively independent elements which work together to create a coordinated effort and redundancies in the system to close security gaps

The Aviation Security Advisory Committee (ASAC) has concluded that static security measures (e.g., inspections done at the same place at the same time in the same manner) are easier for potential bad actors to study and learn, making them easier to circumvent than dynamic and less predictable security measures. Adding multiple factors and layers to the process has the benefit of increasing security overall and, ideally, decreasing insider threat. Implementing layers of active security tactics and balancing people, processes, and technology is the key to an effective inspection program.

SECTION 2: ACCESS CONTROLS

Under 49 CFR § 1542.207, airports are required to enact certain access control measures that would deny entry to the Sterile and Secured Areas by unauthorized individuals as well as provide ways to sequester individuals to the areas they are authorized to access. The following methods provide solutions to differentiating between aviation workers.

2.1 Total Badging

Badging everyone who works at the airport, regardless of whether that person works in the SIDA or only the Public Area, not only gives the airport the ability to perform background checks, but also the authority to perform random inspections of these people because they have consented as part of their badge application. Pairing this method with the color-coded badge and badge icon methods in the following two sections quickly identifies the aviation worker as a Public Area-only employee, or as a person who needs to be escorted within the Sterile Area.

2.2 Picture Renewal

Requiring all aviation workers to retake an ID picture when their badge is renewed keeps profile pictures from becoming outdated. This helps the inspectors and other aviation workers to accurately identify whether the person wearing the badge is the same as the person in the picture or an imposter using someone else's badge.

2.3 Color Coded Badges

Creating color designations for badge types allows aviation workers and authorities to quickly identify other aviation workers who are authorized to be in certain areas without needing to approach them.

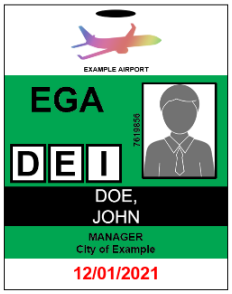
Most airports (especially those with a large population of aviation workers) already use a system such as this, with different colors to represent various access levels, such as Sterile Area or SIDA access, as shown in Figure 2-1. At airports where Public Area aviation workers are also badged, this quickly identifies them within the restricted areas.

Figure 2-1. Badges with Colors Indicating Access

2.4 Obvious and Distinct Icons

Most airport badges already have icons or stickers that identify whether the aviation worker can escort, drive, or access Federal Inspection Services areas, or if the worker has other special permissions such as the authority to inspect. Making these icons large or otherwise obvious, as shown in Figure 2-2, allows other aviation workers to determine if a person is permitted to perform restricted tasks (e.g., escorting or driving) without the need to approach the person.

Figure 2-2. Example Badge with Obvious Icons



2.5 Distinct Uniforms

This method suggests aviation workers have distinct uniforms—whether by color, style, or other means—to enable quick identification of their job function and their authority to be in certain areas.

Of the access control methods described in this chapter, distinct uniforms may be the most difficult to implement because tenants, concessionaires, vendors, and contractors typically provide uniforms to their employees or have dress code requirements. However, airports can implement this method for their own employees.

SECTION 3: AVIATION WORKERS/ESCORTED PEOPLE INSPECTIONS

The following methods are designed to enhance the inspection of people and their personal property. These inspections may occur at a terminal portal (from Public to Sterile, Sterile to Secured), at a vehicle portal, or within the SIDA.

3.1 Technology and Equipment

Each of the following technology methods has its benefits and drawbacks. Airports should conduct in-depth cost/benefit analyses to determine whether the technology is a good solution for their operational needs. Working with Safe Skies to pilot some of these technologies can help airports determine whether the system meets their operational needs (see Section 8.2.2).

When piloting technology, airports should consider product manufacturers who have obtained SAFETY Act Designation/Certification, which protects them from liability while the technology is being field-tested and validated. Airports can search https://safetyact.gov to identify which technologies have SAFETY Act protection.

3.1.1 Biometrics

Biometric authentication technology is quickly becoming one of the most talked about pieces of technology in the aviation community, especially with regards to biometric processing of passengers. However, many airports have been using biometrics as a secondary or tertiary authentication measure for several years.

Figure 3-1. Hand Geometry Reader

Biometric authentication requires some form of biometric token, such as a fingerprint, iris, face, voice, hand geometry (Figure 3-1), or vascular/vein pattern. The biggest benefit to implementing biometrics as part of the access control protocols is that the authentication factor is linked to the individual and cannot be stolen or forged. This makes it significantly more secure than use of a pin code as a second authentication method.

Figure 3-2. Fingerprint Scanner

Source: clipartden.com

Most airports currently using biometrics employ fingerprint technology (Figure 3-2), because fingerprints are already recorded during the badge application process. However, facial recognition and hand geometry are also commonly utilized options.

The Metropolitan Washington Airports Authority (MWAA) developed and deployed their own facial authentication software in 2018 when they were unable to find a product on the market that met their needs. The system utilizes tablets loaded with the custom software to capture and verify facial biometric information of passengers. Some companies offer facial authentication applications that can be used on cell phones or tablets for mobile options. By using tablets, MWAA did not need to reconfigure their gates or install new cabling, and it allows the operator to move about freely as needed. MWAA is not currently using this technology for its employee inspections.

Biometric authentication technology also has its drawbacks. The most obvious is the significant capital improvement investment. In addition to the cost of the equipment, this includes integration with the infrastructure (power, network access, physical location) and integration with legacy systems (initial

system setup, adding biometric tokens to the access control system). There are also associated costs of maintenance, technical support, and end user training to consider. Additionally, some hardware is susceptible to failure under certain circumstances such as dust or dirt on the scanner, oil or other substance on fingertips or the scanner glass, extreme temperatures, and lighting conditions.

Biometric technology is still relatively new and constantly evolving. As the technology matures and more manufacturers enter the market, the cost is likely to decrease, and common operational issues will be solved. Some airports have chosen to save funds by only adding biometric devices at portals that lead from a less secure area to more secure area, such as from the Public Area to the Secured Area and the Sterile Area to the Secured Area.

Studies of the public using biometric tokens have shown a positive acceptance and high satisfaction with the technology. Yet, there are many who express concerns over privacy, stolen information, and profiling. Some jurisdictions and cities have chosen not to allow facial recognition technologies due to concerns with privacy and personal data collection and usage.

3.1.2 Mobile Card Readers and Fingerprint Scanners

Mobile card readers and mobile fingerprint scanners (Figure 3-3) are small, handheld devices that allow inspectors to verify an aviation worker's identity and authorization in areas without a permanent or mounted device. These are especially useful for performing badge checks in diverse and non-traditional locations (Section 3.3.2), and randomly throughout the Sterile and Secured Areas.

Figure 3-3. Mobile Fingerprint Scanner

The device requires access to a wireless network to confirm authorization by the access control system; this may require the airport to install wireless hotspots.

Some manufacturers offer devices that can be attached to mobile phones to read badge information stripes or read fingerprints.

Mobile devices run on batteries, which require regular charging. The battery life will depend on the device model and usage level. Airports should consider purchasing backup devices for redundancy in case of connectivity loss or equipment failure.

Adding a secure network may be costly for some airports if the required infrastructure is not in place. Additionally, network connection and cell service may not be available at remote locations, rendering the devices non-functional.

3.1.3 Detection at Range

Detection at range technology, sometimes called standoff detection technology, is a type of specialized camera that uses passive terahertz radiation and automated detection capabilities to identify concealed objects on people. The technology claims to be able to detect objects hidden under a person's clothing or other concealment material as they walk through the camera's detection area, without the need for that person to divest or stop for an extended period. In some cases, the people being checked may not even be aware that they are being inspected—an aspect that could bring up privacy concerns in certain states and local jurisdictions.

The technology is capable of identifying concealed objects up to 25 feet away from the sensor, including metallic and non-metallic items, IEDs, plastic explosives, and liquid threats. Detection at range does not

have the capability to image anatomical details, which mitigates the body privacy issues associated with some other detection devices such as the millimeter wave (MMW) full body scanners used at the TSA checkpoint.

It is less expensive than some walk-through detection devices, can be moved easily to meet operational needs, and claims to be easier to operate and maintain than other detection equipment. It does not require any special power infrastructure, but may not be compatible with existing technology infrastructure.

The technology can also compare facial images of people passing through the detection area to image databases such as the biometric profiles maintained by the DHS, or a database of aviation workers.

The technology has only recently come to the attention of the aviation industry, and currently no airports have deployed it, even though the technology has been approved by TSA for people-inspection applications. Some larger airports indicated looking into the technology for future use in employee inspections.

3.1.4 Hand-Held Metal Detectors

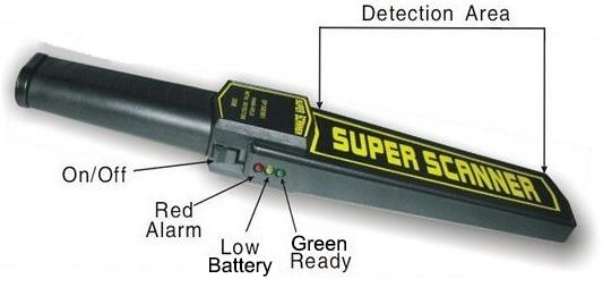
Hand-held metal detectors (sometimes called hand wands) are lightweight devices designed to detect metal on people. Often, hand-held metal detectors are used as a secondary or backup inspection method for other technology, such as when an alarm is triggered on a walk-through metal detector and the operator needs to resolve the source of the alarm.

The detection area is different for each device model, but is almost always located in the middle of the device, not including the handle (as shown in Figure 3-4). There are areas of the device that cannot detect metal and the devices typically only detect metallic objects when held approximately 2–3 inches from the body. This makes hand-held metal detectors one of the easiest devices to use incorrectly; thus, proper training of operators is essential.

Field tests show that the effectiveness of these devices varies greatly from user to user, and will wane over time as the user grows tired, bored, or feels pressured to work quickly to reduce queues.

Additionally, the devices can only detect metallic objects; they offer no explosives detection or non-metallic threat detection.

Figure 3-4. Example of a Hand-Held Metal Detector



Source: szxldh.com

The devices are completely mobile and use battery power to operate. The battery life depends on the usage, manufacturer and model, but the devices can typically be used for 8 to 30 hours on a single charge or set of batteries.

DHS has provided some tips and tricks to use when deploying hand-held metal detectors:

- Test often to ensure the device is working properly
- Keep extra batteries nearby
- Keep an instruction manual nearby for easy reference

While these devices are not an ideal primary inspection solution, hand-held metal detectors are inexpensive, portable, and simple to use. However, they are also easy to use incorrectly if the operator has not been trained properly or the device has run low on battery power.

3.1.5 Walk-Through Detectors

Walk-through detection machines offer airports a fast and non-intrusive method to detect certain prohibited items.

Figure 3-5. Example of a Walk-Through Metal Detector

Source: PQ77WD; commons.wikimedia.org

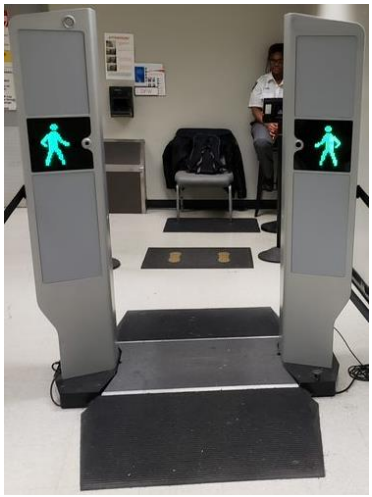
The simplest of these devices is a walk-through metal detector, like the one shown in Figure 3-5. These use magnetic fields to identify metallic objects on a person walking through the detection portal. The machines generally have a small footprint (about the size of a doorway) and are relatively inexpensive. However, some models have high false alarm rates, and inspectors will need to resolve them by some other methods, such as a hand-held metal detector (as described in Section 3.1.4).

Single-zone walk-through metal detectors are designed to detect an anomaly, but are not capable of pinpointing the area that triggered the alarm. Conversely, multi-zone walk-through metal detectors have multiple detection indicators that are capable of identifying the general area that triggered the alarm, which allows for a more focused secondary inspection.

The DHS has several tips for using walk-through metal detectors:

- Ensure the device is in a well-lit location and sheltered from inclement weather.
- The location must provide sufficient electrical power.
- The device needs to be tested periodically (at least daily) to ensure it is operating correctly and does not require maintenance.
- Have a backup method of inspection in case of equipment malfunction or failure.

Figure 3-6. Walk-Through MMW Detection Technology



Some newer devices, like the one shown in Figure 3-6, use MMW technology—the same technology used in TSA's Advanced Image Technology scanners at the passenger security checkpoint—to detect metallic and non-metallic threats as the person walks through the detection area. The passive radiation given off by the human body is used to identify dense objects on the body and beneath clothing, allowing for a wider range of threat detection. These devices are more expensive than their walk-through metal detector counterparts. Some models are portable and can be moved between access portals if necessary. The device's sensitivity will need to be carefully configured to meet the operational needs of the airport, which could require weeks of working with the vendor/manufacturer.

Some models have a facial recognition feature, which would automatically identify people of interest on a restricted access list.

Although these devices are designed to detect the presence of items such as a handgun or potential IED, they are not designed to detect explosive traces. Additionally, users have

mixed reviews on the accuracy of the devices, with some users claiming the device was unable to detect concealed objects and often set off false-positive alarms during test runs.

Some consideration needs to be given to policies that dictate what can and cannot be passed through the detection area. For instance, some walk-through metal detectors and MMW devices are affected by magnets, which can set off false alarms. Magnets are in more electronics that many people realize, including headphones and cell phones. Additionally, some aviation workers and contractors wear steel-toed boots to safely perform their job duties, which could generate alarms. The same is true for people with medical implants. Policy may need to dictate that these people need to use the TSA checkpoint. All of these considerations may limit the applicability of these devices.

3.1.6 Explosives Trace Detection (ETD) Machines

These devices are designed to quickly and accurately detect minute traces of explosives in a sample gathered from a person or object. Traditional ETD machines use the swipe method to pick up a sample, but newer technology allows for the device to "sniff" an air sample to be analyzed in much the same way as trained canine teams (Section 6.1.4).

There are many types of ETD machines using different technologies to detect explosive traces. When comparing ETD technologies, airports should consider false alarm rates, as high false alarm rates impact the overall effectiveness of this method.

A desktop ETD on a wheeled cart with a locally rigged power supply offers some mobility, but may be difficult to push or pull through a narrow hallway or doorway. Semi-portable and portable ETDs are being piloted, but these have demonstrated mobility and performance issues. Additionally, handheld devices have been shown to be less reliable and effective than their desktop counterparts.

3.2 Inspection Policies

The following sections describe methods that are currently being used at some airports to enhance their employee inspection programs and meet their operational needs. Like all methods in this report, airports will need to carefully consider whether these policies will work within their current program and enhance their overall program.

3.2.1 Temporary/Visitor Pass

Airports have many individuals who need to be escorted into the Sterile and Secured Areas. These individuals can include contractors, vendors, concessionaires, and researchers. Issuing these individuals a temporary or visitor pass, such as the one in Figure 3-7, to wear while within the restricted areas will easily identify them as a non-aviation worker. This will also indicate that an authorized escort must be near them.

An important security enhancement is to compare the visitor's ID against the TSA's Secure Flight database, internal violation database, and other restriction lists prior to issuing the temporary pass.

Figure 3-7. Example of a Temporary/Visitor Pass

3.2.2 Inspectors Swipe Badge

With this method, the inspector physically handles the aviation worker's badge during a badge check and swipes the card through the card reader (either mounted/permanent or mobile). Physically touching the badge allows the inspector to test its authenticity, and swiping the card prevents any form of piggybacking.

3.2.3 Portal Curfews

Some airports—especially small airports that use TSA checkpoints as the primary or only access portal—enact portal curfews. Essentially, when the TSA checkpoint closes or flight operations stop, these airports require that all aviation workers, vendors, and contractors use a specific access portal to pass between the Public, Sterile, and Secured Areas.

The airports currently using this method have an operational need because their primary access portal is closed during certain hours of the day. However, other airports could use this method to further funnel individuals through fewer access portals outside of busy flight operation hours, making it easier to inspect more individuals during those hours.

3.2.4 Rotate Inspectors

If portals are staffed for significant portions of the day, inspectors should be rotated throughout their shift and workweek. This can be done by assigning them for a few hours at one location and then moving them to another location/duty, or by assigning them to different portals each shift.

This offers two benefits. First, it relieves potential boredom or fatigue, which could result in less thorough inspections or missed suspicious behavior. Second, it reduces the chance that the inspector will become overly friendly with the aviation workers they are inspecting. While some familiarity allows inspectors to notice behavior and pattern changes, it also presents the opportunity for an insider to conspire (knowingly or unknowingly) with an inspector to breach security measures.

However, stationing the same inspector at the same portal has the added benefit of creating a community policing culture (more on Community Policing in Section 7.2.2), and allows the inspector to learn routines and behaviors. The airport should carefully consider which option works better for their operations and culture.

3.2.5 Full Employee Inspections

Sometimes referred to as "every person, every time" and "100% inspection," this method suggests that while an inspector is stationed at an access portal (whether randomly, continuously, or intermittently), that inspector will inspect every person that passes through the portal. This eliminates the need for the inspector to remember how many people have passed before the n^{th} person needs to be inspected, as required with random methods, and lets them focus on performing the inspection correctly and effectively.

Of course, this method often means that the same aviation workers could be screened multiple times a day as they cross between the Public, Sterile, and Secured Areas for their job duties. This is especially true at smaller airports with aviation workers performing job functions that require them to travel throughout the airport. For airports with high traffic volume, this may create long queues and wait times, but proper layout, staffing, and technology design can help manage throughput.

3.2.6 Continuous Random Inspections

Continuous random inspections in this context refers to a very specific type of randomization. In this type of inspection, the inspector pulls aside the first person to arrive at a portal to be inspected. While that inspection is being performed, other badged people may pass through the portal as normal. When that inspection is complete, the inspector stops the next person to pass through the portal.

Many airports perform this type of inspection as it is an unbiased method for randomly selecting who will be inspected. However, some airports using this method point out that occasionally an aviation worker traveling with a group would "volunteer" to undergo the inspection so that the others did not have to or one aviation worker would "volunteer" another for the inspection allowing for the potential to defeat security.

Inspectors should be trained on the airport's policy for managing this type of situation. Some policies dictate that the person volunteering another is chosen for inspection. Others may dictate that everyone in the group gets inspected.

This type of inspection can also be modified to use technology-based randomization (discussed in further detail in Section 6.2.1) or other randomization policies.

3.3 Portal Locations

Airports, regardless of size or layout, have several options for creating and utilizing portal locations. Whether using existing space, creating new locations, or setting up temporary portals, airports should carefully consider what works best within their operations and needs.

Some portal locations may be difficult and expensive to modify because of the physical construction and infrastructure changes needed to accommodate the alterations. Careful consideration needs to be given to creating new locations.

3.3.1 TSA Checkpoint

Some airports require that certain badged vendors, concessionaires, tenants, and contractors use the TSA checkpoint to access the Sterile Area. This method reduces the number of inspections required to be performed by the airport, but it also puts more pressure on the checkpoint, which may cause longer queues for passengers.

One alternative to this method is to only send the employees of concessionaires/vendors that make one or two deliveries a week (such as soda machine vendors) or concessionaires/vendors/tenants with a small number of employees through the checkpoint.

Another alternative would be to only allow or to schedule checkpoint usage during periods outside of peak passenger usage.

Some airports using walk-through detectors at their access portals require employees with medical implants to go through the TSA checkpoint.

3.3.2 Non-Traditional Locations

Some airports have chosen to move or add inspection locations to non-traditional areas such as employee parking lots, employee bus/tram stops, oversized bag doors, stairwells, and outside of

elevators. There are several benefits to conducting inspections in these areas in addition to the traditional portals in the terminal and AOA. They can be effective so long as aviation workers inspected in these locations are always segregated from the uninspected public. If this is not possible, the aviation workers should only be subjected to the airport's inspection policies in the traditional spaces.

First, most airports never have the opportunity to inspect non-badged concessionaires/tenants or Public Area-only badged aviation workers, as they have no need to pass into the Sterile or Secured Areas. By inspecting outside of the terminal building or in the Public Area, the airport can ensure that everyone working at the airport has been inspected or has the expectation of being inspected during their shift.

Second, employee buses and trams transiting from employee lots to the terminal create surges of aviation workers queueing to be inspected or pass through access portals, which increases the wait time for the individuals. Inspecting aviation workers and non-badged concessionaires/tenants /Public Area-only badged aviation workers as they arrive at the bus or tram stop creates a steadier flow for inspections and potentially allows for more aviation workers to be inspected than would be practical during a surge at the terminal access portal.

Additionally, depending on airport policy and inspection location, individuals found with prohibited items have the opportunity to return the item to their vehicle without a security violation. The justification for this could be that the employee parking lots are often classified as restricted areas and not part of the SIDA.

Third, establishing inspection locations at oversized bag doors, stairwells, and elevators provides an opportunity to inspect aviation workers who rarely need to pass through the "official" terminal portals. It may also increase the likelihood of catching insiders attempting to circumvent the inspection process. Pairing pop-up, temporary inspection locations with blind presentation (Section 3.3.5) gives airports an additional opportunity to catch insiders off guard.

However, there are some logistical concerns with some non-traditional inspection locations. It takes more time to set up a temporary screening area with furniture (chairs and tables), technology (portable walk-through metal detectors and ETD machines), and inspector toolkits (mobile card readers and fingerprint scanners). For portable technology, a power supply may be required. If mobile devices are being used to validate authorization, the area needs to allow for a wireless connection. Some hallways may not allow for inspection carts and furniture to be transported or set up.

The key to an efficient use of resources at a non-traditional location is to make sure it is a well-traveled area. Stationing inspectors at a location that only 1% of the aviation worker population uses during the day is not the best use of available resources unless there is an operational justification, such as if all the employees using that elevator throughout the day use it within a four-hour period.

3.3.3 Reduced Number of Portals

There is a standing recommendation from the ASAC and TSA to reduce the overall number of access portals. By reducing the number of portals that an aviation worker can use to pass into the Sterile or Secured Areas, airports can more effectively deploy their limited inspection staff and equipment resources, which streamlines the inspection operations and reduces overall costs. This method also assists the TSA's Advanced Threat Local Allocation Strategy (ATLAS) teams by funneling or directing aviation workers to portals where the teams are more likely to be stationed.

It should be noted that fewer portals may make it easier for insiders and potential bad actors to learn inspection routines, allowing them to circumnavigate security measures.

Continual reassessment of the operational need for each portal and the subsequent deactivation of unnecessary portals will enhance the security of the airport through increased control.

3.3.4 Future Portals

If an airport is being re-developed, they can use the design phase to ensure that new portals are large enough to accommodate future inspection equipment. It is always possible that new regulations will require new technology equipment that may have a larger footprint than the current equipment. Planning for that eventuality during the design phase will help alleviate future issues.

3.3.5 Blind Presentations

This involves stationing the inspectors behind some sort of partition, such as a wall or door, so that a badged person is not aware that inspections are taking place at that portal before they have committed to using it. Some layouts lend themselves to this method, but this may be challenging to implement at many airports.

3.4 Portal Types

A uniform portal solution for all airports is impractical and does not necessarily enhance the security of the aviation system. A one-size-fits-all approach removes the flexibility an airport needs to address their specific threats and risks. Each access portal needs to be adapted to fit the unique layout and configurations of the airport location. Portal types may vary greatly, even within the same terminal building. The following is a summary and discussion of common portal types.

3.4.1 Turnstile Access Portals

Turnstiles (Figure 3-8) are very common in airports at access portals leading from the Sterile to Secured Area and the Public to Secured Area. The turnstiles nearly eliminate the problem of piggybacking and tailgating. Space and layout of the airport will be a significant consideration, but airports should also determine if walls or perimeter fencing needs to be removed to install the turnstiles.

Figure 3-8. Example of a Turnstile Portal

Source: Turnstile Security Systems, Inc.

3.4.2 Sally Port-Style Portals

These are “hallways” with two sets of access portals frequently controlled so that only one access point may be opened at a time, creating a “trap.” Airports can station inspectors inside this hallway as a blind presentation (Section 3.3.5) to prevent circumventing inspections. Often, both doors have a badge reader, which requires the aviation worker to provide authorization twice in order to pass into the Secured or Sterile Area. Ultimately, airport layout and space will determine if this method is possible.

3.5 Personal Property Inspection Technology

Aviation workers often bring personal property—backpacks, purses, lunch bags, and other carried items—to work. The following sections describe technology, equipment, and methods for inspecting aviation workers’ personal property.

Please note that while some of these methods can be used to inspect tools of the trade and contractor equipment, a more detailed discussion of contractor tool inspections can be found in Contractor Inspections, Section 5.5.

3.5.1 Flashlights and Sticks

Flashlights and sticks are the most basic of equipment that can be used to conduct inspections of personal property, and are often used in stadium-style inspections of bags.

A stick—such as a paint stirring stick (Figure 3-9)—can be used to move items inside a bag without needing to make contact with the items. This helps protect the inspector against accusations of theft by the bag owner, and keeps the inspector's hands clear of sharp objects and toxic residue. The stick can also be used to tap the sides and bottom of the bag, which can help determine if the bag has a false bottom or hidden compartment.

Flashlights are used to illuminate the inside of the bag during inspections. The flashlight does not need any additional features, such as ultraviolet light, but should be small enough to easily wield while manipulating a bag.

Inspectors using this method should ensure each compartment is visually checked to accomplish the most effective inspection.

Figure 3-9. Example of a Stick for Stadium-Style Inspections

Source: Woodman Crafts @ amazon.com

These basic pieces of equipment are inexpensive and can be used by any inspector with only a small amount of training on how to conduct the bag inspection.

3.5.2 Toolkit for Inspectors

An inspector toolkit can be as simple as a bag search stick, a flashlight, and a box of disposable gloves. Alternatively, it could be as elaborate as a wheeled cart (see Figure 3-10) with a hand-held metal detector, mobile card reader, tablet, chair, and trash can. The items that make up the toolkit will depend on the inspection method, associated policies, operational requirements, available space, and budget. The most important factors are that the inspector has everything they need to perform their inspection duties, they know what is needed in their kit, and they know where to find or request replacement items.

If an inspector is not stationed at an inspection location 24/7, consideration should be given to making the toolkit portable, either as a lightweight or wheeled solution.

The toolkit container could be a toolbox, reusable shopping bag, backpack, or a wheeled cart. Some suggestions for items to include in the toolkit include:

- Bag search stick
- Flashlight
- A box of gloves (sizes S-XL)
- Clipboard with inspection log sheets
- Pens/pencils

Figure 3-10. Example of a Wheeled Cart with Inspector Supplies

- Cleaning wipes
- Walkie talkie/radio
- Trash can with trash bag
- Chair
- Container for small items
- Hand-held metal detector (Section 3.1.4)
- Portable ETD (Section 3.1.6)
- Mobile card reader (Section 3.1.2)
- Extra batteries
- Tablet
- Action or body camera (Section 3.5.5)

3.5.3 X-Ray Machines

X-ray machines offer a less intrusive means of inspecting goods and property, but the size of the aperture limits the size of items that can be screened. For personal property such as a backpack or purse, basic machines (such as the one in Figure 3-11) should serve any airport's operational needs. However, for contractor tools, merchandise, and consumables these may not be large enough.

Figure 3-11. Example of a Typical X-Ray Machine

Source: commons.wikipedia.com

Fixed installations in certain layouts and spaces may require special consideration to account for the device's large footprint. Power sources will also need to be addressed for portable options. Both fixed installations and portable devices are moderately expensive and typically require extensive user training to interpret the x-ray images.

Annual certification and maintenance costs should also be considered in addition to the initial procurement costs.

3.5.4 Lighting and CCTV

Good lighting is an important component of inspection strategies. Better lighting will assist inspectors performing their duties, even when performing stadium-style inspections on bags.

Airports commonly have some level of CCTV camera system in areas near the access control portals to support monitoring and surveillance of the portals. It can also be leveraged for monitoring and surveillance of personal property inspections in these areas. Monitoring can be done in real time or forensically to determine a sequence of events. The cameras can also be outfitted to provide video analytics (more in Section 8.1.4).

The area the camera is monitoring needs to be well lit to facilitate good quality video. Any time the camera system is updated, the lighting should also be evaluated to determine whether it also needs to be upgraded to enhance the effectiveness of the new camera system.

When upgrading lighting, airports will need to consider illumination levels, energy efficient lamps, the lamp life, and glare. For airports relying on natural lighting during most of the day and certain parts of the year, special consideration should be given to ensure the cameras remain adequately lit at all times. A special consultant may be a wise investment for airports completing a total redesign of their CCTV and/or lighting system.

The cost of upgrading the lighting will vary greatly depending on the number of lights that must be added or changed and the location of the lights relative to power sources, as well as the cost of replacement bulbs.

3.5.5 Action and Body Cameras

These are small cameras designed to be mounted anywhere to capture action shots (Figure 3-12). Special harnesses can be purchased to wear them on the body. When used by inspectors, they capture audio and video evidence in case of an inspection violation or claim of improper behavior during an inspection.

Figure 3-12. Example of a Small Action Camera

Source: pixabay.com

They are inexpensive and have a small footprint. Training to use them is simple, but airports that currently use this method have indicated that inspectors often forget to turn them on. There may be significant cost associated with storage of the data when large numbers of cameras are in use. Staff time for retrieval and review of the information should also be taken into consideration.

3.5.6 Computed Tomography (CT) Machines

CT devices provide three-dimensional images of bag contents, similar to an x-ray machine, but also provide explosives detection capabilities.

Airports should take into consideration that the devices tend to be costly, typically have a large footprint, are often quite heavy, and are limited in the size of the objects that can be scanned. Additionally, some models require higher voltage power sources than an x-ray machine, which could require infrastructure and cabling changes at the portal location.

Alternative technologies such as ETD machines (Section 3.1.6), which analyze the chemical makeup of vapors to identify explosive traces, have the potential to be more efficient and cost-effective.

3.5.7 ETD Machines

For more details on the ETD technology refer to Section 3.1.6.

3.6 Personal Property Inspection Policies

This section presents policies that airports can enact in order to enhance their personal property inspection program.

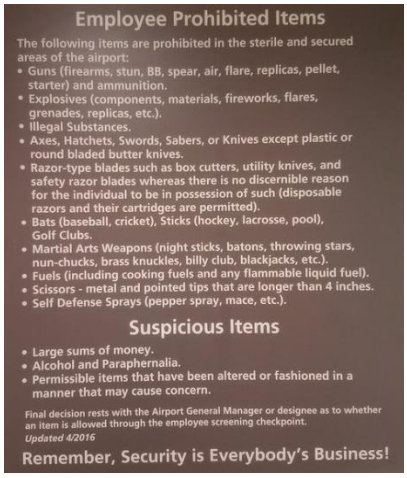
3.6.1 Prohibited Items and Exemptions

Aviation workers often bring bags and purses into the Sterile and Secured Areas to carry their lunches, wallets, cell phones, and work equipment such as headphones and reflective vests. Additionally, some individuals must wear and/or carry items on the TSA's prohibited items list in order perform their jobs (e.g., knives, tools with sharp edges, blow torches, etc.)

Most airports use the TSA's Prohibited Items List for passengers (see Appendix A) as a guideline to define what items aviation workers and contractors are permitted to bring into the Sterile and Secured Areas. However, the TSA permits aviation workers to bring liquids, gels, or aerosols exceeding 3 oz into the these areas. Despite this, some airports have chosen to prohibit liquids (such as bottles of water),

which has been shown to cause some tension in the aviation worker population as they would be limited to purchasing drinks or returning to their vehicles (if permitted).

Figure 3-13. Example of a Posted Prohibited Items List



Generally, aviation workers have more restrictions when passing through a TSA checkpoint, and often must comply with TSA's standards. Employee checkpoints tend to be more lenient, allowing for food and drink items that would be restricted at a TSA checkpoint. Common exemptions to the TSA's Prohibited Items List include liquids, aerosols, and gels exceeding 3 oz; and tools of the trade for contractors such as knives, saws, torches, and other tools needed to perform their job. For more details on policies regarding tools of the trade and special equipment, please refer to the Contractor Inspections, Section 5.5.

Posting an employee prohibited items list (Figure 3-13) in areas frequented by aviation workers (break areas, access portals, etc.) has the benefit of reducing the number of discovered prohibited items and shows that the airport has a consistent expectation of the employee inspection process.

3.6.2 Restrict Bags

Reducing the number of bags that need to be inspected as they pass through an access portal saves time for the aviation workers and the inspectors. There are a few options if considering the restriction of bags.

1. Restrict the size and/or number of bags
2. Restrict bags to one kind or type, such as a clear bag
3. Prohibit all bags

Each of these will reduce the number of bags needing to be inspected, but overall, when the airport policy requires the inspection of bags entering the SIDA, aviation workers voluntarily reduce the number of bags they bring to work, presumably to speed up the inspection process. However, airports that have placed restrictions on bags received some pushback from aviation workers, especially at those airports without locker space in the Public Area.

Figure 3-14. Example of a Bag Template

Option 1: The most common option currently used by airports is to restrict the size and number of bags permitted within the SIDA. It is up to the airport to determine the exact size or number to allow, but the policy should be very clear in the guidelines. The size limit should be specified by dimensions or volume (e.g. 9 x 9 x 6-inch or 2 L capacity), not vague descriptors such as "small backpack." This reduces confusion and will mitigate arguments between aviation workers and inspectors—although airports using this method still claim some tension on occasion. Providing a template or bin demonstrating permissible bag size (such as the one in Figure 3-14) will help eliminate ambiguity over whether an aviation worker's bag is larger than the allowable size.

Option 2: Many organizations outside of the aviation industry require employees to use clear bags. This makes the inspection process faster as inspectors will not necessarily need to open the bag to see what is inside. However, if the aviation worker has placed an opaque bag inside the clear one, the inspector will need to address that during the inspection.

Most organizations using this option will issue a clear bag to each employee to improve compliance and decrease resistance to the policy. However, this can be cost prohibitive for airports, especially if supplying the bags for all aviation workers. Requiring tenants and concessionaires to provide clear bags for their employees working within the SIDA will offset this cost but may result in push back from those companies.

Option 3: Prohibiting all bags within the SIDA eliminates the need for nearly all personal property inspections, although it is likely to create an increase in jackets and coats, which would be capable of holding the aviation worker's personal property (see Coat/Jacket Inspections, Section 3.6.5).

However, this option will likely cause the most discontent within the aviation worker population. Airports considering this option should carefully consider how they propose to allow aviation workers to store their property, such as their lunch or equipment, on the Public Side. This may cause high levels of stress and tension since most airports have aviation worker lockers and break rooms in the SIDA.

If considering option one or two, airports should consider providing incentives for aviation workers without bags (such as access to a faster moving queue), which may encourage more workers to leave bags at home or in their car.

3.6.3 Return to Vehicle

This simple method would allow aviation workers to return prohibited items such as metal butter knives or water bottles, if those are prohibited, to their personal vehicle without consequence. This would not apply to more serious items such as knives (those not needed to perform job functions) or pepper spray. This method promotes a community policing culture (more in Section 7.2.2) by allowing the airport to appear sympathetic to simple mistakes.

However, some airports prohibit employees from returning to their vehicles during their shift.

3.6.4 Amnesty Boxes

Amnesty boxes are locked containers stationed at the access portal that would allow an aviation worker to voluntarily surrender a forgotten prohibited item without receiving a security violation or having to return the item to their vehicle.

Items such as metal butter knives, screwdrivers, and pocketknives of a certain length could be deposited into the box or container and be disposed of later by LEOs or security personnel. For open carry states, firearms should never be deposited into the box but should be surrendered directly to LEOs for immediate securing and later disposal.

Amnesty boxes may be most useful for airports changing their prohibited items list to be more restrictive. Aviation workers are more likely to bring previously non-prohibited items during the first week or so after a transition such as this. By providing a means of surrendering the item without significant consequence, the airport fosters a sense of community policing (more in Section 7.2.2) instead of potentially creating resentment.

Amnesty boxes should only be used as a temporary solution, never as a permanent solution. Permanent deployment could result in aviation workers abusing the policy to avoid legitimate notices of violation.

The box or container should always be locked and supervised such that a person would not be able to reach inside to retrieve a surrendered item. Trash cans or other unlocked boxes or containers should never be used as an amnesty box.

If considering an amnesty box, airports need to work closely with local LEOs to clearly define items that can be surrendered without issuing a violation, how long to use the containers as a temporary solution, and how the items in the amnesty box will be disposed of. All inspectors will need training on the policies and procedures, and informational signage will need to be added near the portal to help with the adoption of this method.

Figure 3-15. Example of an Amnesty Box

Source: @CamdenCountyPD on Twitter

3.6.5 Coat/Jacket Inspections

Coats and jackets can pose some problems for inspectors, especially in areas with extremely cold weather. Bulky coats, like parkas, have the capability to hide large items easily.

Many airports don't require inspection of coats and jackets, although this policy is typically seen in areas with more temperate climates. Hand-held metal detectors can be impeded by the bulky material, so it is important for the individual to remove the garment before these devices are used.

Some airports that require coat and jacket inspections require the individual to take off the outerwear and present it to the inspector who will "pat down" the garment to feel for items hidden in pockets, or send the garment through an x-ray machine. However, the more common practice is to have the individual open the garment for the inspector to visually check for hidden, bulky items. These visual inspections do not typically include a pat down of the garment while it is being worn.

3.6.6 Secured Tool Storage

This method allows aviation workers who regularly use tools for their job (such as air carrier mechanics or maintenance technicians) to store their tools in a secured tool storage area. This not only helps with tool audits (more in Section 5.5.1), but it also allows for speedier inspections when the tools do not need to be inspected every time the responsible person passes through a portal.

The storage area could be as small as a locked toolbox secured to a desk or as large as a storage shed, but should always be secured and should not be easily moved. This also allows the airport to audit the tool inventory at any time.

SECTION 4: VEHICLE INSPECTIONS

Vehicle access portals see all sorts of vehicles, including sedans, trucks, vans, delivery trucks, construction trucks, tractor-trailers, and many other specialized vehicles. DHS provides tips and best practices for conducting vehicle inspections in their *Vehicle Inspection Guide*[1]. The methods described below are designed to enhance an airport's vehicle inspection program.

4.1 Technology and Equipment

The following technology and equipment offer methods for inspectors to conduct more thorough vehicle inspections.

4.1.1 Radio Frequency Identification (RFID) Tags

Radio Frequency Identification (RFID) tags are short-range proximity markers that attach to a vehicle to act as a unique identifier. When the RFID tag is passed within the read-range of the reader—either a long-range credential reader or a hand-held/mobile reader—the identity information is transmitted to the associated access system and compared to a database of authorized vehicles. Successful authorization may open a vehicle gate, raise a barrier arm, or relay a visual notification to security staffing the vehicle portal.

Figure 4-1. Example of an RFID Vehicle Tag

Source: U.S. Air Force

Assigning RFID tags to vehicles allows the airport to track vehicles in a similar manner to a badge for a person. The tag identifies the unique vehicle identifier, its owner, and other pertinent information. The tags can be activated/deactivated or have flags/alerts placed on them if necessary (e.g., if the vehicle is reported stolen or in an unauthorized area). Using a mounted or hand-held RFID reader, the tag can be scanned to ensure that the vehicle is permitted in the restricted area and that it has no flags. Airports considering this this method should investigate costs associated with issuing and maintaining the RFID database, the RFID tags, and the RFID reader(s).

Long-range readers will need to be mounted in a location and at a height that allows the tags to be read on all vehicles displaying them. This could potentially include baggage tugs, sedans, trucks, delivery trucks, construction vehicles, and 18-wheeler trucks. Additionally, inclement weather could affect the read distance capabilities.

If a hand-held/mobile reader is used, the device needs to have either a wireless connection capability to compare the RFID tag information to the authorized vehicle database, or it needs the capability to store an internal "white list" of authorized vehicles.

Readers stationed at unmanned vehicle portals have the added benefit of keeping a forensic record of the vehicles that passed through the portal, which badge readers alone could not accomplish.

[1] The DHS *Vehicle Inspection Guide* (2012) document is available upon request from the DHS Cybersecurity & Infrastructure Security Agency, Office for Bombing Prevention (OBP@cisa.dhs.gov), or the document and its accompanying video can be downloaded from the DHS TRIPwire website.

RFID tags have relatively low costs per unit and are easily deployed. However, the RFID readers—mounted or hand-held—may be more costly to purchase and install within the existing layout and infrastructure.

Airports utilizing RFID tags will need to develop a backup plan in the event that the wireless signal is lost, which would prevent the RFID readers from accessing the database.

Figure 4-2. Example of an Undercarriage Mirror in Use

4.1.2 Undercarriage Mirrors

These are usually hand-held/portable mirrors on a rod that facilitate the inspector looking under a vehicle for IEDs or other suspicious objects.

The mirrors come in a variety of styles, which will have a negligible effect on the device's price. Many have small wheels on the bottom for ease of movement, and some have attached lights to illuminate the dark undercarriage. Regardless, the equipment is relatively inexpensive.

It should be noted that adding undercarriage inspections using these mirrors can result in a longer inspection process. Additionally, inspectors should be specially trained to identify foreign and concealed items using the mirrors.

4.1.3 Under Vehicle Inspection Systems (UVIS)

UVIS are camera systems that are mounted into or on the ground, or configured as a mobile unit. A vehicle passes over the UVIS as it approaches the vehicle portal, and a video and/or photographs of the undercarriage are sent to a monitor for the inspector to review. Some UVIS include intelligent software that uses license plate recognition (see Section 4.1.6) to identify the specific vehicle being screened, and then compares its underside to pictures captured during a previous scan, or pictures of a similar vehicle make and model. As with other vehicle inspection devices, inspectors using UVIS will require foreign and concealed item identification training.

The systems are specifically designed to survive the elements and the weight of vehicles, which can make them expensive. Installation of the UVIS and associated electrical/network cabling may incur additional construction costs, especially if an area of pavement needs to be removed.

4.1.4 Overhead Mirrors

Overhead mirrors are mounted on poles to provide inspectors with a view of open-top or tall vehicles, such as trucks used at construction sites and garbage trucks. They are relatively inexpensive to install, but also require special training for the inspectors to identify foreign and concealed items.

4.1.5 Overhead Cameras

Overhead camera systems serve essentially the same purpose as an overhead mirror, but with the added capabilities of zoom and recording functions. Consideration should be given to the height of vehicles passing through the portal to ensure the cameras are not clipped as the vehicle passes underneath.

4.1.6 License Plate Readers

License plate readers give airports the opportunity to determine quickly if a vehicle is authorized to pass through a vehicle portal. As the vehicle passes the reader, the license plate number is compared to a database of authorized vehicles. Some systems will open a gate or barrier arm if the authentication is successful. Other systems can send an alert to the gate inspectors acknowledging the vehicles authorization or non-authorization. In all cases, the readers need to be mounted strategically along vehicle route(s) for optimal use.

Forensically, the data could be used to establish a timeline of events or track trends, such as the types of vehicles or peak periods of vehicles passing through the vehicle portal. Some license plate systems offer analytical software to automatically track these trends.

Installation of the cameras is relatively simple, but adding license plates to a database could be time-consuming. For airports that have vendors delivering merchandise and consumables using multiple vehicles, this may be a difficult method to deploy due to the number of license plates that would need to be added to the authorized database.

Depending on how the cameras are set up, the system may be vulnerable to damage. If mounted on a pole, for instance, the pole could be hit, causing damage to the camera or altering its angle enough to prevent it from reading license plates. If mounted at certain heights, large vehicles could hit the camera while passing.

Additionally, there is the possibility of forged or stolen plates, or of an unauthorized person using an authorized vehicle. If considering this option, a secondary method to confirm authorization is recommended.

4.1.7 Upgrade Lighting

For more information on this topic, please refer to Section 3.5.4, Lighting and CCTV.

4.1.8 Inspection Flags

These are flags or another indicator that can be temporarily placed on the dashboard to indicate that the vehicle was inspected. Typically, these items are given to the driver after the inspection but before passing through the vehicle portal, and then returned to the inspector when exiting. The items can be inexpensive, such as a brightly colored block of wood or strip of plastic, or a small toy-like item. The important thing is that the item is not easily forged and is easily noticeable from a distance, and that collection upon exit is stringently enforced.

4.1.9 Wireless/Mobile Card Readers

For more details on this method, please refer to Section 3.1.2, Mobile Card Readers and Fingerprint Scanners.

4.2 Portal Types

Vehicle access portals can be designed in many different ways to facilitate the inspection process. No two portals will be exactly the same, even within the same airport. Airports need to consider the airport layout and configuration carefully when determining the optimal portal type. If an airport is being re-

developed, they can use the design phase to ensure that new portals are large enough to accommodate future inspection equipment.

Additionally, continual reassessment of the operational need for each portal and the subsequent deactivation of unnecessary portals will enhance the security of the airport through increased control.

4.2.1 Sally Port-Style Portals

These are areas with two sets of gates or barriers. A vehicle typically passes the first gate with a badge verification and stops before the second gate opens. The first gate closes behind the vehicle, essentially trapping the vehicle in the space between the two gates. It is at this location that the vehicle inspection takes place. The inspector is often the one to open the second gate after completing the inspection.

This layout has the added benefit of reducing the chance of a forced breach, as a bad actor would need to ram two sets of gates.

The cost of adding two automatic gates or barriers obviously would be twice the cost of installing a single gate. Ultimately, airport layout and space will determine if this method is possible.

4.2.2 Sheltered Guard Stations

Sheltered guard stations at the vehicle gates, as shown in Figure 4-3, will provide inspectors with a place to store tools and equipment, and a place to shelter from the weather. Often, the biggest problem for inspectors is complacency, and in adverse weather (e.g., excessive heat, cold, rain), guards may perform fewer inspections or less effective inspections if they have no place to shelter between inspections.

Figure 4-3. Example of a Sheltered Guard Station

These stations are highly customizable to meet operational needs and available budget. At a minimum, the stations should be enclosed (meaning no open walls or door frames), house a seat for the inspector(s), provide air conditioning and/or heat (depending on typical weather in that area), and necessary security equipment. Some airports go a step further by installing high ballistic ("bulletproof") walls and windows, which would exponentially increase the cost but would protect the inspectors and help prevent a forced breach by a bad actor. Cost of construction, location, and size of the vehicle access portal will all be major factors in the guard station design.

4.3 Inspection Policies

The following sections describe methods that are currently being used at some airports to enhance their inspection programs. Like all methods in this report, airports will need to carefully consider whether these policies will work and enhance their current program.

4.3.1 Full Vehicle Inspections

Many airports indicated that vehicles and vendors were among their biggest inspection program concerns. This concern may be alleviated by full vehicle inspections, which indicates that while an inspector is stationed at a vehicle access portal (whether randomly, continuously, or intermittently), that inspector will inspect every vehicle that passes through the portal. Stopping every vehicle for an inspection may have a significant impact on traffic congestion, especially at airports with many vendor deliveries.

All airports could use this method, but its feasibility will depend on the number of available inspectors and the specific layout of the vehicle access portal.

4.3.2 Continuous Random Inspections

For more details on this method, please refer to Section 3.2.6.

4.3.3 Temporary Access Portals

One Category X airport has developed a contingency plan that turns the exit lane at a vehicle access portal temporarily into an additional entrance lane when the number of vehicles inspected has been significantly increased. This is most likely to occur during irregular operations (e.g., construction, inclement weather) and situations that would close or limit access to other portals (e.g., emergency drills, terminal lock-down). A new exit-only lane or portal will need to be created near the vehicle portal to accommodate this method.

4.3.4 Driver Opens Compartments

For this method, the driver of the vehicle is responsible for opening compartments such as the glove box, storage areas, and trunk. This protects the inspector from being accused of planting prohibited items or stealing, and allows the inspector to monitor both the vehicle and the driver at all times.

4.3.5 Driver Exits Vehicle

Many airports require the driver—and often the passengers—to exit the vehicle. Typically, this is due to the location of the badge reader and a policy requiring the individual to swipe and enter their PIN or biometric.

Inspectors can use the opportunity to visually inspect the inside of the vehicle without the driver's body concealing or obscuring items and compartments.

4.3.6 Driver and Passenger Inspections

All of the methods for inspection of an aviation worker or escorted person can be applied to a vehicle's driver and passenger(s) (see more in Section 3, Aviation Workers/Escorted People Inspections).

Additionally, the inspector may check the validity of the badges of the driver and all the passengers to ensure everyone in the vehicle is permitted to be in the Secured Area.

Some airports allow non-badged individuals—typically vendors—into the Secured Area when escorted. In these situations, the inspector should log the driver's and passengers' identification information before releasing them to be escorted into the Secured Area.

Some airports will be able to supplement this practice with card readers (fixed or mobile) stationed at the vehicle portals, but the equipment has a significant cost and may not be compatible with existing infrastructure.

SECTION 5: VENDOR/CONTRACTOR AND MERCHANDISE/CONSUMABLES INSPECTIONS

Vendors and contractors typically are not badged—and therefore may not be vetted by the airport—and their employers do not always send the same person every time. They often access the restricted areas of the airport, and bring items and tools that are considered prohibited, such as soda bottles and tools.

Below are methods airports can use to enhance the inspections of the vendor and contractor population and the items they need to bring into the restricted areas as part of their job.

5.1 Vendor/Contractor Vehicle Inspection Policies

The vendor/contractor population is a concern for many airports because of their transient worker population and the lower number of badged individuals, which by extension means less vetting. This concern also extends to the vendor/contractor's vehicle, which is often a different vehicle each time they visit the airport.

The following methods can be used to enhance an airport's vendor/contractor vehicle inspection programs.

5.1.1 Designated Vehicle Portals

Some airports have designated one of their vehicle portals for sole use by vendors and/or contractors. Designating a vehicle portal for this purpose removes vendor-related traffic from the other vehicle portals so that inspectors at those portals may concentrate on vehicles and people that will be traveling near aircraft and the occupied terminal areas. This may be used in conjunction with a consolidated vendor facility (Section 5.3.1) or a consolidated loading dock (Section 5.3.2).

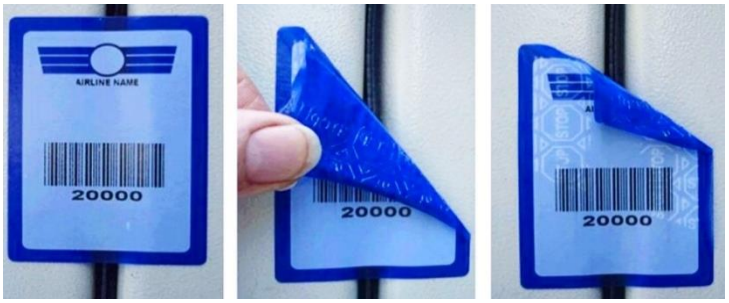
At smaller airports with less traffic, this type of vehicle portal is most effective if paired with just-in-time inspections (Section 5.4.3) and/or a trusted concessionaire/tenant/ contractor (Section 6.1.5).

5.1.2 Tamper-Evident Seals

TSA created the Known Shipper Program and its associated database in 2006. The program certifies cargo shippers to inspect their own cargo at their facilities, to remove the need for inspection by the TSA at the airport. These shippers are certified by TSA and audited regularly for compliance.

Some airports have a similar program for their vendor deliveries. The vendors perform the inspections at their facility and seal the merchandise and consumables with pre-approved, tamper-evident seals with unique

Figure 5-1. Examples of Tamper-Evident Seals



Sources : Top: TamperTechTeam @ commons.wikimedia.org; Bottom Left: Senior Airman Christine Halan/ Released @ mildenhall.af.mil; Bottom Right: Klaus Hasenhuetl @ commons.wikimedia.org

identifiers (Figure 5-1). The tamper-evident seal could be on individual boxes/containers or tamper-evident locks on the vehicle doors.

When a delivery arrives at the airport, the inspectors confirm that the seals match the manifest and the agreed-upon identifier, which is often called in prior to the delivery. If the seal appears to have been tampered with or shows a different identifier, the inspector can refuse the delivery or conduct a full inspection of the vehicle and its contents, depending on the agreement between the parties. This type of arrangement should be discussed with and approved by the airport's Federal Security Director (FSD). An example of a seal agreement form can be found in Appendix B.

Figure 5-3. Example of Tamper-Evident Tape

Source: TamperTechTeam @ commons.wikimedia.org

Inspecting the boxes/containers before they are loaded onto the delivery vehicle reduces some of the logistical complexities of breaking down pallets and carefully stacked carts for inspections. This method does alleviate some responsibility from the inspectors and, as a result, saves time, but airports will need to work with the vendors to ensure the inspections conducted at these offsite facilities meet TSA and airport requirements.

Tamper-evident tape (Figure 5-2) could be used in place of or in addition to the clear tape typically used to seal boxes, and would quickly indicate if the box had been opened and resealed.

Figure 5-2. Example of an Electronic Seal

Source (modified): Jointech @ en.alibaba.com

Electronic seals (Figure 5-3) are available and are generally used as a locking mechanism for the delivery vehicle. When tampered with, the electronic seals transmit an alarm. They can be reused if unbroken, but can be expensive devices to replace. Additionally, the alarm signals of some models have a limited transmission range, and some experts have expressed concern that the signals may cause interference with aircraft electronic systems (Elias 2010).

One thing to note is the concern that the identifiers (tags, stickers, etc.) could be stolen or counterfeited. Airports considering the use of this method should take great care to ensure all identifiers are regularly accounted for.

5.1.3 Authorized Driver and Vehicle Lists

For this method, the airport would require the vendor/contractor company to provide driver name(s) and driver's license number(s) in advance, as well as all vehicle license plate numbers for vehicles that will be driving at the airport.

This offers two benefits. First, it enables the airport to utilize available vetting options. Second, creating agreements with the vendor/contractor company that state only the individuals and vehicles on the list are permitted in the Secured Area allows the airport to deny individuals and vehicles not on the list.

Requiring a photo of each person and vehicle offers an additional means for inspectors to ensure their authorization.

5.1.4 Aisle Walkway

Some airports require that delivery vehicles create an internal aisle that allows the inspector to walk to the back of the truck and visually inspect each pallet, cart, or box. Depending on the width of the truck and the merchandise and consumables inside, the aisle may be in the center or to one side.

It is important to note that, although it is not federally required, some airports break down the pallets into individual units to ensure each box or container has been commercially sealed and has not been tampered with.

5.2 Merchandise/Consumables Inspection Technology and Equipment

Manual inspections of merchandise and consumables are challenging in numerous ways. The most obvious challenge is a result of the human component: the inspector. The quality and effectiveness of a manual inspection depends on the training and skillset required of the inspector, with observation being the chief skill needed.

The other challenge is the equipment and tools required to conduct the inspection. Equipment and technology that provides automated detection capabilities removes some of the need for the inspector to determine whether a prohibited item is present. Currently, there is no technology capable of fully automatic inspection without need for human intervention. However, there are several options available that require only minimal human interaction.

Figure 5-4. An X-ray Machine Designed to Scan Bulky Items

The Implementing Recommendations of the 9/11 Commission Act of 2007 (P.L. 110–53) specifies methods approved for the inspection of cargo placed on passenger aircraft. These methods include "x-ray systems, explosives detection canine teams certified by the TSA, or a physical search together with manifest verification." These methods are also options for airports when inspecting merchandise and consumables.

5.2.1 X-Ray Machines

X-ray machines offer a non-intrusive means of inspecting goods and property, but tunnel size limits the size of items that can be screened.

Fixed installations may prove difficult for certain layouts and spaces given the large device that is usually required to inspect pallets and large boxes (Figure 5-4). These larger devices are almost exclusively stationed in consolidated vendor facilities (Section 5.3.1) and consolidated loading docks (Section 5.3.2). For more details on the devices refer to Section 3.5.3.

5.2.2 Electromagnetic Inspection Scanners (EMIS)

Electromagnetic inspection scanners (EMIS; Figure 5-5) are specifically used to detect metals in boxes and containers. The devices have a smaller footprint than many x-ray machines and scan very quickly. They also have a low false alarm rate.

Figure 5-5. Example of an EMIS Machine

These devices are useful when inspecting certain types of merchandise and consumables, but are not appropriate for all. For instance, any merchandise with metal (e.g., keychains, magnets, metal water bottles, etc.) and even some consumables (e.g., potato chip bags have a thin layer of aluminum inside) will set off the EMIS and will require a manual inspection.

5.2.3 ETD Machines

ETD machines are not widely used at airports to inspect merchandise and consumables, but the technology has the potential to improve security and enhance the inspection process. One common use of the technology is to inspect liquor bottles (Beckman et al. 2010).

For more details on the technology refer to Section 3.5.7.

5.2.4 Computed Tomography (CT) Machines

For more details on these devices, please refer to Section 3.5.6.

5.2.5 Pulsed Fast Neutron Analysis

Pulsed fast neutron analysis technology is used to screen large containers and bulk items for explosives, hazardous chemicals, radiological and nuclear materials, and other potential threats. The device is able to determine the composition of the contents and differentiate between metals, organics, plastics, and other materials. However, it is not an automated process and requires trained personnel to run and resolve alarms.

A pilot of this technology was conducted at the George Bush Intercontinental Airport (IAD) from 2005 through 2007. The pilot report stated that the scanner had high detection rates and low false alarm rates. With the high cost of the device and its large footprint—described as being as big as a truck and capable of scanning an entire stacked pallet—this system may not be a practical option for some airports to implement.

5.2.6 Inspection Stickers, Stamps, and Tags

TSA currently approves a variety of stickers, stamps, and tags to be used as inspected cargo identifiers. Using the same principal, airports could employ inspections stickers to indicate boxes/containers or vehicles that have been inspected by an airport-designated inspector at a previous time and location.

For instance, vehicles inspected and then driven to the opposite side of the airport could have a sticker placed on the vehicle or manifest to indicate an inspection had been completed. Or, boxes/containers that have been inspected and will be stored onsite before delivery to the Sterile Area could be tagged to indicate a completed inspection.

Additionally, TSA regulations require merchandise and consumables in boxes or packages that have been commercially prepared, labeled, and sealed to be physically opened when there are signs of tampering. This process would include breaking down pallets that are not shrink-wrapped or that show other signs of tampering.

At least one airport has chosen to open any container that may have been opened and resealed to look as though it was commercially sealed (e.g., any box sealed with clear tape would be opened and the contents inspected). Airports that are required by their ASP to open all boxes or break down pallets could utilize stickers, stamps, or tags to mark boxes and containers that have been opened and inspected.

5.3 Merchandise/Consumables Inspection Locations

Airports currently use several locations to inspect merchandise and consumables, including the passenger screening checkpoint, aviation worker access portals, vehicle access portals, consolidated

vendor facilities, and consolidated loading docks. In general, the consolidation of inspection locations is the most efficient use of space, budget, staff, and resources. Full public visibility and delivery through the terminal doors is least desirable.

5.3.1 Consolidated Vendor Facility

This is a secured, dedicated building, usually on the AOA, where all vendors must deliver their goods and merchandise. Usually, the dock master (often a contracted third party) is responsible for inspecting each vehicle and any merchandise and consumables. The dock master is also usually responsible for delivering the items from the vendor facility to the Sterile Area, although some airports require their concessionaires to pick up their items. Overall, this improves the security of the airport, especially by limiting access to the AOA by unvetted vehicles and vendors.

Consolidated vendor facilities offer several benefits. All merchandise and consumables arrive and are inspected, marked, and sealed at one common location, and are internally distributed without need for further inspection, which makes it a more efficient, consolidated, and secure process. With a small staff at the facility, there is less handling of and access to the product, which reduces the potential for insider threat and shrinkage. Additionally, the delivery times can be tightly controlled and managed by the dock master, which reduces queues and vendor wait times.

However, it is important to note the downsides to this approach. The most obvious is the actual construction of the facility—the best location, the necessary size, and the cost and time of construction. Technologies such as x-rays, ETD, and CT machines need to be considered to enhance the inspections, but should be appropriate to the operations. With a third party managing the operations of the facility, there will be overhead costs, including issuing badges to the staff, and they will need regular audits to ensure compliance with TSA regulations.

Additionally, concessionaire and tenant buy-in is not guaranteed, as the cost to build and maintain the facility and operations often falls on them in addition to liability concerns over extra merchandise and safe handling of consumable food. Some airports have received considerable pushback from their concessionaires to the point that the entire concept was abandoned. Airports considering one of these facilities should hold discussions with their tenants, vendors, and concessionaires early in the planning process.

A more in-depth discussion on consolidated vendor facilities, including effective strategies to ensure stakeholder buy-in, can be found in PARAS 0024: *Consolidated Receiving and Distribution Facilities at Airports* (publication anticipated in late 2020).

5.3.2 Consolidated Loading Dock

This is an area where merchandise and consumables can be delivered and inspected before being delivered to secure storage or the Sterile Area, as shown in Figure 5-6. It has many features of a consolidated vendor facility but relies on the concessionaires to receive the deliveries, although many are run by third-party dock masters. The distribution of the deliveries may require concessionaires to travel farther to receive their products, and a temporary storage area for concessionaires next to the loading dock may be necessary.

Figure 5-6. Example of a Loading Dock Set Up

As with any new facility, the construction can be costly and proper location will be paramount. The optimal situation would have the delivery side of the dock in the Public Area and the storage and receiving side in the Secured Area with a secure gate inside separating the two. However, vendor buy-in is often easier to obtain as compared to a consolidated vendor facility.

5.3.3 TSA Checkpoint

Some vendors and airports require that certain badged vendors and concessionaires with merchandise and consumables use the TSA checkpoint to access the Sterile Area. This option reduces the number of inspections that need to be performed by the airport, but it also puts more pressure on the checkpoint and may lower the level of service to passengers.

One modification of this method is to only send the vendors and concessionaires with one or two deliveries a week through the checkpoint. Airports could also designate hours or schedule deliveries to limit the impact to passengers.

5.4 Merchandise/Consumables Inspection Schedule

Inspecting deliveries of merchandise and consumables can be time consuming. Many airport inspectors are employees who perform inspections as one of their many job duties. Often the inspections come at inconvenient times and interrupt other job responsibilities. The following are methods airports use to manage vendor deliveries.

5.4.1 Specific-Hour Access

During specific times of day, such as peak hours, an airport can direct deliveries exclusively through designated access portals where inspectors could be stationed. Generally, these designated portals would be deactivated during non-peak hours, such as outside of flight operating hours, but the specifics would need to be determined by the needs of the airport and concessionaires. This allows for more efficient scheduling of inspection staff while limiting ramp exposure and reducing vehicle traffic.

5.4.2 Scheduled Vendors

By creating specific blocks of time for each vendor and concessionaire to receive deliveries, the airport can station inspectors at the specified times and locations to ensure all the deliveries are inspected

without having to staff the locations at all times. It also allows concessionaires to plan their workday around the delivery period.

The airport will gain more buy-in if they work with their vendors and concessionaires to determine the schedule. Scheduling outside of flight operations or during off hours could help relieve traffic.

This method may be more feasible for smaller airports that tend to receive fewer deliveries.

5.4.3 Just-in-Time Inspections

This method has the vendors or concessionaires call to request an inspector when they reach the access portal, if one is not already stationed at that location. Alternatively, a gate guard could radio ahead to an inspection location that a vehicle needing inspection is en route so that an inspector can meet the vehicle. For airports that do not receive deliveries often, this can be an effective way to utilize a limited number of inspectors. It is likely that airports with fewer deliveries will benefit most from this method.

5.5 Contractor Inspections

Contractor inspections share many of the same characteristics of inspections of aviation workers and escorted people, except they are more likely to need prohibited items as part of their work tools. This poses a unique challenge for inspectors at contractor checkpoints as they attempt to verify the person's need for these items. The most common practice is to call for an airport security manager or LEO to interview the person, or call the person's supervisor to verify the need. This has the potential for inconsistencies that may be exploited by bad actors.

Typically, airports require contractors to be badged, especially if their work is expected to continue for several weeks or months. Technicians are often unbadged as they do not work full time at the airport. Construction contractors will sometimes use badged supervisors to escort the unbadged employees.

The following methods can be used to enhance contractor inspections.

5.5.1 Tool Tracking

Some contractors require special tools that would otherwise be considered prohibited items. By creating, or having the contractor create, a log of all the tools (prohibited or not) that they are bringing into the Sterile or Secured Area, inspectors can track what goes through the access portal and then can check the inventory log upon exit to ensure the contractor did not leave a tool behind.

A modification to this method is the use of barcodes affixed to the tools, which inspectors can scan using a barcode reader. The reader logs each tool into a database to track tools passing into the Sterile and Secured Areas. This reduces the time required for inspection and, depending on the volume of controlled tools, may be cost-effective. The downside to this method is the possibility of the barcode stickers being removed and stolen.

Another method that eliminates the possibility of fraud is to engrave identifiers into the tool. The identifiers could have the contractor's name, company name, or a system of digits. While this method is more secure, logging tools may take longer.

This method is commonly used to track restricted items in restaurants, such as knives needed for food preparation. A checklist containing a description of each restricted item is often kept at the

restaurant/concessions area for the manager to perform regular audits. An airport security manager may also carry a copy for audits performed daily, weekly, or monthly, depending on ASP requirements.

5.5.2 Exempt Tools

Some tools that would otherwise be considered prohibited items may be deemed exempt and allowed to pass through an access portal. Since inspectors are often required to call for authorization, or contractors are required to use the TSA checkpoint, having a pre-approved exemption log could save time during the inspection.

The log should list all relevant tools and the name of the contractor responsible for those tools. The inspector can check the tools being brought into the Sterile or Secured Areas against the exemption log to confirm authorization to carry. The log should have an option to log-in/log-out the tools.

The contractor's operational need for the item should be confirmed prior to placing them on the log. Typically, a supervisor, LEO, or FSD is responsible for determining this operational need.

Having the airport or another authority issue written licenses for the tools could provide another method of identifying and tracking exempt tools. Adding a picture of each tool would help eliminate confusion.

5.5.3 Dollies and Carts

Many vendors and concessionaires use dollies and wheeled carts to move boxes around the Sterile and Secured Areas. This equipment cannot pass through most inspection machines because it is usually large and made entirely of metal. The best method to inspect this equipment is to remove all items from the cart or dolly, and have the vendor or concessionaire lift the equipment for the inspector to check that nothing is hidden on the underside.

5.5.4 Trash and Recyclables

Most airports use large rolling bins to collect trash throughout the airport. However, these have the potential to create serious security risks, especially if the trash carts are being taken from the Public Area to the Sterile or Secured Area to be emptied in a trash compactor.

Most airports have solved this problem with two trash compactors: one located in the Public Area and one in the Sterile or Secured Area, and a separate set of Public Area and Sterile/Secured Area bins. This prevents the carts from passing from a less restricted area to a more restricted area.

However, some airports do not have the space or budget to support two compactors. These airports typically locate the trash compactor in the Public Area. Trash carts are taken from the Sterile and Secured Areas into the Public Area, which ensures the carts are passing from a more restricted area into a less restricted area.

5.5.5 Designated Portals

Some airports require contractors to use the TSA checkpoint with an authorized escort whereby TSA officers determine which tools may be brought into the Sterile Area. However, many airports have contractors use the same portals as the aviation workers.

Some airports have designated one of their vehicle portals for sole use by construction workers and construction vehicles. Designating a vehicle portal for this purpose removes construction-related traffic

from the other, more frequently used vehicle portals, and it allows inspectors at the other gates to concentrate on vehicles and people that will be traveling near aircraft and the occupied terminal areas.

Designating certain vehicle portals for special traffic during irregular operations, such as snowplows and deicing vehicles during inclement weather, will also help relieve traffic congestion at other vehicle portals during these operations. An additional benefit is that these vehicles often have time-sensitive schedules or contents, and separating them from the regular vehicle queue will allow them to get to their destination quicker.

This type of vehicle portal is most effective if paired with just-in-time inspections (Section 5.4.3) and/or a trusted concessionaire/tenant/contractor program (Section 6.1.5).

5.5.6 Scheduled Access

By creating specific blocks of time during which contractors are permitted access to the Sterile or Secured Area, the airport can station inspectors at the specified times and locations to ensure the contractors are inspected. Scheduling contractor jobs outside of flight operations or during off hours could help relieve traffic at the access portals as well as limit the contractors' access to passengers and airplanes, which also enhances airfield safety.

5.5.7 Construction Sites

Airports frequently sponsor construction projects in the terminal areas and surrounding airfields. Some airports have chosen to work with their FSD to designate the construction areas (otherwise within the AOA and certain parts of the Secured Area) as "Restricted" instead. The biggest benefit to this designation is that contractors working within the area are not required to be badged, or only the supervisors are badged.

SECTION 6: STAFFING APPROACHES

This section discusses different types of inspector staff, as well as approaches to creating the most effective and efficient schedule.

6.1 Inspectors

The following are the inspector staff airports currently use. Many airports use a combination of these staffing strategies to create a robust and effective staffing approach.

6.1.1 Airport Authority Inspectors

These are inspectors employed by the airport or airport authority (city, county, etc.) Using airport employees allows for better buy-in to the program for all badged people because it enhances the community policing culture (Section 7.2.2) by encouraging a "we are all in this together" mentality.

However, airport inspectors often have more responsibility than just inspections. If using just-in-time scheduling (Section 5.4.3) this can become burdensome for the inspectors.

6.1.2 Third-Party Contract Staff

In this situation the airport develops and manages the inspection program while a third-party contracted staff performs the inspections. This includes third-party dockmasters overseeing operations at a consolidated vendor facility (Section 5.3.1) or consolidated loading dock (Section 5.3.2).

Typically, the airport security manager oversees the contract or post orders for the contract staff, and ensures regular audits of their performance. Third-party inspectors are most often trained by their company to perform inspections as outlined in the airport's post orders, but some airports offer additional training for special circumstances. Airports should meet regularly with the third-party supervisor to discuss and reinforce the security posture of the airport and the inspectors' role in it.

Third-party guards may be cost-effective if airport employee overhead costs are high, or if inspection demand temporarily exceeds inspector capacity (e.g., increase in operations, or during construction). While the post orders may extend beyond inspections, using these "extra" personnel to perform inspections alleviates some of the workload that would normally fall to the operations and/or security staff by offering more flexibility in staffing and scheduling. However, smaller airports are unlikely to have enough badged personnel and vehicles using their access portals to warrant a third-party inspector.

The actual expense of employing guard staff will depend on how many guards are contracted, how many hours each of them work, and specific contract negotiations.

6.1.3 Law Enforcement Officers

LEOs are often used as inspectors at airports, especially at airports with a dedicated police force on the premises. There are several benefits to using LEOs to perform the inspections.

In many cases, airport staff and third-party contracted guard staff do not have the legal authority to conduct pat downs; only LEOs and TSA staff have that authority at their assigned airport. Additionally, the ability to search personal property may be limited to LEOs and TSA staff in certain cities or states.

In these circumstances, airports would need to assign LEOs to perform inspections on aviation worker personal property.

Uniformed LEOs also have influence that other inspection staff may not have. Some airports use sworn civilians instead of LEOs. These personnel usually have the ability to carry out any duties or responsibilities of a LEO (pat down, searches, etc.), but do not carry a firearm.

However, stationing LEOs to perform inspections takes them away from other security duties, including patrols. Airports using LEOs as their entire or part of the inspection staff should ensure a balance between inspections and the LEOs' other security responsibilities.

6.1.4 Canine Teams

Canine teams (Figure 6-1) are often considered to be the most effective method to detect explosive traces without invasive physical inspections (e.g., collecting swabs of an individual's hands or personal property). This is due to the dog's ability to recognize traces of explosives even in environments that contain hundreds of odors and moving people and objects.

Figure 6-1. Explosive Detective Canine in Training

Source: U.S. Air Force

The biggest benefit to using canine teams is that multiple parcels or individuals can be inspected quickly, reducing the overall inspection time without invading personal space.

However, canine teams have disadvantages. Canines are fallible, and have been known to miss traces and show false positives. Supporting canine teams with alternate detection methods, such as ETD and walk through detectors, helps mitigate these disadvantages.

Canines can only work for short periods, usually about 20 minutes, before they must take a break. However, the dogs can work longer if they are performing passive inspections instead of more active inspections, such as walking throughout a storage area instead of a vendor truck. Another way to help with canine fatigue is to deploy two teams at once. One team could perform active inspections while the other performs passive inspections, swapping duties every so often.

Canine teams are expensive to train and maintain, so it is possible that only larger airports will have the budget and a large enough population to justify the costs. The teams can be procured in a couple of ways. Perhaps the easiest way (but also the most cost prohibitive) is for the airport's governing body to purchase the canine team for the airport's use. Other options include using local police canine teams and TSA's canine teams. However, both of these rely on another entity providing the teams, and thus should not be the only inspection option at the airport.

6.1.5 Trusted Concessionaire/Tenant/Contractor

This is a designated employee from a concessionaire, tenant, or contractor who is authorized and trained to perform inspections without physical supervision.

At one airport, an authorized employee (typically a manager) from each concessionaire is trained to inspect the merchandise and consumables delivered by their vendors. The driver of the vendor vehicle

calls their trusted concessionaire contact to receive the delivery at the loading dock. Under the view of several security cameras, the trusted concessionaire inspects the merchandise and consumables according to the airport's policy, and moves the merchandise and consumables into a locked storage area.

Another airport created a position for a trusted contractor whose sole job function is to inspect construction vehicles and their driver and passenger(s) at a designated vehicle portal (see Section 5.1.1). This position is staffed by employees of the construction company.

In both instances, the trusted person has been fully vetted and badged. They have taken the same inspection training as the airports' "official" inspectors and undergo frequent testing to ensure consistency and compliance.

Both airports have seen positive results with this method. Before initiating the trusted concessionaire/ contractor method the airports were using just-in-time inspection schedules (Section 5.4.3), which pulled operations/security staff away from their tasks at unpredictable times. This method has relieved the operations/security staff to focus on their other responsibilities and performing inspections at the other access portals.

At airports using the TSA checkpoint to inspect merchandise and consumables, this method may relieve some of the congestion caused by the inspection process.

Airports considering this method must ensure that the trusted person is badged and vetted, and trained on the airport's inspection processes and procedures. Frequent testing and auditing will help ensure consistency and compliance. This should also include regular reviews of the inspection logs and/or reviews of the security footage.

Table 6-1 shows an example of the inspection log from an airport using trusted concessionaires to perform inspections.

Table 6-1. Example of a Simple Inspection Log

Date	Inspection Start Time	Inspector Initials	SIDA Badge Number	Type of Delivery	Notes/Prohibited Items & Quantities	I verify that the prohibited item is necessary for job performance

6.2 Randomizing Inspections

When resources are limited and access portals cannot be staffed full time, random inspections are the most effective option. Random inspections—when truly randomized—help aviation workers feel as though the inspection selection criteria is impartial and unbiased, which aids acceptance of the inspections within the aviation worker population. If the aviation workers feel that the inspections are targeting a certain subgroup (i.e., profiling) it will cause friction and potentially create legal backlash.

The frequency and locations of inspections will need approval from the airport's FSD.

6.2.1 Spreadsheet Randomizer

Using a spreadsheet, airports can create a simple randomizer to determine daily inspection schedules. Here is how to set up one quickly.

Figure 6-2. Step 1: Create List of Portals

	A	B
1	Portals	
2	A3	1
3	A12	2
4	B1	3
5	B17	4
6	C6	5
7	D8	6
8	D13	7
9		

Figure 6-3. Step 2: Create List Array

	A	B	C
1	Portals		
2	A3	1	1
3	A12	2	7
4	B1	3	
5	B17	4	
6	C6	5	
7	D8	6	
8	D13	7	
9			

Step 1: In the first column, list the access portals using whatever identifier makes sense for your airport. In the second column, number the portals as shown in Figure 6-2.

Step 2: In the third column, list 1 and below that the last number in your portal list. In our example, it would be 7 as shown in Figure 6-3. These two numbers are the array that will be used in the formula to create the randomized schedule.

Figure 6-4. Steps 3 & 4: Customize Inspector Times

	A	B	C
1	Portals		
2	A3	1	1
3	A12	2	7
4	B1	3	
5	B17	4	
6	C6	5	
7	D8	6	
8	D13	7	
9			
10		Portal	
11	0400-0600	=RANDBETWEEN(C2,C3)	
12	0600-0800		
13	0800-1000		
14	1000-1200		
15	1200-1400		
16	1400-1600		
17	1600-1800		
18	1800-2000		
19	2000-2200		
20			

Step 3: This step can be customized in several ways. In one column you could list the times of day during which the inspector should be present at the designated portal. Or, you could list days of the week for the inspector to be stationed at the portal. Customize this column as needed for your airport's operations. The example in Figure 6-4 shows inspection time blocks (A11:A19).

Step 4: Using our example, in cell B11 (Figure 6-4), write the formula =RANDBETWEEN(C2,C3). C2 refers to the number 1 that begins our array and C3 refers to the number 7 that ends our array. You should use whichever cells you placed your array numbers in, but be sure to include the $ symbol. Press enter to complete the formula and show your first random number.

Step 5: Drag the =RANDBETWEEN() formula down to all the cells next to the times of day. This will populate these cells with random numbers between 1 and 7, and provide you with a randomized schedule, as shown in Figure 6-5.

Note: Every time a cell is changed the spreadsheet will update and the random numbers will change. Some spreadsheet programs have the option to turn this feature off.

Figure 6-6. Step 5: Create Randomized Schedule

	A	B	C
1	Portals		
2	A3	1	1
3	A12	2	7
4	B1	3	
5	B17	4	
6	C6	5	
7	D8	6	
8	D13	7	
9			
10		Portal	
11	0400-0600	1	
12	0600-0800	5	
13	0800-1000	6	
14	1000-1200	1	
15	1200-1400	5	
16	1400-1600	6	
17	1600-1800	2	
18	1800-2000	3	
19	2000-2200	7	
20			

Figure 6-5. Step 6: Create Multifactor Randomness

	A	B	C	D	E	F
1	Portals			Feature		
2	A3	1	1	Red hat	1	1
3	A12	2	7	"A" in badge ID	2	5
4	B1	3		Laced shoes	3	
5	B17	4		Wearing glasses	4	
6	C6	5		Blue eyes	5	
7	D8	6				
8	D13	7				
9						
10		Portal	Feature			
11	0400-0600	1	4			
12	0600-0800	5	1			
13	0800-1000	6	5			
14	1000-1200	1	1			
15	1200-1400	5	1			
16	1400-1600	6	4			
17	1600-1800	2	4			
18	1800-2000	3	5			
19	2000-2200	7	2			
20						

Optional Step 6: Some airports use multiple factors to create even more randomization. If you would like to create a multifactor randomizer, you would only need to create more lists using steps 1–3 and repeating the =RANDBETWEEN() formula with the additional arrays. With our example in Figure 6-6, a list of five features has been added in column D. According to this randomly generated schedule, from 0400–0600, the inspector will be stationed at portal A3 and inspect every person wearing glasses. Be sure to evaluate the features you choose to ensure fairness and equality. For example, choosing to inspect every person wearing a blue shirt will bias your inspections toward companies that require a blue shirt as part of their uniform.

Optional Step 7: For a cleaner look to your finished schedule, you could use a lookup function to convert the random numbers back into the text they represent. With this function, cell B11 would say A3 instead of 1.

6.2.2 Work with ATLAS Teams

Many airports work closely with TSA to support ATLAS play operations (formerly known as the Playbook). The program is designed to provide employees with the expectation that they may be screened at any time, not just when they pass through an access portal. Of the 117 airports that are required to conduct plays, 85 have dedicated staff to support play operations.

If an ATLAS team is performing plays at an airport, it would be beneficial for that airport and the TSA to work together to staff complementary portals. For instance, if the ATLAS team is stationed at Gates 1 and 5, airport inspectors could staff Gates 2 and 3, or could staff portals at different times to create more inspection periods at more access portals. ATLAS teams are not stationed at all airports, so this would only be of use to airports with this TSA support.

SECTION 7: TRAINING METHODS

This section discusses methods to train the inspectors and badged population on the inspection program. It also discusses methods to create a security-conscious culture by communicating security initiatives with the badged population.

Development of aviation workers' security awareness should be supported by the existing training, violation, and incentive programs in order to grow the overall airport security culture.

More information on badge holder training considerations and strategies can be found in Section 5 of PARAS 0020: *Strategies for Effective Airport Identification Media Accountability and Control*, which is available at www.sskies.org/paras/reports/.

7.1 Training and Evaluation

Most airports are training their inspectors on how to perform inspections, but are not training the aviation workers on the inspection program. Airports mainly rely on the SIDA training required of all badged individuals and the paperwork read and signed during the badging process.

However, training the individuals on the airport's security processes and protocols creates a more educated and informed population.

7.1.1 Job-Specific Training

Offering or requiring additional training for specific jobs or badge-type holders, such as drivers or escorts, ensures those people know what is required and expected of them, but avoids requiring unnecessary training for the general population.

Job-specific courses can include driving, escorting, tool maintenance, merchandise and consumable inspections for trusted concessionaires/tenants/contractors (Section 6.1.5), and badge challenging.

7.1.2 Specialized Training

LEOs, TSA, and industry organizations, may offer short courses and demonstrations with the purpose of creating a security-conscious airport population. Some courses that may be beneficial are suspicious behavior identification training, IED and explosives recognition training, active shooter training, and hazardous materials recognition training. These courses and demonstrations will help increase the situational awareness of everyone who attends, and reaffirms why their participation in the overall security of the airport is so important. Positions that would benefit the most from this specialized training are the ones assigned to perform inspections.

Suspicious behavior identification training might be the most useful to inspectors and would enable them to identify situations that may need law enforcement intervention. This training would teach individuals how to identify suspicious behavior and individuals avoiding decision points (such as staffed inspection locations) and establish environmental baselines. This training often teaches how to actively engage in conversations while asking security-related questions, because physical screening is incapable of determining a person's motivations, attitudes, and capability to cause harm.

At least one airport requires all of its aviation workers to complete behavior detection training before they are assigned a badge.

7.1.3 Program Testing/Auditing

Audits are important for ensuring the effectiveness and compliance of an inspection program. Audits can include test questions, deploying undercover personnel, Red Teams, incentive games, and pop quizzes administered to the inspectors on a random basis.

For inspectors, the audit is often a Red Team or decoy system in which a fake weapon or a colored box is placed among vendor goods or personal property (with full consent of the individual who will be passing through the access portal). If the decoy item is discovered, the inspector passes the test. If it is not discovered, the inspector is informed of their mistake and the situation is treated as a learning opportunity. Resulting training should encourage inspectors to focus on a methodical inspection instead of processing the queue, which will result in more thorough and effective inspections.

Some third-party contract staff use an independent reviewer to audit their staff's compliance with post orders. This is a requirement for contract guard forces that have or are seeking SAFETY Act Designation or Certification.

7.1.4 Regular Retraining

Retraining of badge holders is a good time to reinforce security initiatives and badge holder responsibility. Typically, retraining is required as part of the badge renewal process or as a consequence of a security violation. However, airports could require more frequent retraining of their badge holders or encourage more specialized training (Section 7.1.2).

Frequent retraining reminds the badged population of the responsibility they accept as a badge holder, and can provide a refresher on some of the policies or situations that are not commonly encountered. The retraining programs can be enhanced by incorporating additional information on security responsibilities, security awareness, and how to report suspicious activity.

7.2 Communication

Regularly engaging with the aviation worker community raises the awareness of security measures at the airport, and threats at the local and national levels, and also reminds aviation workers to maintain a security-oriented awareness of the environment in which they work.

More information on stakeholder communication can be found in Section 6 of PARAS 0020: *Strategies for Effective Airport Identification Media Accountability and Control*, which is available at www.sskies.org/paras/reports/.

7.2.1 Regular Security Meetings

Regular security meetings allow airports to discuss security matters with airport stakeholders. The meetings can be held weekly, monthly, or quarterly, depending on the availability of the majority of stakeholders. Topics can include general security topics, pressing airport-related security issues, and urgent national or local security issues. Discussions allow the stakeholders to express any concerns or ask questions in a semi-public forum, which promotes a community policing culture (see the next section).

The Intelligence and National Security Alliance (INSA) Insider Threat roadmap offers several tips for training and communicating with employees about insider threat. INSA suggests developing short videos or PowerPoint presentations that highlight specific security concerns and can be played on displays in the employee areas. They also suggest hanging posters and flyers or newsletters in areas

where employees spend time, such as breakrooms, freight elevators, and employee buses. The organization also suggests developing small items such as pens, mouse pads, mugs, or other giveaways with a security tip or message printed on them (Section 7.2.4).

7.2.2 Community Policing

Community policing is traditionally a combination of programs that police departments implement to better align a department's resources with its community's needs. It involves listening through formal and informal processes to what the community is requesting, and then developing the programs required to meet those needs. Community policing policies in airports can engage the entire airport community and raise awareness of the indicators for non-compliant behaviors, terrorism, and crime.

This is an excellent strategy for all airport sizes, and is very effective because it is based on implicit, mutual respect between the airport and the aviation workers. The principle behind the strategy is that everyone is equally responsible for the security of the airport. By policing each other, the community can limit or remove the idea of a "Big Brother" watching every move, and rely on getting to know each other's habits and behaviors, and asking questions if something seems out of place. Creating an environment in which they feel comfortable reporting suspicious activity without repercussion is a major step to a security-conscious population.

There are several federal tip lines created for individuals to report suspicious behaviors or activities:

- The Department of State's Rewards for Justice Program (rewardsforjustice.net, 1-800-US REWARD, info@rewardsforjustice.net) – established in 1984, the program's goal is "to bring international terrorists to justice and prevent acts of international terrorism against U.S. persons or property."
- The DHS's If You See Something, Say Something Campaign (https://www.dhs.gov/see-something-say-something, call 9-1-1 or local law enforcement) – established in 2010, the program's intent is to improve situational awareness and encourage threat activity reporting.
- The TSA's This Is My Airport Program (844-MY-ARPRT) – established in 2015, the program was created to re-emphasize the DHS's If You See Something, Say Something Campaign by "promoting security awareness and vigilance throughout the aviation community."

A similar, local program designed specifically for an airport's aviation workers population would enhance the overall security of the airport by promoting security awareness. In most cases, the community policing culture encourages individuals to report suspicious behavior instead of confronting them.

Many airports with community policing indicate that the culture hinges on employees getting to know individuals in their work areas. Often, this means stationing the same inspector at a portal so that the inspector can identify when someone is not following their usual routine. However, it should be noted that this method of scheduling may present issues with inspector fatigue and over familiarity; see Section 3.2.4 for more details.

Challenge programs also encourage the badged population to make note of co-worker routines, and empowers individuals to report those acting outside of their usual behavior. It encourages group accountability for the good of the entire airport.

There are other ways to promote a community policing culture. At some airports, especially the smaller ones, personnel are permitted to return prohibited items to their vehicles (see Section 3.3.2) as part of

their community policing culture, allowing the airport to appear sympathetic to simple mistakes. This would not apply to more serious items such as knives (those not needed to perform job functions) or pepper spray.

Some airports use the buddy system, which requires that every individual in the Secured Area or in other designated areas have a "buddy" or partner. This keeps each individual accountable for themselves, but also provides some accountability for their partner while maintaining an amiable community policing culture.

7.2.3 Share Threat Intelligence

The key to a risk-based security approach is the continual assessment of the vulnerabilities and gaps in security at the airport within the context of the local, regional, and national threat environment. This allows the airport to adjust its security posture as necessary and in a timely fashion.

There are a few ways to find this information. Work with your local TSA representative and police department to receive intelligence updates on national, regional, state, and local issues and threats. Hold discussions with other airport security managers to share intelligence at the local and regional level.

This intelligence sharing is a good opportunity to reassess whether adjustments to security resources (staff, equipment, etc.) is necessary to reinforce other areas. It is important that, when receiving pertinent intelligence, all stakeholders are engaged, including tenants, concessionaires, contractors, and other local airports who may benefit from the information.

For instance, the information received may indicate that more inspections need to be conducted, or that ETD (more in Section 3.5.7) needs to be added to the inspection process. It could also allow an airport to inform its inspectors to be on high alert for certain items and be more aware of suspicious or abnormal behaviors. Aviation workers could be encouraged to conduct more badge challenges. This could be a good opportunity to implement incentive programs (Section 9.2.2) and branded giveaways (Section 7.2.4) to promote security awareness.

7.2.4 Branded Giveaways

Giveaways can be an effective method to literally put an airport's security message in the aviation worker's hands and promote security awareness in the aviation worker community. The items could be pens, lanyards, lapel pins, or other small items featuring a security slogan such as the name of the airport's challenge program and a phone number to report suspicious behavior. The items provide simple ways to engage aviation workers and remind them of their responsibility as a badge holder. Pens, lapel pins, and lanyards are especially useful because they can be carried with or worn by the aviation workers during work hours for quick reference.

The items can be given away as an incentive for successfully challenging another aviation worker in the SIDA who is not displaying their badge, or it can be given as part of a security initiative. See Section 9.2.1 for more information about challenge programs.

There is an obvious cost associated with designing and producing the giveaways, but buying the items in bulk will usually make the program more affordable.

Figure 7-1. Example of a Branded Giveaway

Source (modified): promoexcitement.com

SECTION 8: DOCUMENTATION AND ANALYSIS

This section discusses various documentation and analysis methods to aid in compliance, efficiency, and decision making.

8.1 Documentation

Documentation is an important part of any airport process. Whether written or digital, documentation helps to ensure compliance with guidelines and procedures, facilitate more efficient processes, and establish data points necessary to make informed decisions.

8.1.1 Written SOPs

Having written SOPs facilitates standardized training for inspectors, as well as fair and equal treatment of individuals being inspected. Written SOPs also allow airports to audit observed practices against documented processes to identify opportunities for improvement.

Not many airports have written SOPs for inspections; or, if they do, they are in the form of post orders for third-party contract inspectors. Creating these documents, even if only using a process outline or general terms, will help ensure consistency throughout the inspection process.

These documents should be continuously reviewed and updated as necessary to reflect any changed requirements or conditions.

8.1.2 Digital Logs

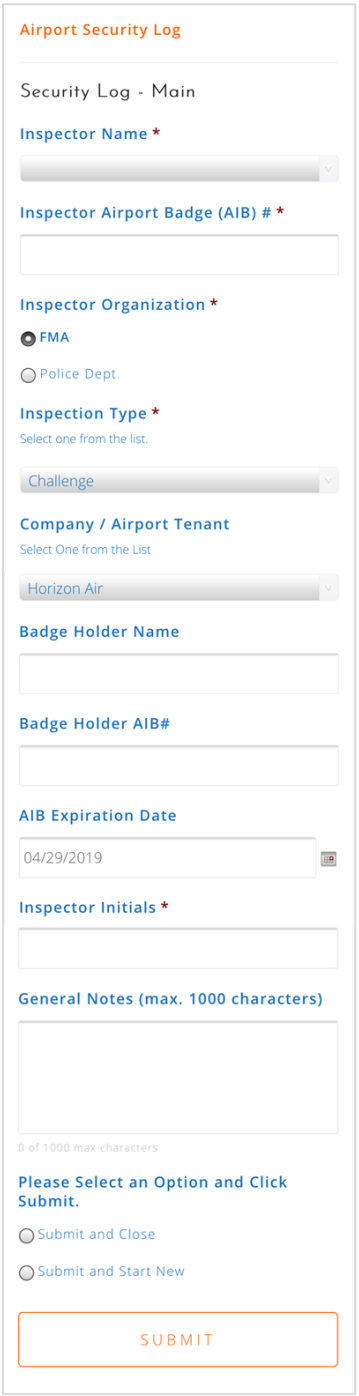
Most airports keep logs of their inspections. Digital logs allow airports to quickly collect and analyze inspection data. These logs can be as simple as a spreadsheet or as complex as a custom-built mobile application. The data collected can be analyzed (manually or using analytic software) to identify trends and provide easy-to-read summaries.

Depending on the type of data recorded, digital storage may present cost challenges, especially if information laws in the airport's state or other regulations require long retention periods.

Figure 8-1 shows a screenshot of a mobile application currently being used to collect inspection information at an airport. This application was custom built for the airport for a one-time fee. The airport pays a monthly subscription fee to maintain access to the application.

The information gathered in this application generates several reports, which the airport uses to track trends and audit their inspectors. More information on auditing can be found in Section 7.1.3, Program Testing/Auditing.

Figure 8-1. Example of a Mobile Inspection Application



8.1.3 Tool Inventory Logs

Concessionaires often have prohibited items in their space to perform their jobs, such as knives, screwdrivers, etc. Most airports have each concessionaire create an inventory log of all their tools that is checked at least once a day (but more often twice a day) by the concessionaire or a security manager.

Additionally, some contractors require special tools that would otherwise be considered prohibited items. By creating a log of all the tools (prohibited or not) that they are bringing into the Sterile or Secured Area, inspectors can track what goes through the access portal and then can check the inventory log upon exit to ensure the contractor did not leave a tool behind. Having a pre-approved exemption log may also save time during inspections. More information can be found in Tool Tracking (Section 5.5.1) and Exempt Tools (Section 5.5.2).

8.1.4 Video Analytics

Video analytic software, in addition to being an excellent real-time surveillance tool, can be an effective way to document an individual's movement throughout the airport. Some systems allow the recorded footage to be forensically analyzed to track people or vehicles based on distinguishing features, such as the color of the vehicle or an individual's clothes, across hours of footage and multiple cameras.

The cost of deploying video analytics is often high. Costs may include upgrading or adding cameras, training operators to use the software, and integrating new technology and hardware with existing systems such as access control and emergency dispatch. Additionally, digital storage is expensive, and airports residing in states that require longer retention periods may require more storage space.

Creating an environment that is conducive to reliable video documentation requires thoughtful camera placement, high camera resolution, and adequate lighting. This is especially important to consider if installing cameras for video analytics outside. Keep in mind that multiple camera fields of view overlapping within the same area may be required to improve the data's usability.

8.1.5 Establishing Breadcrumbs

This is a method used to identify and track noncompliant aviation workers. Airports create these "breadcrumbs" or time stamps in several ways, but they require the use of the CCTV system or access control system.

For instance, in a case where someone swipes their badge, enters their PIN, opens the door, sees that officers are present, and then opts not to enter (i.e., tries to avoid inspection), one of the officers would go to the access control card reader outside the door and swipe their own badge. This establishes a "breadcrumb" such that the access logs can be pulled and the badge swiped immediately before the inspector's will identify the employee who attempted to avoid the inspection.

Similarly, if someone attempts to piggyback (enter while the door is open after another employee has swiped and entered their PIN), the officer may move into the field of view of local CCTV cameras and wave to establish a visual "breadcrumb" that can be used (along with an estimated time of day) to aid in identifying the would-be violator.

8.2 Analysis

These are methods for collecting and analyzing access and inspection data to make informed operational and procurement decisions. In some cases, an auditor and/or additional staff positions may need to be created to review and analyze the data.

8.2.1 Cost Analysis

The prioritization of any of the potential inspection methods discussed in this report requires a careful consideration and comparison of benefits versus disadvantages. Any methods under serious consideration need to reduce the time needed to perform the task, improve security effectiveness, or improve operational efficiencies enough to offset the anticipated costs.

In a risk-based approach, security gaps and vulnerabilities need to be individually assessed to define potential threats and the consequences of that threat being realized. Once this assessment is complete, the risks can be prioritized to determine the most effective and efficient solutions and use of resources. Other factors to consider are:

- Availability of capital
- Competing projects
- Privacy, safety, and legal issues
- Environmental concerns
- Continuity of operations and business constraints
- Federal, state, local, tribal, and/or military regulations

This approach requires the airport to conduct continual risk assessments to determine gaps or weak areas in their security posture, and then selectively target these areas for improvement. A cost analysis should be performed as part of this prioritization process. More information on risk assessment and prioritization can be found in PARAS 0016: *Airport Security Vulnerability Assessments* (anticipated publication in May 2020).

When conducting a cost analysis—especially when analyzing the viability of procuring and deploying new technology and equipment—the total life cycle costs and impacts to airport operations should be carefully considered. Other cost considerations include costs for regular maintenance, technology support, repairs, spare parts, and software license updates.

Airports should also consider competing proposals among multiple vendors and manufacturers. This will likely require significant research and discussions with the vendors and manufacturers. Developing a request for information (RFI) or request for qualifications (RFQ) has the benefit of eliminating some of the research required on the part of the airport. It is important that airports releasing such requests clearly state **what** the product or service needs to accomplish, not necessarily **how** it will be accomplished or what the product or service will **look** like. Information received in response to an RFI or RFQ allows the airport to create a request for proposals (RFP) that is more likely to result in a solution that meets their needs.

8.2.2 Technology Pilots

Working with manufacturers and vendors to run pilots before beginning formal procurement could help ensure the equipment and/or technology works within operations and is up to standards.

Safe Skies performs pilot-type projects under their ASSIST program, which provides for testing of biometrics, access control, and perimeter security technologies at Safe Skies' facilities and US commercial airports. These projects are designed to enable airports to see how commercial technologies perform in their unique environment and conditions to aid in procurement decisions. For more information on this program, visit www.sskies.org/assist.

8.2.3 Metrics

Most airports are already collecting information from their inspections, whether from manual logs, digital logs, or swipe logs in the access control system. These metrics can be used as part of a cost analysis (Section 8.2.1) to justify funding additional resources, such as more inspectors or new equipment. They can also help identify trends to better target deployment of inspectors and reveal opportunities for process improvement.

Performing throughput studies, which track the number of individuals passing through an area by time of day, or time-and-motion studies, which determine the length of time it takes to perform individual tasks, can help make informed decisions such as determining optimum staffing schedules or reconfiguring equipment, people, or processes. These studies can be facilitated by video analytics applications designed for queue management, which can analyze trends in peak portal usage and track queuing times.

Badge swipe logs can be useful to help schedule random screening, by stationing inspectors at the most used portals during the highest traffic times.

One key consideration is to review the data often to reassess trends.

8.2.4 Assess Access

Airports should occasionally review access control logs to determine which access portals are being used by employees of each vendor/tenant/concessionaire, and limit access to these portals to those employees whose job requires the access. The most common example of this is air carrier employees who only need access to the doors in terminals serving their employer.

Additionally, some jobs may require that the employee only have access to the Secured or Sterile Area during specific times of day, such as allowing maintenance personnel access to offices in the Sterile Area only during flight operations hours. Access for these employees could be limited to the times required to perform their job.

SECTION 9: VIOLATION AND CHALLENGE PROGRAMS

Violation and challenge programs are important aspects of an airport's inspection program. They offer punishments for negative behaviors and rewards for positive behaviors. Both are necessary for a balanced enforcement of the inspection program.

9.1 Violation Programs

Violation programs are required of airports by the TSA, although the specific means of enforcing notices of violations is ultimately up to the individual airport based on their state and local laws.

The "Big 6" violations used at many airports are:

1. Loaning or borrowing another's badge
2. Allowing unauthorized individuals or vehicles into the Secured Area, Sterile Area, or Controlled Areas (piggybacking and tailgating)
3. Blocking or damaging doors, gates, or card readers, or leaving access doors or gates open
4. Bypassing, eluding, or evading the security system (including inspections)
5. Altering an airport badge
6. Interfering or noncompliance with inspections, security procedures, or security personnel

Some airports add bringing prohibited items or weapons into the Secured Area, Sterile Area, or other controlled areas.

TSA recommends creating a policy that would revoke the badge of an aviation worker refusing to submit to inspection or attempting to circumvent an inspection.

More information on general enforcement considerations and penalty structures can be found in Section 7 of PARAS 0020: *Strategies for Effective Airport Identification Media Accountability and Control*, which is available at www.sskies.org/paras/reports/.

9.1.1 Tiered System with Fines

A tiered system of violations provides the airport the ability to assign increasing consequences for repeated or additional security violations. Often this is a progressive structure that can include suspension of badge access, SIDA retraining, fines, and revocation of badge privileges, which typically results in loss of income for the aviation worker.

For example, the first time an aviation worker receives a notice of violation they may have their badge suspended and have mandatory SIDA retraining. The second time may result in a longer suspension, and the third may result in complete badge revocation.

Some airports categorize different violation types into different levels. For instance, the first incident of bringing a prohibited item may be treated differently than the first incident of piggybacking.

Regardless of whether the system is progressive or offense-categorized, airports typically have the following tiered system: Level One is most often a 24 to 72-hour badge suspension with a refresher SIDA training. Level Two is often a 48 to 168-hour badge suspension with refresher training. Level Three most often results in badge revocation. Some airports also require the aviation worker's supervisor or manager to attend refresher training after the second violation.

Many airports also have a monetary fine system in place, which has been shown to decrease the number of repeat offenses. This is something that needs to be worked out with the airport's owner (airport authority, city, county, etc.) and the airport's legal department, as certain state and local laws prohibit monetary consequences. Airports that have implemented a fine system have seen a significant reduction in repeat violations. The fines range from $25–$200 for the first offense to $250–$1,000 for the third offense. Often these fines are assessed to the aviation worker, but occasionally the employer is responsible for the fine. TSA is almost always called in to investigate and potentially open a formal case, which may result in civil penalties, especially at airports without a fine system in place. Another option is to have the aviation worker pay a badge reactivation fee.

9.1.2 Badge Point System

Some airports use a point system, similar to a traffic point system, in which reaching a certain number of points will require the badge to be revoked. Each type of violation has a defined number of points assigned to it, and accruing a specific number of points within a certain period results in consequences such as retraining, badge suspension/revocation, or a fine. More significant violations incur more points, but repeated minor violations also lead to increased consequences.

9.2 Challenge Programs

All airports are required to have a challenge program. However, airports are not required to maintain an incentive program to go with that challenge program. In fact, many airports do not have an incentive program, citing a limited budget as the biggest reason. Below are methods for implementing an effective challenge program and an associated incentive program.

9.2.1 Challenge Program

Challenge programs encourage aviation workers to challenge others who are not displaying their badge correctly or have violated a security measure (such as piggybacking). The program calls for the challenger to report violations to the operations center or other point of contact.

49 CFR § 1542.211 requires all airports to "establish and carry out a challenge program… The challenge program must include procedures to challenge individuals not displaying airport approved identification media." The challenger should verify that the ID is a true representation of the individual, is displayed properly, allows for access in the area the individual is currently inside, and has not expired.

To test the aviation worker population, the tester will often remove or conceal their badges as they walk around the Secured Area. It is the aviation worker's responsibility to point out that the other individual's badge is missing or concealed. If the tester is successfully challenged, the aviation worker may be rewarded as part of an incentive program (see next section). Failure to challenge typically results in a reminder to the aviation worker of their responsibility to challenge.

Using color-coded badges (Section 2.3) and large, obvious icons (Section 2.4) may help aviation workers identify if someone is authorized to be in an area or performing a duty without needing to approach that individual.

Some airports use challenge cards (Figure 9-1) to encourage aviation workers to perform badge challenges. This is a laminated card that can be attached to a lanyard or clip and is provided when the badge is issued to the aviation worker. The card describes how to perform a badge challenge and provides a phone number to call to report suspicious activity.

Figure 9-1. Example of a Challenge Card

9.2.2 Incentive Program

An incentive program offers the challenger a reason to report and challenge more regularly. Such incentives are often of monetary value, such as gift cards or vouchers to airport concessionaires and entries into a lottery for larger monetary values. Not all airports have the budget to give out gift cards, and some state or local laws prevent the airport from using money as an incentive. Other options may include awarding a "challenge coin" (Figure 9-2), reserved parking spots for a certain period, or recognition and a certificate during a stakeholder meeting.

Figure 9-2. Example of a Challenge Coin

SECTION 10: SUMMARY OF METHODS

This section summarizes the methods discussed in Sections 1–9 to provide a quick description of each method and its potential application within the airport environment. Table 10-1 presents the following information:

- Category – the major focus of the described methods; corresponds with document levels 1 and 2 section headers
- Method – corresponds with document level 3 headers; note that several methods are repeated due to multiple locations and inspection types they can be used with
- Type – categorizes each method as one of five types:
  - Facility – the method adds or modifies physical areas and assets
  - Technology – the method deploys or upgrades technology or equipment
  - Policies & Procedures – the method implements policies or procedures
  - People – the method utilizes human resources
  - Other – the method does not fit into any other category
- Purpose – describes the reason for the method as one of four categories:
  - Inform – guides decisions
  - Deter – discourages negative or unwanted behaviors
  - Detect – enables more immediate detection of prohibited items
  - Review – provides a record in the case of an incident or audit
- Used for – indicates the method's intended target of application;
- Section – a link to the full method description in the document
- Summary – a brief overview of the method

Table 10-1. Summary of All Methods

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
ACCESS CONTROL METHODS	Total Badging	Policies & Procedures	Deter	AW	2.1	Badging everyone who works at the airport, regardless of whether they work in a restricted area, gives the airport the ability to perform background checks and random inspections on these people because they have consented as part of their badge application, and they have the expectation that they may be inspected.
	Picture Renewal	Policies & Procedures	Deter Detect	AW	2.2	Requiring all badged personnel to update their ID picture when their badge is renewed keeps pictures more current, and helps inspectors quickly identify whether the person wearing the badge is the same as the person in the picture.
	Color Coded Badges	Policies & Procedures	Inform Deter Detect	AW	2.3	Color designations for badge types enable aviation workers and inspectors to quickly identify workers who are authorized to be in certain areas without needing to get close enough to read the badge. This method extends to aviation workers who are only allowed in the Public Area.
	Obvious and Distinct Icons	Policies & Procedures	Inform Deter Detect	AW	2.4	Badge icons or stickers that are large or otherwise obvious enable aviation workers and inspectors to determine a person's authority to escort, drive, or perform other privileged tasks without the need to approach that person too closely.
	Distinct Uniforms	Policies & Procedures	Inform Deter Detect	AW	2.5	Providing personnel with distinct uniforms enables other workers and inspectors to quickly identify whether someone is authorized to be in an area without the need to approach that person too closely.
AVIATION WORKERS/ ESCORTED	Biometrics	Technology	Deter Review	AW	3.1.1	This offers authentication to access portals in addition to badges alone, which can be stolen or used without authorization. Fingerprints are the most commonly used biometric token.

[2] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
PEOPLE INSPECTIONS: TECHNOLOGY AND EQUIPMENT	Mobile Card Readers and Fingerprint Scanners	Technology	Inform Deter Review	AW	3.1.2	This technology is useful for performing random inspections of aviation workers in the Sterile and Secured Areas.
	Detection at Range	Technology	Inform Deter Detect	AW PP C	3.1.3	This technology uses passive terahertz radiation to detect concealed items on a person as they walk through an area. It is fast and non-intrusive to the person being checked, and mitigates the person's need to divest or stop for an extended period.
	Handheld Metal Detectors	Technology	Inform Deter Detect	AW C	3.1.4	These are a practical option for airports with a limited budget. They only detect metallic items and have a learning curve to use properly and effectively.
	Walk-Through Metal Detectors	Technology	Inform Deter Detect	AW C	3.1.5	Walk-through detection equipment offers a fast and non-intrusive method to check for metallic, non-metallic, and certain prohibited items.
	ETD Machines	Technology	Deter Detect	AW PP C	3.1.6	These devices are designed to quickly and accurately detect minute traces of explosives in a sample gathered from a person or object.
AVIATION WORKERS/ ESCORTED PEOPLE INSPECTIONS: INSPECTION POLICIES	Temporary/Visitor Pass	Policies & Procedures	Inform Deter Detect	AW	3.2.1	Issuing a temporary or visitor pass to individuals who need to be escorted into the Sterile and Secured Areas will easily identify them as a non-aviation worker. Visitors can be checked against TSA's Secure Flight, internal violation database, and other restriction lists.
	Inspectors Swipe Badges	Policies & Procedures People	Deter Detect	AW	3.2.2	This is a simple method where the inspector visually inspects and swipes the badge of the aviation worker passing through a portal to ensure each badge is valid and to prevent piggybacking.
	Portal Curfews	Policies & Procedures	Deter Detect	AW PP C	3.2.3	When the TSA checkpoint closes or flight operations stop, some airports require that aviation workers, vendors, and contractors use only specific access portals to pass between the Public, Sterile, and Secured Areas.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
	Rotate Inspectors	Policies & Procedures People	Inform Deter Detect	AW PP V M/C C	3.2.4	Inspectors should be rotated by either assigning them for a few hours at one location and then moving them to another location/duty during their shift, or assigning them to different portals each shift. This increases overall coverage and decreases predictability.
	Full Employee Inspections	Policies & Procedures	Deter Detect	AW PP M/C C	3.2.5	While an inspector is stationed at an access portal, every person that passes through the portal is inspected each time they pass through the portal.
	Continuous Random Inspections	Policies and Procedures	Deter Detect	AW PP	3.2.6	The inspector pulls aside the first person to arrive at a portal to be inspected. While that inspection is being performed, other aviation workers may pass through the portal as normal. When that inspection is complete, the inspector stops the next person to arrive at the portal.
AVIATION WORKERS/ ESCORTED PEOPLE INSPECTIONS: PORTAL LOCATIONS	TSA Checkpoint	Facility	Deter Detect	AW PP	3.3.1	This method reduces the number of inspections that need to be performed by the airport, but it also puts more pressure on the checkpoint, and is viewed by passengers as a poor level of service.
	Non-Traditional Locations	Facility	Deter Detect	AW PP M/C C	3.3.2	Establishing inspection points in non-traditional locations—such as employee parking lots or employee bus/tram stops within the terminal—can provide the airport with a method to inspect aviation workers and contractors before arriving at the terminal or SIDA, while also potentially relieving backups that can occur at inspection points in the terminal or SIDA.
	Reduced Number of Portals	Policies and Procedures Facility	Deter	AW PP M/C C	3.3.3	There is a standing recommendation from ASAC and TSA to reduce the overall number of access portals to restricted areas. Continuously reassessing the operational need for portals and deactivating portals as appropriate will enhance the overall security of the airport.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
	Future Portals	Facility	Inform	AW PP M/C C	3.3.4	When undergoing construction, airports can use the design phase to ensure that new portals are large enough to accommodate future inspection technology and equipment. It is always possible that new regulations will require new technology. Planning for that eventuality during the design phase will help alleviate issues in the future.
	Blind Presentations	Policies & Procedures Facility	Deter Detect	AW PP M/C	3.3.5	This involves stationing the inspectors behind a partition so that an aviation worker is not aware that inspections are taking place at that portal before they have committed to using it.
AVIATION WORKERS/ ESCORTED PEOPLE INSPECTIONS: PORTAL TYPES	Turnstile Access Portals	Facility	Deter Detect	AW PP M/C C	3.4.1	Turnstiles nearly eliminate the problem of piggybacking and are ideal for outdoor installations. They are common at airport access portals leading from the Sterile to Secured Area and the Public to Secured Area.
	Sally-Port Style Portals	Facility	Deter Detect	AW PP C	3.4.2	These are hallways with two sets of access portals that must have a badge swiped to pass. The first gate closes behind the employee, essentially trapping the employee in the space between the two portals. Airports can station inspectors inside the hallway to prevent employees from bypassing inspections.
AVIATION WORKERS/ ESCORTED PEOPLE INSPECTIONS: PERSONAL PROPERTY INSPECTION TECHNOLOGY	Flashlights and Sticks	Technology	Detect	PP	3.5.1	These allow for a visual check of the contents of a bag without the inspector needing to empty the bag or place their hands inside.
	Toolkit for Inspectors	Technology	Deter Detect	AW PP V M/C C	3.5.2	An inspection toolkit ensures that the inspector has what they need to perform their duties.
	X-Ray Machines	Technology	Deter Detect	PP	3.5.3	X-ray machines offer a non-intrusive means of inspecting personal property and tools.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
	Lighting and CCTV	Technology	Detect Review	AW PP	3.5.4	Upgrading the lighting at terminal portals provides better illumination for CCTV cameras and gives inspectors better visibility when inspecting badges and personal property.
	Action and Body Cameras	Technology	Deter Review	AW PP V M/C C	3.5.5	These are small cameras designed to be mounted anywhere to capture action shots. When used by inspectors, they can offer audio and video evidence in case of an inspection violation or claim of improper behavior by an inspector.
	CT Machines	Technology	Deter Detect	PP	3.5.6	CT machines provide three-dimensional images of bag contents, similar to an x-ray machine, but also provide explosives detection capabilities.
	ETD Machines	Technology	Deter Detect	PP V M/C	3.5.7	These devices are designed to quickly and accurately detect minute traces of explosives in a sample gathered from a person or object.
AVIATION WORKERS/ ESCORTED PEOPLE INSPECTIONS: PERSONAL PROPERTY INSPECTION POLICIES	Prohibited Items and Exemptions	Policies & Procedures	Deter	PP C	3.6.1	Posting a prohibited items list for aviation workers may reduce the frequency of discovered prohibited items, and shows that the airport has a consistent expectation of the inspection process.
	Restrict Bags	Policies & Procedures	Deter Detect	PP	3.6.2	This method limits the number and/or size of bags that are allowed into restricted areas in order to reduce the number of bags that need to be inspected as they pass through an access portal.
	Return to Vehicle	Policies & Procedures	Deter	PP	3.6.3	This allows badged personnel to return prohibited items to their personal vehicle without consequence.
	Amnesty Boxes	Policies & Procedures	Deter	PP	3.6.4	These are secured boxes, placed near an access portal, where badged personnel can surrender their forgotten prohibited items without consequence.
	Coat/Jacket Inspections	Policies & Procedures	Deter Detect	AW PP	3.6.5	Requiring aviation workers, vendors, and contractors to remove their coats and jackets and send them through an x-ray machine, or open them for visual inspection allows the inspectors to see if the person is concealing an item underneath.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
	Secured Tool Storage	Policies & Procudures Facility	Deter	PP	3.6.6	By maintaining inventoried tools of the trade in the restricted area, aviation workers and contractors will not need to bring tool bags through the access portals. This also allows the airport to audit the tool inventory at any time.
AVIATION WORKERS/ ESCORTED PEOPLE INSPECTIONS: VEHICLE INSPECTIONS: TECHNOLOGY & EQUIPMENT	RFID Tags	Technology	Inform Deter Detect	V	4.1.1	Assigning RFID tags to vehicles allows the airport to track vehicles in a similar manner to a badge for a person. Using a mounted or handheld RFID reader, the tag can be scanned to ensure that the vehicle is permitted in the Secured Area and that it has no flags or alerts.
	Undercarriage Mirrors	Technology	Detect	V	4.1.2	These assist vehicle inspectors in looking under the vehicle for IEDs or other suspicious items.
	UVIS	Technology	Detect	V	4.1.3	These are camera systems that are used to look under a vehicle. The image or video is then sent to a monitor for the inspector to review. Some UVIS include intelligent software that identifies anomalies based on previous scans of the same or a similar vehicle.
	Overhead Mirrors	Technology	Detect	V	4.1.4	These mirrors are mounted on poles and provide inspectors with a view of open-top vehicles, such as trucks used at construction sites and garbage trucks.
	Overhead Cameras	Technology	Detect	V	4.1.5	Like overhead mirrors, these cameras enable overhead viewing of open-top vehicles, but also provide zoom and recording capabilities.
	License Plate Readers	Technology	Detect Review	V	4.1.6	This type of system uses a camera and software to read a vehicle's license plate and compare it to a list of approved or denied vehicle plates.
	Upgrade Lighting	Technology	Detect Review	V M/C	4.1.7	Upgrading the lighting at vehicle portals gives inspectors better visibility when inspecting vehicles, badges, and driver's licenses.
	Inspection Flags	Technology	Inform Deter Detect	V M/C C	4.1.8	These are flags or other objects that can be temporarily placed on the dashboard to indicate that the vehicle has been inspected.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
	Wireless/Mobile Card Readers	Technology	Deter Detect	AW	4.1.9	The inspector can pass this type of card reader to the driver and passengers so they do not have to exit the vehicle.
VEHICLE INSPECTIONS: PORTAL TYPES	Sally-Port Style Portals	Facility	Deter Detect	V C	4.2.1	These are areas with two sets of gates or barriers. A vehicle typically passes through the first gate with a badge verification. The first gate then closes behind the vehicle, trapping the vehicle in the space between the two gates, before the second gate opens.
	Sheltered Guard Stations	Facility	Deter	AW V C	4.2.2	Sheltered guard stations at vehicle gates provides inspectors with a place to store tools and equipment, and to shelter from the weather. This helps them to maintain focus on the inspection task.
VEHICLE INSPECTIONS: INSPECTION POLICIES	Full Vehicle Inspections	Policies & Procedures	Deter Detect	V M/C C	4.3.1	While an inspector is stationed at a vehicle access portal, every vehicle and its occupants are inspected each time they pass through the portal.
	Continuous Random Inspections	Policies & Procedures	Deter Detect	V C	4.3.2	The inspector pulls aside the first vehicle to arrive at a portal to be inspected. While that inspection is being performed, other vehicles may pass through the portal. When that inspection is complete, the inspector stops the next vehicle to pass through the portal.
	Temporary Access Portals	Policies & Procedures Facility	Deter Detect	V M/C C	4.3.3	This method temporarily converts the exit lane at a vehicle access portal into an additional entrance lane when the number of vehicles to be inspected has significantly increased.
	Driver Opens Compartments	Policies & Procedures	Detect	V	4.3.4	For this method, the driver of the vehicle is responsible for opening compartments such as the glove compartment and trunk. This protects the inspector from injury or being accused of planting prohibited items, and enables the inspector to monitor both the vehicle and the driver at all times.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
	Driver Exits Vehicle	Policies & Procedures	Deter Detect	V C	4.3.5	This method allows inspectors to visually inspect the interior of a vehicle without the driver's body obscuring or concealing items and compartments.
	Driver and Passenger Inspections	Policies & Procedures	Deter Detect	AW C	4.3.6	All of the methods for inspection of an aviation worker or escorted person can be applied to a vehicle driver and passengers. The inspector should log the driver's and passengers' identification information before releasing any escorted persons into the Secured Area.
VENDOR/ CONTRACTOR & MERCHANDISE/ CONSUMABLES INSPECTIONS: VEHICLE INSPECTION POLICIES	Designated Vehicle Portals	Policies & Procedures Facility	Deter Detect	V M/C	5.1.1	Designating a specific vehicle portal for use by vendors removes vendor-related traffic from the other vehicle portals, and allows inspectors at the other gates to concentrate on vehicles and people that will be traveling near aircraft and terminal areas.
	Tamper-Evident Seals	Policies & Procedures Technology	Deter Detect	V M/C C	5.1.2	Airports and vendors could set up an agreement under which trusted vendors inspect their own merchandise and consumables while loading the delivery vehicle, seal the vehicle with uniquely identified seals, and notify the guards or concessionaire receiving the shipment of the identifier. If the seal shows signs of tampering with or a different identifier, the receiver can refuse the shipment or inspect the vehicle based on the agreement between the parties.
	Driver and Vehicle Authorized Lists	Policies & Procedures	Inform Deter Detect	V C	5.1.3	For this method, the airport would require the vendor/contractor to provide driver names and driver's license numbers in advance, as well as all vehicle license plate numbers for vehicles that will be driving at the airport.
	Aisle Walkway	Policies & Procedures	Deter Detect	V M/C	5.3.4	This is an aisle in the delivery truck that enables the inspector to access the full length of the cargo area and visually inspect each pallet, cart, or box.
VENDOR/ CONTRACTOR &	X-Ray Machines	Technology	Deter Detect	M/C	5.2.1	X-ray machines offer a non-intrusive means of inspecting merchandise and consumables.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
MERCHANDISE/ CONSUMABLES INSPECTIONS: TECHNOLOGY AND EQUIPMENT	EMIS	Technology	Deter Detect	M/C	5.2.2	These are devices specifically used to detect metals in boxes and containers, and are useful when inspecting certain types of merchandise and consumables.
	ETD Machines	Technology	Deter Detect	PP V M/C	5.2.3	These devices are designed to quickly and accurately detect minute traces of explosives in a sample gathered from a person or object.
	CT Machines	Technology	Deter Detect	M/C	5.2.4	CT machines provide three-dimensional images of container contents, similar to an x-ray machine, but also provide explosive detection capabilities not offered by x-ray.
	Pulsed Fast Neutron Analysis	Technology	Deter Detect	M/C	5.2.5	These devices are used at some cargo facilities to scan large items such as boxes on pallets. The technology produces images similar to an x-ray, but can differentiate between metals, organics, plastics, and other materials.
	Inspection Stickers, Stamps, and Tags	Technology	Inform Deter Detect Review	V M/C	5.2.6	These are inspection labels used to indicate containers or vehicles that have been inspected by the airport's designated inspector at a previous time and location.
VENDOR/ CONTRACTOR & MERCHANDISE/ CONSUMABLES INSPECTIONS: LOCATIONS	Consolidated Vendor Facility	Facility	Deter Detect	V M/C	5.3.1	This is a secured facility where all merchandise and consumables are received, inspected, and temporarily stored before delivery to the terminal concessionaires/tenants.
	Consolidated Loading Dock	Facility	Deter Detect	M/C	5.3.2	This is an area where merchandise and consumables are delivered and inspected before being delivered to secured storage or the terminal area concessionaires/tenants.
	TSA Checkpoint	Facility	Deter Detect	M/C C	5.3.3	This method reduces the number of inspections that need to be performed by the airport, but it also puts more pressure on the checkpoint, and is viewed by passengers as a poor level of service.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
VENDOR/ CONTRACTOR & MERCHANDISE/ CONSUMABLES INSPECTIONS: SCHEDULE	Specific-Hour Access	Policies & Procedures	Deter Detect	V M/C C	5.4.1	By turning off access to certain portals during specific times of day, an airport can direct individuals and vehicles through designated portals where inspectors could be stationed.
	Scheduled Vendors	Policies & Procedures	Deter Detect	V M/C	5.4.2	By creating specific blocks of time during which concessionaires can receive deliveries, the airport can station inspectors at those times and locations to ensure all the deliveries are inspected, without having to staff the locations at all times.
	Just-in-Time Inspections	Policies & Procedures	Deter Detect	V M/C C	5.4.3	Using this method, vendors delivering merchandise and consumables call to request an inspector when they reach the access portal, if one is not already stationed at that location. For airports that do not receive deliveries often, this can be an effective way to utilize a limited number of inspectors.
VENDOR/ CONTRACTOR & MERCHANDISE/ CONSUMABLES INSPECTIONS: CONTRACTOR INSPECTIONS	Tool Tracking	Policies & Procedures	Deter Detect Review	PP C	5.5.1	By creating a log of all the tools each contractor is bringing into the Sterile or Secured Area, inspectors can track what goes through the access portal, and then can check the inventory log on exit to ensure the contractor did not leave a tool in a restricted area.
	Exempt Tools	Policies & Procedures	Detect Review	PP C	5.5.2	This log tracks all tools, otherwise considered prohibited items, that pass through the access portal, and the contractors who bring in the tools.
	Dollies and Carts	Policies & Procedures	Deter Detect	C	5.5.3	This method has the vendor or concessionaire lift dollies and carts for the inspector to check that nothing is hidden on the underside.
	Trash and Recyclables	Policies & Procedures	Deter Detect	C	5.5.4	This method uses either two trash compactors (one in the Public Area and one in the Sterile/Secured Area) or just one in the Public Area to avoid the carts passing from a less secure area to a more secure area.
	Designated Portals	Policies & Procedures Facility	Deter Detect	AW PP	5.5.5	Designating certain vehicle portals for special traffic during irregular operations (weather, construction,

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
				V M/C C		etc.) can help relieve traffic congestion at other portals during these operations.
	Scheduled Access	Policies & Procedures	Deter Detect	PP C	5.5.6	By turning off access to certain portals during specific times of day, an airport can direct contractors and vehicles to designated access portals where inspectors could be stationed.
	Construction Sites	Policies & Procedures Facility	Deter Detect	V C	5.5.7	This method requires airports to work with their FSD to designate the construction areas within the AOA and certain parts of the Secured Area as "Restricted."
STAFFING APPROACHES: INSPECTORS	Airport Authority Inspectors	People	Deter Detect	AW PP V M/C C	6.1.1	These are inspectors employed by the airport or airport authority (city, county, etc.)
	Third-Party Contract Staff	People	Deter Detect	AW PP V M/C C	6.1.2	This is a contracted guard force used to perform inspections and alleviate some of the workload that would normally fall to the operations and/or security staff.
	LEOs	People	Deter Detect	AW PP V M/C C	6.1.3	LEOs have a uniform influence that other inspection staff may not have, as well as the authority to conduct pat downs.
	Canine Teams	People	Deter Detect	AW PP V M/C C	6.1.4	Canine teams are often considered to be the most effective method to detect explosives without invasive physical inspections. They can inspect multiple parcels or individuals quickly, reducing the overall inspection time.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
	Trusted Concessionaire/ Tenant/Contractor	People	Deter Detect	AW PP V M/C C	6.1.5	This is a designated employee from a concessionaire, tenant, or contractor who is authorized and trained to perform inspections of their company's own merchandise and consumables, vehicles, and/or employees without direct physical supervision.
STAFFING APPROACHES: RANDOMIZING INSPECTORS	Spreadsheet Randomizer	Policies & Procedures	Inform Deter	AW PP V M/C C	6.2.1	This is a simple tool that can be created quickly in Excel using built-in formulas and functions to generate random lists of inspection variables, such as which portals to staff, what times to conduct inspections, or which person or vehicle to inspect in a group.
	Work with ATLAS Teams	Policies & Procedures	Inform Deter	AW PP V M/C C	6.2.2	If an ATLAS team is performing plays at an airport, it would be beneficial for that airport and the TSA to work together to staff complementary portals or to staff portals at different times to create more inspection periods at more access portals.
TRAINING METHODS: TRAINING & EVALUATION	Job-Specific Training	Policies & Procedures	Inform Deter Review	AW	7.1.1	Offering or requiring additional training for specific jobs or badge types, such as drivers or escorts, ensures those people know what is required and expected of them, but avoids requiring unnecessary training for the general population.
	Specialized Training	Policies & Procedures	Inform Deter Detect	AW	7.1.2	Requiring certain aviation workers to take short courses and demonstrations with LEOs, TSA, and industry organizations has the benefit of creating a more safety-conscious and situationally aware airport population.
	Program Testing/ Auditing	Policies & Procedures	Inform Deter Detect Review	AW PP V M/C C	7.1.3	Regular testing and auditing of inspectors enables the airport to monitor the inspectors' effectiveness and correct mistakes.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
	Regular Retraining	Policies & Procedures	Inform Deter Review	AW	7.1.4	Frequent retraining reminds the badged population of the responsibility they accept as a badge holder, and can act as a refresher for some of the policies or situations that are not as commonly encountered.
TRAINING METHODS: COMMUNICATION	Regular Security Meetings	Policies & Procedures	Inform	AW	7.2.1	These allow airports to discuss security matters with airport stakeholders. Topics can include general security topics, pressing airport-related security issues, and urgent national or local security issues.
	Community Policing	Policies & Procedures	Deter Detect	AW	7.2.2	The community policing principle dictates that everyone is responsible for the security of the airport. It creates a culture of security that increases the likelihood that aviation workers will report suspicious activities and behavior.
	Share Threat Intelligence	Policies & Procedures	Inform	AW	7.2.3	Sharing local, regional, and national threat intelligence with stakeholders allows the airport to adjust its security posture as necessary and in a timely fashion.
	Branded Giveaways	Policies & Procedures	Inform Deter	AW	7.2.4	These are small, branded items such as pens, mouse pads, or mugs that depict security tips or slogans.
DOCUMENTATION & ANALYSIS: DOCUMENTATION	Written SOPs	Policies & Procedures	Inform Review	AW PP V M/C C	8.1.1	Written SOPs establish common guidelines and also enable airports to audit observed practices against documented processes to identify opportunities for improvement.
	Digital Logs	Policies & Procedures Technology	Review	AW PP V M/C C	8.1.2	Digital logs enable airports to quickly collect and analyze inspection data. The data collected can be analyzed (manually or using analytic software) to identify trends and provide easy-to-read summaries.
	Tool Inventory Logs	Policies & Procedures	Inform Deter	PP C	8.1.3	With this method, each concessionaire creates an inventory log of all their tools that is checked at least

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
			Detect Review			once a day by the concessionaire or a security manager.
	Video Analytics	Technology	Inform Deter Reivew	AW PP V M/C C	8.1.4	Some video analytic software enable recorded footage to be forensically analyzed to track people or vehicles based on distinguishing features (e.g., clothing color, vehicle type) across hours of footage and multiple cameras.
	Establishing Breadcrumbs	Policies & Procedures	Inform Review	AW V C	8.1.5	Airports create “breadcrumbs” or time stamps using the CCTV or access control system.
DOCUMENTATION & ANALYSIS: ANALYSIS	Cost Analysis	Policies & Procedures	Inform	AW PP V M/C C	8.2.1	This method requires the airport to conduct continual risk assessments to determine gaps or weak areas in their security posture, and then selectively target these areas for improvement.
	Technology Pilots	Other	Inform		8.2.2	Piloting technologies before beginning procurement helps ensure the equipment works to expected standards.
	Metrics	Policies & Procedures	Inform Deter	AW PP V M/C C	8.2.3	Metrics can be used to justify funding additional resources, such as more inspectors or updated equipment. They can also help identify trends to inform deployment of inspectors and reveal opportunities for process improvement.
	Assess Access	Policies & Procedures	Inform Deter	AW V C	8.2.4	Regularly review access logs to determine which access portals are being used by employees of each vendor/tenant/concessionaire and limit access to these portals to those employees whose job requires the access.
VIOLATION & CHALLENGE PROGRAMS:	Tiered System with Fines	Policies & Procedures	Deter	AW	9.1.1	A tiered system of violations provides the airport the ability to assign increasing consequences for repeated or additional badge violations.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

CATEGORY	METHOD	TYPE	PURPOSE	USED FOR[2]	SECTION	SUMMARY
VIOLATION PROGRAMS	Badge Point System	Policies & Procedures	Inform Deter	AW	9.1.2	This is similar to the points system on a driver's license. Violations have a defined number of points assigned to them, and accruing a specific number of points within a certain period results in consequences.
VIOLATION & CHALLENGE PROGRAMS: CHALLENGE PROGRAMS	Challenge Program	Policies & Procedures	Inform Deter Detect	AW	9.2.1	Challenge programs encourage badge holders to challenge others who are not displaying their badge correctly or have violated a security measure.
	Incentive Program	Policies & Procedures	Inform Deter Detect	AW	9.2.2	An incentive program offers the challenger the potential to be rewarded for reporting an issue or challenging others more frequently.

[1] USED FOR column key: **AW:** Aviation Workers, **PP:** Personal Property, **V:** Vehicles, **M/C:** Merchandise/Consumables, **C:** Contractors

REFERENCES

"100 Percent Air Cargo Screening: Remaining Steps to Secure Passenger Aircraft", *Subcommittee on Transportation Security and Infrastructure Protection.* (2010).

"A Review of Access Control Measures at Our Nation's Airports", Subcommittee on Transportation Security of the Committee on Homeland Security, (2015).

"A Review of Access Control Measures at Our Nation's Airports*", Subcommittee on Transportation Security of the Committee on Homeland Security*, (2015). (Statement of Kathleen Rice).

"A Review of Access Control Measures at Our Nation's Airports", *Subcommittee on Transportation Security of the Committee on Homeland Security*, (2015). (Statement of Michael McCaul).

"A Review of Access Control Measures at Our Nation's Airports", *Subcommittee on Transportation Security of the Committee on Homeland Security*, (2015). (Statement of Bennie Thompson).

"A Review of Access Control Measures at Our Nation's Airports", *Subcommittee on Transportation Security of the Committee on Homeland Security*, (2015). (Statement of Mark Hatfield).

"A Review of Access Control Measures at Our Nation's Airports", *Subcommittee on Transportation Security of the Committee on Homeland Security*, (2015). (Statement of G. Doug Perdue).

"A Review of Access Control Measures at Our Nation's Airports", *Subcommittee on Transportation Security of the Committee on Homeland Security*, (2015). (Statement of Kevin Burke).

"A Review of Access Control Measures at Our Nation's Airports", *Subcommittee on Transportation Security of the Committee on Homeland Security*, (2015). (Statement of Miguel Southwell).

"A Review of Access Control Measures at Our Nation's Airports", *Subcommittee on Transportation Security of the Committee on Homeland Security*, (2015). (Statement of Sharon Pinkerton).

"A Review of Access Control Measures at Our Nation's Airports", *Subcommittee on Transportation Security of the Committee on Homeland Security*, (2015). (Statement of Steven Grossman).

Air Cargo Security Requirements, 71 Fed. Reg. 30477 (codified at 49 CFR §§ 1520, 1540, 1542, 1544, 1546, 1548)

Airport Security, 49 C.F.R. §1542.

Aircraft Operator Security: Air Carriers and Commercial Operators, 49 CFR § 1544.

Aviation Security Advisory Committee Working Group on Airport Access Control. Final Report of the Aviation Security Advisory Committee's Working Group on Airport Access Control. (2015).

Aviation Transportation System Security Plan: Supporting Plan to the National Strategy for Aviation Security. (2007).

Balakrishnan, Balaji. *Insider Threat Mitigation Guidance.* SANS Institute. (2015).

Beckman, Lori, Gloria Bender, and Rex Roe. Secure Transfer of Goods into Sterile Areas Process Identification Test Report. (2010).

Black, Alan. Managing the aviation insider threat. Calhoun. (2012).

Blanc, John, Jr. Research Study on Access Control and Trust: Preventing the Recurrence of a Snowden-Like Incident." Capella University. (2015).

Boden, Eric and Dave Dickerson. "Employee Screening Takes on New Capabilities." (2007).

Charlotte Douglas International Airport. *Aviation Security Handbook*. (2017).

Chawal, Ukesh. "Game Theory and Its Applications." (2019).

Command, Control and Interoperability Center for Advanced Data Analysis. Best Practices in Anti-Terrorism Security for Sporting and Entertainment Venues Resource Guide. (2013).

Denver Municipal Airport System. Denver Municipal Airport System Rules and Regulations Part 20. (2018).

Department of Homeland Security. *Air Cargo Security Requirements*. Fed. Reg. Vol. 71, No. 102, 26 May 2006.

Department of Homeland Security Office of Intelligence and Analysis. *Insider Threat to Utilities*. (2011).

Department of Homeland Security. *Patron Screening Best Practices Guide.* (2016).

Department of Homeland Security. Sports Venue Bag Search Procedures Guide. (2012).

Department of Homeland Security. *Vehicle Inspection Guide*. (2012).

Digital Barriers. Facial Recognition SmartVis Face Mobile. (2017).

Dombroff, Mark. "'Forward-Facing': Could facial recognition turn back the clock on the U.S. airport experience." *AirportBusiness*. June/July 2019.

Elias, Bart. "Risk-based Approaches to Airline Passenger Screening." *Congressional Research Service*. (2014).

Elias, Bart. "Screening and Securing Air Cargo: Background and Issues for Congress." *Congressional Research Service.* (2010).

Elias, Bart. "Security of Air Cargo Shipments, Operations, and Facilities." *Congressional Research Service.* (2018).

"Emerging Technology." Transportation Security Administration, https://www.tsa.gov/travel/security-screening/emerging-technology.

Evolv Technology. "Case Study: Evolv Screening Technology at Oakland International Airport." (2018).

"Examining Critical Security Measures, Communications, and Response at Our Nation's Airports", Subcommittee on Transportation Security of the Committee of Homeland Security, (2015) (Statement of Marisa Maola).

FAA Extension, Safety, and Security Act of 2016. Pub. L. 114-190. 130 Stat. 615. 15 Jul 2016.

Flamenbaum, Harold, Dave Fleet, Ross Gaisor, and Zach Varwig. PARAS 0006 Synthesis: *Employee Inspections Synthesis Report.* (2017).

Garrett, Ronnie. "Miami Int'l Adds New Layers to Employee Screening Checkpoint." *Airport Improvement.* July/Aug 2017.

Genetec. "Agent Vi Enhances Security and Safety at Montreal's Convention Center". (2013).

Genetec. "Agent Vi Helps RTAF Detect and Alert to Persons in Aircraft-Only Zones". (2010).

Genetec. "Agent Vi's innoVi Helps Remote Guarding Station, Eyeforce, to Detect Intruders, Prevent Damage and Losses". (2018).

Genetec. "Agent Vi Protects Large, Remote Solar Farms Against Intrusion and Theft". (2012).

Genetec. "Agent Vi Resolves Safety and Security Challenges at Green Bay Austin Straubel International Airport, USA". (2017).

Homeland Security Committee. (2017). America's Airports: The Threat from Within.

"Horizon Air After Action Briefing". *Airports at Work*, 2 April 2019.

Hughes, Ryan. "Tampa International Airport unveils new food distribution center." *WFLA.* 15 February 2016.

Information Circular 1501-E.

"Innovative Applications for Security". *Airports at Work*, 2 April 2019.

Insider Threat Integrated Process Team. Final Report on DoD Insider Threat Mitigation.

"Insider Threats to Aviation Security: Airline and Airport Perspectives", Subcommittee on Transportation and Protective Security of the Committee on Homeland Security, U.S. House of Representatives, (2018). (Statement of Captain Tim Canoll).

"Insider Threats to Aviation Security: Airline and Airport Perspectives", Subcommittee on Transportation and Protective Security of the Committee on Homeland Security, U.S. House of Representatives, (2018). (Statement of Lauren Beyer).

"Insider Threats to Aviation Security: Airline and Airport Perspectives", Subcommittee on Transportation and Protective Security of the Committee on Homeland Security, U.S. House of Representatives, (2018). (Statement of Stephen Alterman). PARAS 001: Employee/Vendor Physical Inspection Program Guidance.

"Insider Threats to Aviation Security: Airline and Airport Perspectives", Subcommittee on Transportation and Protective Security of the Committee on Homeland Security, U.S. House of Representatives, (2018). (Statement of Wendy Reiter).

International Atomic Energy Agency and American Nuclear Society. *International Topical Meeting on Nuclear Research Applications and Utilization of Accelerators*. Book of Abstracts. Vienna, Austria. 4-8 May 2009.

Kravitz, Derek and Ashley Halsey III. "U.S. tightening air cargo security." *Washington Post.* 9 November 2010.

Lampert, Allison. "U.S., Europe split over U.N. efforts to expand airport employee screening: sources." *Reuters*. 6 September 2019.

Level, Dave. "Proposed Anchorage airport warehouse could help cargo operations." *KTVA 11*. November 2018.

LexisNexis. Best Practices for Employment Screening. (2009). White Paper.

Mills, Robert, Michael Grimaila, Gilbert Peterson, and Jonathan Butts. *A Scenario-Based Approach to Mitigating the Insider Threat.* Information Systems Security Association, Inc. (2011).

Nelson, Nicole. "Atlanta Int'l Takes Aim at Insider Threats with Full Employee Screening." *Airport Improvement.* Nov/Dec 2015.

Office of Inspector General. Transportation Security Administration Has Taken Steps to Address the Insider Threat but Challenges Remain. (OIG Publication No. 12-120). (2012).

Office of Inspector General. *Transportation Security Administration's Known Shipper Program*. (OIG Publication No. 09-35). (2009).

Office of Inspector General. Transportation Security Administration's Oversight of Passenger Aircraft Cargo Security Faces Significant Challenges. (OIG Publication No. 07-57). (2007).

Office of Inspector General. TSA's Security Screening Procedures for Employees at Orlando International Airport and the Feasibility of 100 Percent Employee Screening. (OIG Publication No. 09-05).

Ong, Ta-Hsuan, Geoff Geurtsen, Jude Kelley, Alla Ostrinskaya, and Roderick Kunz. *Mass Spectrometry Vapor Analysis for Improving Explosives Detection Canine Proficiency.* (2008).

Osborne, Charlie. "Oakland follows San Francisco's lead in banning facial recognition tech." *ZDNet*. 19 July 2019.

Pacific Northwest National Laboratory. "Explosives vapor detection technology: the new "sniff test"." (2013). PARAS 001: *Employee/Vendor Physical Inspection Program Guidance.*

PatriotOne Technologies. *PATSCAN CMR Data Sheet.* (2015).

Petrie, Joe. "An Eye on Biometrics." *AirportBusiness*. June/July 2019.

Poole, Robert. "Toward risk-based aviation security policy." *Joint Transport Research Center.* (2008).

Port of Seattle. Schedule of Rules and Regulations No. 5. (2015).

"PS&S Steering Group Meeting". *Airports at Work,* 1 April 2019.

Rewards for SIDA Challenge. AAAE Member Hub. [Forum]. (9 April 2019).

Ritchey, Diane. "Employee Screening Boosts Security at Miami Airport." *Security*. July 2015.

Rules and Regulations of the Columbus Regional Airport Authority. 18 March 2019.

Sahito, Farhan Hyder and Wolfgang Slany. “Advanced Personnel Vetting Techniques in Critical Multi-Tennant Hosted Computing Environments”. *International Journal of Advanced Computer Science and Applications*, Vol. 04, No. 05. (2013). PARAS 001: *Employee/Vendor Physical Inspection Program Guidance.*

Salt Lake City Department of Airports. “Gate Guard Procedures.” (2015).

Security Directive 1542-01-07M. (2003).

Security Directive 1542-01-07O/P series.

Security Directive 1542-01-F/G/H series. (2013).

Security Directive 1542-04-08H/I/J series. (2015).

Security Directive 1542-06-01I. (2015).

Silk, Robert. “Oakland Airport deploys new screening tech to fight internal threats”. *Travel Weekly*. 20 March 2019.

Smiths Detection. “The Insider Threat: Gaps in Airport Employee Screening.”

Songer, Dave. “5 Minutes With…Mike Ellenbogen, CEO at Evolv Technology.” *Transport Security World.* (2019).

Standards for Airport Security Access Control Systems. RTCA, Inc, RTCA DO 2301. (2018).

Steven Baldwin Associates. Options to TSA Security: Is Private Security Screening Right for Your Airport? (2015).

Thruvision. “Improving Airport Security Using Stand-Off Passive Terahertz People Screening Technology”.

TranSecure, Inc. PARAS 0004: Recommended Security Guidelines for Airport Planning, Design and Construction. (2017).

Transportation Security Administration. “Prepare for Takeoff: Prohibited Items List.” (2009).

Transportation Security Administration. “TSA Air Cargo Security.” *The International Air Cargo Association.* (2008).

United States. Cong. House. 115th Cong. 1st sess. *Aviation Employee Screening and Security Enhancement Act of 2017.* H.R. 876. Washington: GPO, 2017.

United States. Cong. Senate. 115th Cong. 2nd sess. *Air Cargo Security Improvement Act of 2018.* H.R. 4176. Washington: GPO, 2018.

U.S. House of Representatives. Committee on Science, Space, and Technology. *Behavioral Science and Security: Evaluating TSA’s Spot Program.* (6 April 2011) 112th Congress. 1st sess.

U.S. House of Representatives. Homeland Security Committee. “A Review of Access Control Measures at Our Nation’s Airports, Part II.” (2015). (Statement by Melvin Carraway).

U.S. House of Representatives. Homeland Security Committee. "A Review of Access Control Measures at Our Nation's Airports, Part II." (2015). (Statement by Steve Grossman).

U.S. House of Representatives. Homeland Security Committee. "A Review of Access Control Measures at Our Nation's Airports, Part II." (2015). (Statement by Jeanne Olivier).

Weagle, Stephanie. "Overcoming the Challenges of Airport Surveillance Security." *AirportBusiness*. April 2019.

Explosive Materials

Item	Carry-on	Checked
Blasting Caps	No	No
Dynamite	No	No
Fireworks	No	No
Flares (in any form)	No	No
Hand Grenades	No	No
Plastic Explosives	No	No
Realistic Replicas of Explosives	No	No

Flammable Items

Item	Carry-on	Checked
Aerosols - Are prohibited with the exception of personal care items or toiletries in limited quantities	No	No
Fuels - Cooking fuels and any flammable liquid fuel is prohibited.	No	No
Gasoline	No	No
Gas Torches	No	No
Lighters - Lighters without fuel are permitted in checked baggage. Lighters with fuel are prohibited in checked baggage, unless they adhere to the Department of Transportation (DOT) exemption, which allows up to two fueled lighters if properly enclosed in a DOT approved case. If you are uncertain your lighter is prohibited, please leave it at home.	Yes	No
Lighter Fluid	No	No
Torch Lighters - These items create a thin, needle-like flame that is hotter (reaching 2,500 degrees Fahrenheit) and more intense than those from common lighters. Torch lighters are often used for pipes and cigars, and maintain a consistent stream of air-propelled fire regardless of the angle at which it is held. Torch lighters are prohibited.	No	No
Strike-anywhere Matches	No	No
Safety Matches - Only 1 book of safety (non-strike anywhere) matches are permitted as carry-on items.	Yes	No
Flammable Paints	No	No
Turpentine and Paint Thinner	No	No
Realistic Replicas of Incendiaries	No	No

NOTE: There are other hazardous materials that are regulated by the FAA. For more information visit faa.gov.

Disabling Chemicals & Other Dangerous Items

Item	Carry-on	Checked
Chlorine for Pools and Spas	No	No
Carbon Dioxide Cylinders in a Self-Inflating Life Jacket- Up to 2 in life vests and 2 spares. The spares must accompany the life vests and be presented as one unit.	Yes	Yes
Fire Extinguishers and other Compressed Gas Cylinders	No	No
Liquid Bleach	No	No
Recreational oxygen - (non-medically required, flavored or	No	No
Spillable Batteries - Except those in wheelchairs	No	No
Spray Paint	No	No
Tear Gas - Self-defense sprays containing more than 2% by mass of Tear Gas is prohibited in both checked bag and checkpoint.	No	No

NOTE: There are other hazardous materials that are regulated by the FAA. This information is summarized at faa.gov.

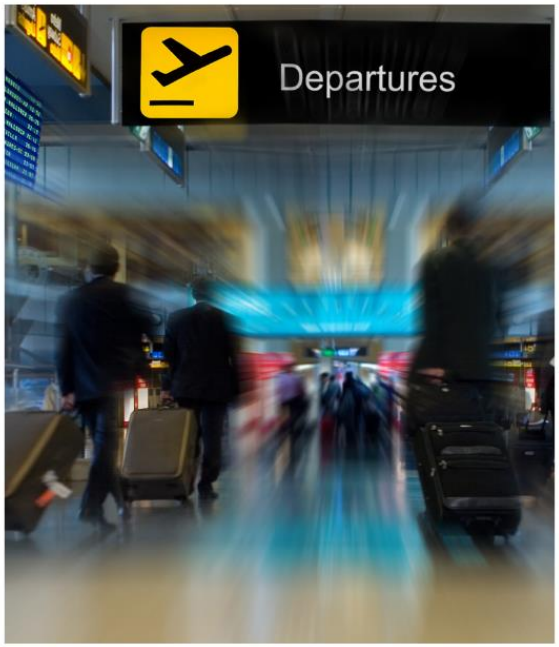
Other Items

Item	Carry-on	Checked
Gel-type Candles	No	Yes
Non-Flammable Liquid, Gel, or Aerosol (3.4 oz./100.55 ml or less that fit in one, clear, plastic, quart-sized, resealable bag)	Yes	Yes
Flammable Liquid, Gel, or Aerosol	No	No
Snow Globes (unless otherwise prohibited)**	Yes	Yes

*Screening procedures are governed by federal law and designed to detect threats to aviation security. TSA officers do not search for marijuana or other drugs; however, if an item is found that may violate federal law during security screening, TSA will refer the matter to law enforcement. Whether or not marijuana is considered medical marijuana federal law provides no basis to treat medical marijuana differently than non-medical marijuana.

**Snow globes that appear to contain less than 3.4 ounces (approximately tennis ball size) will be permitted if the entire snow globe, including the base, is able to fit in the same one clear, plastic, quart-sized, re-sealable bag, as the passenger's other liquids, such as shampoo, toothpaste and cosmetics.

*** Illegal controlled substances: TSA's screening procedures, which are governed by federal law, are focused on security and are designed to detect potential threats to aviation and passengers. As has always been the case, if during the security screening procedures an officer discovers an item that may violate federal law, TSA refers the matter to law enforcement. Law enforcement officials will determine if further action is appropriate.



Prepare for Takeoff

TSA's Prohibited Items List

Transportation Security Administration

tsa.gov

TSA Prohibited Items List

The TSA Prohibited Items List is not intended to be all-inclusive and is updated as necessary. To ensure a traveler's security, Transportation Security Officers (TSOs) may determine that an item not on the Prohibited Items List is prohibited.

The final decision rests with TSA on whether to allow any items through security checkpoints.

Travelers are encouraged to check with their airline or travel agent for policies as individual airlines may place additional restrictions on any item.

Please note that some items are illegal in certain states and will be subject to state laws. It is the traveler's responsibility to be aware of state laws in both origination and destination cities.

Please pay careful attention to the "NOTE" included at the bottom of each section – they contain important information about restrictions and exceptions.

Sharp Objects

Item	Carry-on	Checked
Box Cutters	No	Yes
Ice Axes/Ice Picks	No	Yes
Knives - Except for plastic or round bladed butter knives	No	Yes
Meat Cleavers	No	Yes
Razor-Type Blades - Box cutters, razor blades not in a cartridge (excluding safety razors) are prohibited in carry-on.	No	Yes
Sabers	No	Yes
Scissors - Metal with pointed tips and a blade length greater than four inches measured from the fulcrum	No	Yes
Swords	No	Yes

NOTE: Any sharp objects in checked baggage should be sheathed or securely wrapped to prevent injury to baggage handlers and Transportation Security Officers.

Sporting Goods

Item	Carry-on	Checked
Baseball Bats	No	Yes
Bows and Arrows	No	Yes
Cricket Bats	No	Yes
Golf Clubs	No	Yes
Hockey Sticks	No	Yes

Sporting Goods - Continued

Item	Carry-on	Checked
Lacrosse Sticks	No	Yes
Pool Cues	No	Yes
Ski Poles	No	Yes
Spear Guns	No	Yes
Tennis Rackets	Yes	Yes

Guns & Firearms

Item	Carry-on	Checked
Ammunition - Check with your airline if permitted in checked baggage. Small arms ammunitions for personal use must be securely packed in fiber, wood or metal boxes or other packaging specifically designed to carry small amounts of ammunition. Ask about limitations or fees.	No	Yes
BB Guns	No	Yes
Compressed Air Guns - Including paintball markers, may be carried in checked luggage without compressed air cylinder attached	No	Yes
Firearms - Firearms carried as checked baggage MUST be unloaded, packed in a locked hard-sided container, and declared to the airline at check-in.	No	Yes
Flare Guns - May be carried as checked baggage, but MUST be unloaded, packed in a locked hard-sided container, within hazardous material regulations, and declared to the airline at check-in.	No	Yes
Flares	No	No
Gun Lighters	No	No
Gun Powder - Including black powder and percussion caps	No	No
Parts of Guns and Firearms	No	Yes
Pellet Guns	No	Yes
Realistic Replicas of Firearms	No	Yes
Starter Pistols - Can only be carried as checked baggage and MUST be unloaded, packed in a locked hard-sided container, and declared to the airline at check-in.	No	Yes

NOTE: Check with your airline or travel agent to see if firearms are permitted in checked baggage on the airline you are flying. Ask about limitations or fees, if any, that apply.

Martial Arts & Self Defense Items

Item	Carry-on	Checked
Billy Clubs	No	Yes
Black Jacks	No	Yes
Brass Knuckles	No	Yes
Kubatons	No	Yes
Mace/Pepper Spray - One 4 fl. oz (118 ml) container of mace or pepper spray is permitted in checked baggage provided it is equipped with a safety mechanism to prevent accidental discharge. Self-defense sprays containing more than 2% by mass of Tear Gas is prohibited in both checked bag and checkpoint. For more information visit faa.gov.	No	Yes
Martial Arts Weapons	No	Yes
Night Sticks	No	Yes
Nunchucks	No	Yes
Stun Guns/Shocking Devices	No	Yes
Throwing Stars	No	Yes

NOTE: Any sharp objects in checked baggage should be sheathed or securely wrapped to prevent injury to baggage handlers and Transportation Security Officers.

Tools

Item	Carry-on	Checked
Axes and Hatchets	No	Yes
Cattle Prods	No	Yes
Crowbars	No	Yes
Hammers	No	Yes
Drills and drill bits - Including cordless portable power drills	No	Yes
Saws - Including cordless portable power saws	No	Yes
Tools - Greater than 7 inches in length	No	Yes
Screwdrivers/Wrenches/ Pliers - Greater than 7 inches in length	No	Yes

NOTE: Any sharp objects in checked baggage should be sheathed or securely wrapped to prevent injury to baggage handlers and Transportation Security Officers.

APPENDIX B: SEAL PROGRAM AGREEMENT TEMPLATE

[Airport Authority]

[Address]

[City, State Zip]

AFFIDAVIT FOR WAREHOUSE SEAL PROGRAM

The purpose of this affidavit is to certify that all product/items loaded into delivery trucks bound for [airport name] are accounted for prior to delivery.

1. This affidavit must be signed by an authorized supervisor at the warehouse after the truck has been loaded
2. The authorized supervisor must list the time, date, truck number, truck driver's name, and the seal number below.

TO BE COMPLETED BY THE WAREHOUSE REPRESENTATIVE

DATE: _____ TIME: _____

This is to certify that I, _____, have knowledge of what product/items were loaded into truck number _____ driven by _____ and I have affixed seal number _____ to said truck cargo latch. I swear, to the best of my knowledge, that all product/items loaded into the above-mentioned truck are in compliance with all current Transportation Security Administration Security Directives.

_____

TO BE COMPLETED BY THE AIRPORT SECURITY REPRESENTATIVE

DATE: _____ TIME: _____

This is to certify that I, _____, have inspected the above-mentioned vehicle and product/items contained on and/or in the said vehicle and all listed information is correct. I swear, to the best of my knowledge, that all products/items entering the terminal building are in compliance with all current Transportation Security Administration Security Directives.

_____