Checkpoint Requirements and Planning Guide (CRPG)

December 17, 2018

U.S. Department of Homeland Security
Transportation Security Administration

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Disclaimer

It is the project sponsor's responsibility to create drawing concepts, issue construction documents, and provide as-built drawings. TSA equipment is subject to change, which may affect the checkpoint space and infrastructure requirements. As such, the project sponsor should be prepared to update these documents as needed.

Additionally, adjustments may be required after installation of TSA equipment if there are changes to design and/or operations of the checkpoint. Maximum flexibility in the checkpoint size and infrastructure needs to be considered for future checkpoint reconfigurations and new checkpoint terminal planning. The airport should check with the TSA checkpoint design team/Innovation Task Force (ITF) for the latest documents and request updated documents/standards every 6 months at a minimum.

TSA does not endorse specific equipment or specific original equipment manufacturers (OEMs) in any way. This document does not endorse any specific equipment. Any and all equipment shown is for example only.

Version History

Revision	Date	Description of Changes	Section(s) Affected
0	12/17/2018	Initial Publication	All

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SSCP Terminology

Acronym	Definition
1-D	One Dimensional
1-to-1	1AT for 1 WTMD and 1 AT for 1 AIT
2-D	Two Dimensional
2-to-1	2 AT for 1 WTMD 2 AT for 1 AIT
2 to 2	2 AT for 2 AIT
3-D	Three Dimensional
A	Amp(s)
A&E	Architectural and Engineering
A4A	Airlines for America
ABC	Alarm Bag Cutout
ACG	Area Control Gateway
ADA	Americans with Disabilities Act
AFF	Above Finished Floor
AFSD	Assistant Federal Security Director
AHJ	Authority Having Jurisdiction
AIT	Advanced Imaging Technology
ALPA	Air Line Pilots Association, International
ANSI	American National Standards Institute
APSS	Accessible Property Scanning System
ARW	Alarm Resolution Workstation
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASL	Automated Screening Lane
ASP	Airport Security Plan
AT	Advanced Technology
AT2	Second Deployment of AT; includes AVS
ATR	Automatic Target Recognition
AVS	Alternate Viewing Station
BLS	Bottled Liquids Scanner
BRS	Bin Return System
BVS	Baggage Viewing Station
CAT	Credential Authentication Technology
Cat5/Cat5e/Cat6	Category 5 data cable/Category 5e data cable/Category 6 data cable
CBIS	Checked Baggage Inspection System
CCTV	Closed-Circuit Television
CDG	Checkpoint Design Guide
CL	Centerline
CRPG	Checkpoint Requirements and Planning Guide

Acronym	Definition
DOT	Department of Transportation
DHS	Department of Homeland Security
eAIT	Enhanced AIT
EMD	Enhanced Metal Detector
EPPM	Environmental Planning Program Manager
ERI	Equipment Request Interface
eTAS	Electronic Time, Attendance, and Scheduling
ETD	Explosive Trace Detection
fc	Foot-candle(s); unit of luminance or light intensity
FF&E	furniture, fixtures, and equipment
FIS	Federal Inspection Service
FDRS	Field Data Recording System
FRM	Field Regional Manager
FSD	Federal Security Director
ft^2	Square Foot (Feet)
FY	Fiscal Year
GS	Global Strategies
Hi-SOC	High Speed Operational Connectivity
HQ	Headquarters
HSC	High Speed Conveyor
HVAC	Heating, Ventilation, and Air Conditioning
ICM	Input Control Module
IDF	Intermediate Distribution Frame
IEEE	Institute of Electrical & Electronics Engineers
IESNA	Illuminating Engineering Society of North America
IMAC	Install, Move, Add, or Change
IO	Image Operator
IT	Information Technology
KCM	Known Crewmember®
kVA	Kilovolt-ampere
LAGs	Liquids, Aerosols, and Gels
LAN	Local Area Network
LCU	Lane Control Unit for the L3 ProVision AIT
LEO	Law Enforcement Officer
LH	Left Hand
LPD	Last Point of Departure
MAX	Maximum
MCB	Main Circuit Breaker
MDF	Main Distribution Frame

Acronym	Definition
MDR	Manual Diverter Roller
MIN	Minimum
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NEPA	National Environmental Policy Act
O&D	Origin and Destination
OEM	Original Equipment Manufacturer
OOB	Out of Band
OSHA	Occupational Safety and Health Administration
OSHE	Occupational Safety, Health, and Environment
PAX	Passengers
PDF	Portable Document Format
POC	Point of Contact
POE	Power Over Ethernet
POR	Program of Requirements
psf	Pound(s) per Square Foot
PSP	Passenger Screening Program
PSR	Private Screening Room
PVS	Private Viewing Station
PWD	Passengers with Disabilities
QPL	Qualified Product List
RDM	Regional Deployment Manager
ReMAG	Requirements Management Advisory Group
REMD	Real Estate Management Division
RF	Radio Frequency
RGS	Rigid Galvanized Steel
RH	Right Hand
S3	6' W x 8' L x 8' H KI glass room with 3' door on short side. Used for Private Screening Room.
S3-A	8' W x 6' L x 8' H KI glass room with 3' door on long side. Used for Private Screening Room.
SC	Security Capabilities
SCP	System Control Processor
SF	Square Foot (Feet)
SME	Subject Matter Expert
SO	Scanning Operator
SOW	Scope of Work
SSCP	Security Screening Checkpoint
SSI	Security Sensitive Information
STIP	Security Technology Integrated Program
STSO	Supervisory Transportation Security Officer

Acronym	Definition
TCOP	Touch Control Operator Panel
TIP	Threat Image Projection
TDC	Travel Document Checker
TLC	TSA Logistics Center
TRX	TIP-Ready X-Ray
TSA	Transportation Security Administration
TSE	Transportation Security Equipment
TSL	Transportation Security Laboratory
TSO	Transportation Security Officer
UPS	Uninterruptible Power Supply
UTP	Unshielded Twisted Pair
V	Volt(s)
VIPR	Visible Intermodal Prevention & Response
WAP	Wireless Access Point
WTMD	Walk-Through Metal Detector

1 Introduction

The Transportation Security Administration (TSA) is mandated by law to screen air travelers and their carry-on bags in order to identify and intercept prohibited items at the Security Screening Checkpoints (SSCPs) at Federalized airports across the United States. Each checkpoint represents a point of entry into the aviation system and must meet security criteria. Aviation security continues to evolve and adapt to meet the constantly changing threat environment. This Checkpoint Requirements and Planning Guide (CRPG) replaces the Checkpoint Design Guide (CDG) and was created to:

- Communicate the current checkpoint design standards for qualified technology
- Provide information and planning considerations for emerging technologies anticipated to be qualified within the near future
- Provide information to locate equipment within the checkpoint to provide the highest level of security screening and efficiency from the queue through the composure area.

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0	12/17/2018	Initial Publication

1-1 Purpose

The information in this guide must be used when designing new checkpoints or reconfiguring existing checkpoints. Proper SSCP design helps avoid costly problems for the airport, airlines, and TSA. It also provides a smoother and safer experience for the passenger while increasing the efficiency of the screening process. Improper SSCP design can result in terminal and checkpoint queue congestion, decreased efficiencies, flight delays, and unnecessary security risks.

The CRPG will be used to guide airports and countries in development of Preclearance locations around the world. The CRPG will also be used by Global Strategies (GS) to assist our international partners. The goal is to raise the security baseline for Last Point of Departure (LPD) flights to the United States by sharing design standards and lessons learned with other countries for the deployment of advanced technology.

This guide is a "living" document that is updated when new technologies or processes are adopted by TSA. Airports should use the link on the cover page of this guide to obtain the most recent version.

1-2 Scope

Every airport and airport terminal building is unique in physical design and functional requirements. A single SSCP solution will not work for every airport. Every SSCP location must be reviewed as an entity of the overall airport security system. The CRPG provides direction and recommendations on how to construct, deploy equipment, install equipment, locate, and size a new SSCP and plan for future capability based on the following conditions:

- Facility infrastructure and operations
- Current screening technology/equipment
- Type of risk
- Passenger loads/number of enplanements/aircraft type

The CRPG is intended to supplement—but not replace—Original Equipment Manufacturer (OEM) requirements and recommendations, as well as local codes and regulations. All designs and reconfigurations must be coordinated with TSA Headquarters (HQ) checkpoint designer, TSA HQ stakeholders, local Federal Security Director (FSD) and staff, and local airport stakeholders so that the recommended guidelines can be incorporated into the final checkpoint design.

2 Roles, Responsibilities, and Project Planning

Security Screening Checkpoints (SSCPs) are an important element to an airport's overall terminal design and must be considered in the early stages of planning and conceptual layout. Every airport has a unique physical design and functional requirements; therefore, a single design solution will not work for every checkpoint. Frequent communication and close coordination between TSA Headquarters (HQ), local TSA, and the project sponsor is critical to successful construction of a new, or modification of an existing, TSA SSCP. To effectively and efficiently coordinate, and design a checkpoint that will maximize security and throughput, reduce operating costs, and improve passenger experience, it is critical to understand the project planning and design process and timing of key considerations and dependencies.

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2-1 Roles and Responsibilities

Involvement of and communication across the stakeholders are crucial to ensure adherence to the TSA design standards so proper equipment and resources are deployed to support the infrastructure updates that will heighten security, increase throughput, reduce on-the-job injuries, make staffing more dynamic, and improve passenger experience. There are two main roles for airport projects—the project sponsor and TSA HQ.

The project sponsor is the airport owner/operator or the airline funding and initiating checkpoint improvements. The project sponsor may include local representatives of overall airport operations. The project sponsor is responsible for all aspects of the project including basic engineering, hiring of a licensed architectural and engineering (A&E) firm, communications, master planning, project management, and other appropriate design functions and funding. Examples of project sponsor–driven projects include new or renovated checkpoint(s) driven by increased capacity, the addition of lanes, new terminals, etc.

TSA HQ is the representative from TSA responsible for review and approval of all design submittals and prioritization of equipment availability and deployment logistics. TSA HQ may also include a Systems Integrator to assist with checkpoint planning, design, shipment/installations, and modifications that are funded by the project sponsor.

Responsibilities of TSA HQ include:

- Approving the number of lanes required or permitted at a checkpoint based on airport category, unique security requirements, and passenger volume once the project sponsor forecasts demands, and planning for growth and increased capacity based on the life expectancy of the checkpoint
- Providing regular correspondence of lessons learned and regularly updating stakeholders of design and process changes
- Performing technical and operational review of designs including coordinating with local TSA during design to ensure relevance and operational feasibility; approving all designs
- Reviewing the impact of screening protocol changes
- Brainstorming operational and policy issues
- Determining the specific equipment type(s) to be used (including the vendor if unknown at time of design; vendor is subject to change when planning for future considerations)
- Scheduling deployment of new equipment
- Consulting with TSA Occupational Safety, Health, and Environment (OSHE) specialists and/or locally assigned organizational OSHE specialists to verify Life Safety Code compliance, and to coordinate Baseline Hazard Assessments of newly constructed space at handover (if applicable)
- Conducting National Environmental Policy Act (NEPA) Environmental Planning Reviews (set up by Project Manager or Deployment Coordinator)
- Ensuring optimal design to create an environment for a good passenger experience and an area where Transportation Security Officers (TSOs) can perform their security mission unimpeded
- Advising on future space planning considerations

- Coordinating with contractors as required for checkpoint infrastructure improvements for project-sponsored checkpoint projects
- For TSA-funded new equipment only:
  - Coordinating shipping, storing, transporting, and installing equipment at the checkpoint for TSA-funded new equipment
- Consulting with project stakeholders as needed/requested

2-2 Project Planning and Design

Security screening is intended to deter and prevent hijackings and the transport of explosive, incendiary, or other dangerous/prohibited items aboard commercial aircraft. Sterile areas are defined as those areas where aircraft access is possible only for persons that have undergone security screening. Non-sterile areas are accessible to the general public and are located prior to any checkpoint or direct access control point. SSCPs are critical nodes of circulation from non-sterile to sterile areas for passengers, airport employees, and goods. SSCPs play a vital role in aviation commerce and are an important element to consider in an airport's overall terminal design.

When designing a new or reconfiguring an existing terminal or checkpoint, the following, at a minimum, should be considered early in the planning and design phase:

- Sufficient square footage to support current TSA technology and screening processes—consideration should be given to making space available in a sensible manner for planned volume growth and associated screening capacity at the checkpoint over the expected life of the checkpoint or terminal and operational flexibility in response to changes in passenger loads, equipment, technology, processes, and security levels
- Ability to secure lanes during SSCP operational and non-operational hours; may include locking doors, gates, and barriers; automatic exits in accordance with the approved Airport Security Plan; sufficient passenger queuing space based on current and planned future needs; and/or continuous monitoring by law enforcement/security personnel
- Wheelchair accessibility and allowances for persons with disabilities and/or assistive devices
- Minimal interruption or delay to the flow of passengers and others being screened
- Effective and secure handling of goods transported from the non-sterile area to the sterile area
- Protection of SSCP equipment during non-operational hours
- Equipment maintenance clearances
- Efficient and effective use of terminal space
- Acceptable and comfortable environmental factors, such as air temperature, humidity, air quality, lighting, and noise
- Safe and ergonomic design
- Coordination of power, data, fiber optics, closed-circuit television (CCTV), and lighting at the SSCP
- Contingency plans for power outages and system challenges (good practice for the airport, but not required by TSA for the checkpoint)

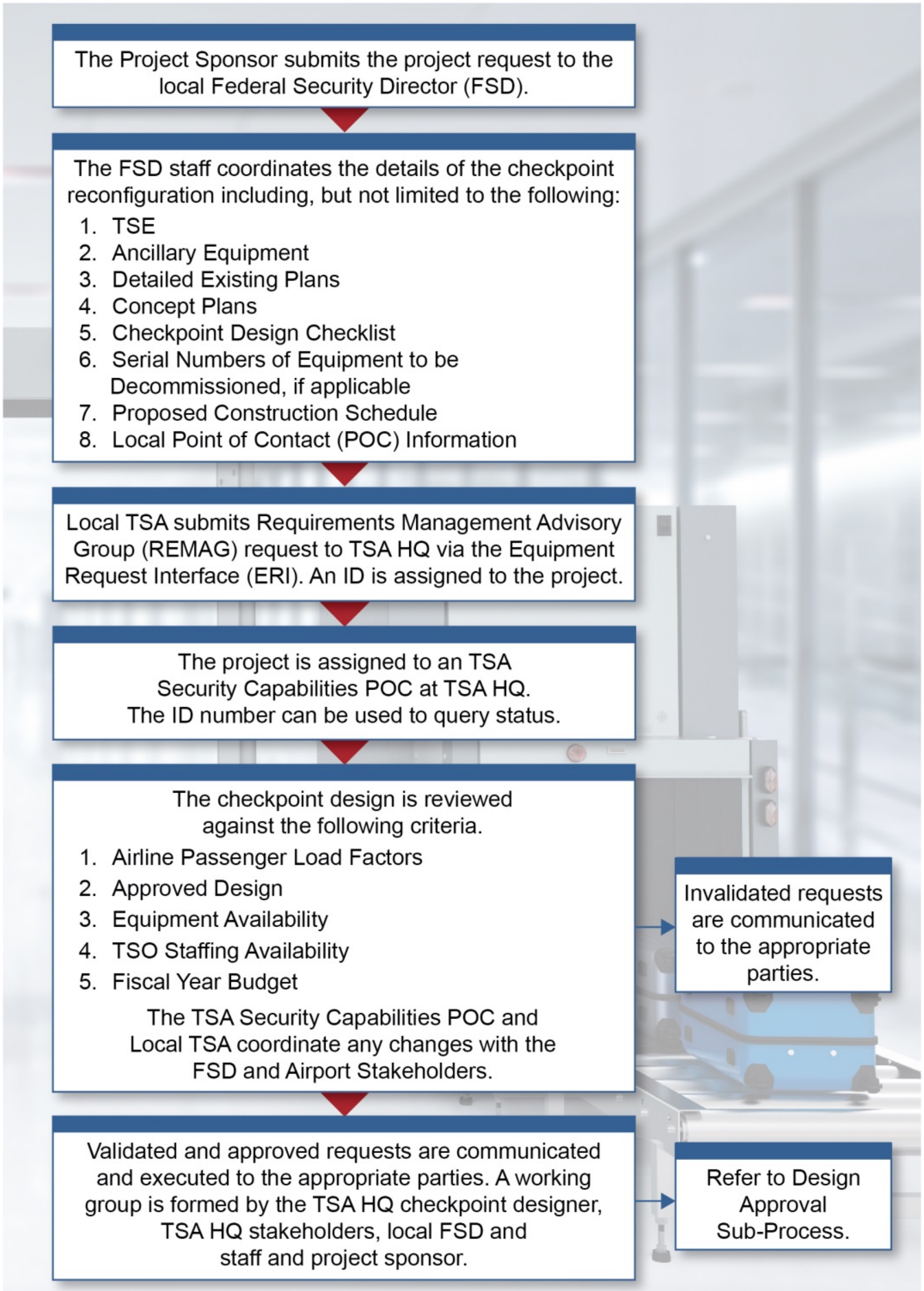
- Allowance for TSA office/support space (including private screening, remote screening, and Information Technology [IT]/Automated Screening Lane [ASL] server rooms), which needs to be negotiated through the Real Estate Management Division (REMD) of TSA Finance and Administration
- Staffing efficiency for TSA and other security personnel
- Coordination with the Environmental Planning Program Manager to ensure compliance with the NEPA and other applicable environmental regulations
- Completion of a blast mitigation study for any checkpoint constructed over a roadway or where the front of the checkpoint is in close proximity to a roadway to ensure appropriate steps are taken to ensure the public and officers are protected to the best of the airport's ability

Project Design Process and Planning Milestones

The process for designing a new checkpoint generally includes an initial concept design, TSA and airport authority review, final design, construction/installation, and record drawing completion. ***TSA designers must review and approve all designs and any deviations from the design standards outlined in this guide.***

Variance or Deviation from Design

The Checkpoint Requirements and Planning Guide (CRPG) provides the space and equipment needed by TSOs to conduct screening and security operations as mandated by TSA. Proper layout and furnishing of the checkpoint are essential to ensuring that TSOs can perform their duties effectively, efficiently, and safely. Careful consideration needs to be given to the operational controls, environmental and ergonomic configuration, and equipment specified for the checkpoint. Although each airport is different and the available space may differ, all checkpoints need to follow the same layout concept. This standardizes training and improves personnel utilization across multiple checkpoints within an airport. Local TSA can submit a written request for a deviation from the CRPG. The request will be reviewed and approved or denied by TSA HQ stakeholders.



During the concept design phase, the designer determines the modification scope of the checkpoint including additional equipment to be deployed and/or relocation of existing equipment. Once a new layout is created, the existing and proposed layouts are submitted to TSA and local TSA for review and approval of requested changes. After the initial concept design is created and submitted, TSA designers are available to collaborate via on-site workshop or internet-based meeting to work with the project sponsor and ensure TSA requirements are met. It is important to note that there may be multiple iterations of the concept design. Typical milestones include 30%, 60%, and 90% and may contain phasing plans and future equipment considerations.

Once all changes resulting from the concept design phase have been incorporated, 100% designs of the existing and proposed checkpoint, including electrical/data layout, are submitted to TSA for final approval.

The ***Deliverable Milestones*** box below lists the major checkpoint design deliverables, which should be submitted to TSA via formal documentation. The ***Final Design Package*** box lists the key documents to be issued for approval prior to construction.

Deliverable Milestones

1. Requirements Management Advisory Group (ReMAG) Submission
2. Concept Design Submission (including electric & data sheets in separate PDF and all leased and non-leased space)
2. Final Design Submission
3 Site Readiness/Verification Visit
4. As-Built Drawings

Final Design Package

- Equipment description sheet
- Equipment delivery paths
- Electrical/data details/layouts/modifications
- Seismic structural details
- All requirements specified by the Airport Authority
- Phasing plan to minimize operational disruption
- Glare study, if applicable
- Vibration study, if applicable
- Blast study, if applicable

The TSA Design Approval Process, described below, ensures the requirements of this guide are met while still allowing flexibility to accommodate the unique physical and operational aspects in the field and best plan for the future.

TSA Design Approval Process

When a new checkpoint layout is required, TSA requires the project sponsor's A&E designer to begin the process using the criteria described in this guide. These criteria are based upon the deployment of new equipment and/or relocation of existing equipment and are typically outlined in a deployment schedule produced by TSA. Equipment layout and dimensional requirements provide quality assurance/quality control that the layout meets general guidelines for a security checkpoint.

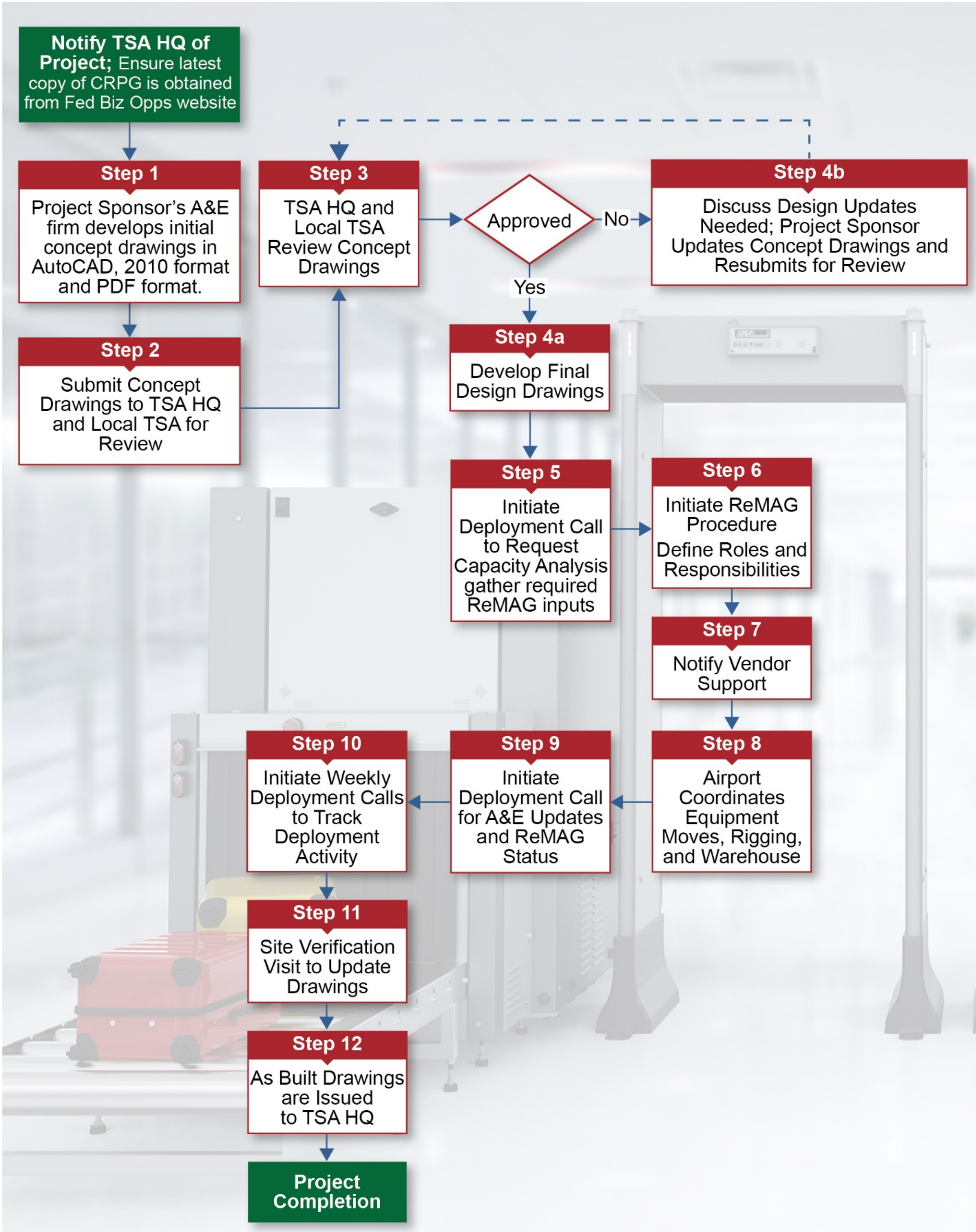
All designs are currently to be produced in AutoCAD format, saved to 2010 format for compatibility. The AutoCAD files should contain a background floor plan of one or more TSA security screening checkpoints for the airport. All TSA equipment is represented by dynamic AutoCAD blocks that are standard for all checkpoint designs and should be obtained from TSA. The standard equipment dynamic blocks, when not mirrored, allow the A&E designer to manipulate and locate the TSA equipment within the checkpoint while allowing only the available configurations as specified by the manufacturer for each piece of equipment. When the A&E designer completes an initial checkpoint layout, existing and final conditions are plotted to PDF and the initial concept design is submitted by email to TSA for review and approval/rejection. TSA reviews the layout and replies with approval or rejection of the planned checkpoint configuration. If the concept design is not approved, a working session is scheduled/coordinated by the A&E designer or TSA to modify the initial concept design. The A&E designer manages the conference while taking input from all stakeholders and modifies the layout in real time to ensure the recommendations are fulfilled. Then the A&E designer resubmits the concept design to TSA for approval/rejection.

It is not uncommon for there to be months, even years, between designs and/or phases of work. It is highly recommended an annual or bi-annual meeting be held with TSA HQ to ensure all parties remain well-informed.

Upon approval of the revised concept design, the A&E designer completes the final drawings, which include equipment delivery paths, layout modifications, and a schedule for provided and relocated equipment. The final drawings should include electrical designs for installing new or modifying existing electrical/data devices. The final drawings, including electrical/data layout, should be submitted to TSA for review before construction.

The A&E firm should coordinate with the local Airport Authority for approval and/or permitting through the Authority Having Jurisdiction for construction. Depending on site location and project complexity, permits and approvals may or may not be required. This should be determined early in the project. Some sites require Airport Authority approval only. Permitting or approvals may require additional information to be provided in the deliverable that is beyond the information given in this guide. During checkpoint construction, changes may occur that are initiated by local TSA, on-site conflicts, Airport Authority requests, or other instances unforeseen in design. The A&E designer should coordinate with TSA for resolution of any conflicts.

After completion of the checkpoint installation, the A&E designer is to create Record Drawings from contractor's red-line drawings and post-construction photographs. Following completion of the Record Drawings, the A&E designer provides both a PDF and AutoCAD 2010 file to the TSA designer.


Notify TSA HQ of Project; Ensure latest copy of CRPG is obtained from Fed Biz Opps website
Step 1
Project Sponsor's A&E firm develops initial concept drawings in AutoCAD, 2010 format and PDF format.
Step 2
Submit Concept Drawings to TSA HQ and Local TSA for Review
Step 3
TSA HQ and Local TSA Review Concept Drawings
Approved
No
Yes
Step 4b
Discuss Design Updates Needed; Project Sponsor Updates Concept Drawings and Resubmits for Review
Step 4a
Develop Final Design Drawings
Step 5
Initiate Deployment Call to Request Capacity Analysis gather required ReMAG inputs
Step 6
Initiate ReMAG Procedure
Define Roles and Responsibilities
Step 7
Notify Vendor Support
Step 8
Airport Coordinates Equipment Moves, Rigging, and Warehouse
Step 9
Initiate Deployment Call for A&E Updates and ReMAG Status
Step 10
Initiate Weekly Deployment Calls to Track Deployment Activity
Step 11
Site Verification Visit to Update Drawings
Step 12
As Built Drawings are Issued to TSA HQ
Project Completion

Design Approval Considerations

To achieve approval during the design planning phase, checkpoint designs must fulfill certain criteria as prescribed by this guide. When designing or reconfiguring a terminal and/or checkpoint, the following aspects are considered by TSA for approval:

- Square footage to support transportation security equipment (TSE), to include future growth planning (When feasible, airports should plan for increased passenger growth and associated capacity planning for the expected lifespan of the checkpoint/terminal.)
- Flexibility for screening operations and modifications to future processes and technology
- Square footage to support passenger queue and other screening functions
- Square footage to support TSA leased and non-leased space
- Americans with Disabilities Act (ADA) compliance
- Protection of checkpoint TSE and other equipment; access control while the checkpoint is in operation and when it (or lanes) are closed
- Flexibility in response to changes in passenger and security levels
- Efficient use of checkpoint space
- Acceptable environmental factors
- Coordination of power and data requirements
- Safe and ergonomic design with human factors taken into account
- Contingency plans for system challenges
- Allowance for efficient TSE staffing space
- Equipment maintenance
- Perimeter wall of the checkpoint
- Lighting is efficient and meets requirements (minimum luminance level of 30 foot-candles [fc], 60 fc recommended)
- Heating, ventilation, and air conditioning (HVAC) study to ensure proper cooling and heating for SSCP

Space Planning

TSA requires space at every airport in the United States and its possessions and Territories that have scheduled commercial airline service. When designing a new checkpoint, it is important to take into account both leased and non-leased space required for TSA to accomplish its mission. Non-leased space includes but is not limited to the SSCP, Private Screening Room (PSR), IT Room, Remote Resolution Room, and some storage rooms. Leased spaces include the TSO training room, TSO break room, and offices.

The REMD of TSA Finance and Administration is responsible for providing facilities services for all workspace locations by managing office and airport space allocations; lease acquisitions; design, construction, and renovation of tenant space; furniture acquisition, and facilities support. REMD should be engaged early in the planning of new airport construction projects to allow the opportunity to procure quality spaces for TSA. REMD will develop a program of requirements for space and specifications for construction, and provide those documents to the airport or lessor's architect in advance. TSA IT and/or Physical Security may also need to review the space planning considerations. The TSA design team will coordinate with the TSA security components as necessary. More information can be found in the table below:

TSA Space Guidelines	Outlines the planning methods used by the Office of Finance and Administration to assign and allocate TSA space; designed to assist in making efficient and practical decisions about acquiring and planning TSA workspaces	PDF TSA Space Management Guide

Lighting and Glare Considerations

Lighting requirements for a new checkpoint must meet local and/or national codes and the luminance levels identified in ANSI/IESNA RP-104. In locations where critical decisions are made based on visual evaluation (e.g., at bag inspection tables or the Travel Document Checker [TDC] podium), a minimum luminance level of 30 fc is required (60 fc is preferred). Emergency lighting, as required by the building code, should also be a part of the overall design for SSCPs.

TSA does not provide overhead lighting. The airport is expected to provide sufficient overhead lighting to support the screening functions at the checkpoint.

In addition to sufficient lighting, glare must be considered. Reflectance adjacent to task-critical displays should be reduced. Surfaces adjacent to displays must have a dull, matte finish. Natural overhead light (i.e., windows, glass ceilings, glass walls) can cause or exacerbate glare issues and must be addressed. Reference MIL-STD 1472g regarding filter control of light sources to mitigate potential glare issues.

All lighting designs must be reviewed by the work group to identify any issues with window or monitor glare, and to ensure there is adequate lighting at the search table and TDC locations.

National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) of 1969 requires all Federal agencies to consider the environmental impacts of proposed actions before decisions are made and actions are taken. An evaluation process, called an environmental review, determines whether the proposed project may have significant impact on the environment. NEPA reviews are best performed alongside the project planning process to reduce the potential for delays or added cost.

Prior to TSA approval of the 30% design, TSA's Environmental Planning Program Manager (EPPM) must conduct an environmental review of TSA's actions to evaluate the potential for environmental impacts and compliance with applicable environmental regulations. NEPA reviews are initiated by the TSA Project Manager or Deployment Coordinator by submitting a secure Proposed Action Questionnaire to the EPPM or by contacting TSAEnvironmentalPlan@tsa.dhs.gov.

NEPA Fact Sheet	Overview of NEPA applicability, implementation, and benefits	PDF NEPA Fact Sheet_5_1_15.pdf

National Safe Skies Alliance, Program for Applied Research in Airport Security

As noted on the Safe Skies website, the Program for Applied Research in Airport Security (PARAS) is an industry-driven, applied research 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 (FAA), and modeled after the Airport Cooperative Research Program of the Transportation Research Board. Projects are developed from Problem Statements submitted by industry professionals. Completed findings are available on the Safe Skies website. All findings have had extensive participation in and contributions of content by federal agencies, industry trade associations, and individual architects, engineers, security consultants, and other subject matter experts.

Available on the Safe Skies website is PARAS Report 00004, **Recommended Security Guidelines for Airport Planning, Design, and Construction**. The guidelines are not government regulations or requirements; they are a compendium of real-world experience and best practices developed by outstanding professionals in the field.

Media Inquiries

New and updated security equipment is often a topic of interest for local media. If your airport receives a media inquiry about new security screening equipment installation, contact the Office of Public Affairs at TSAMedia@tsa.dhs.gov.

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3 Security Screening Checkpoints (SSCPs)

SSCPs consist of Transportation Security Equipment (TSE) and non-powered ancillary equipment. The equipment in this guide is listed in the order that a passenger encounters it, from the non-sterile area to the sterile area.

Every checkpoint has essentially the same elements, which are site-adapted to the existing conditions. While the queue and composure areas may vary significantly from checkpoint to checkpoint, the screening lanes are fairly consistent with the type of equipment deployed even though the equipment footprint can vary by manufacturer.

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3-1 SSCP Elements

SSCPs are created by combining standard one- and two-lane module sets. A typical one-lane module set consists of:

1. Travel Document Checker (TDC) or Credential Authentication Technology (CAT)
2. Accessible Property Scanning System (APSS) and components (X-ray, CT)
3. Manual Diverter Roller (MDR)
4. Walk-Through Metal Detector (WTMD) and/or Advanced Imaging Technology (AIT)
5. Alternate Viewing Station (AVS)
6. Explosive Trace Detection (ETD)
7. Bottled Liquids Scanner (BLS)
8. Passenger Inspection
9. Bag Inspection
10. Other security technologies

A two-lane module set is the same as a one-lane module set but with the addition of an APSS and associated screening equipment. The module sets are created based on the recommended TSA spacing for passenger ingress/egress, clearance for maintenance activities, and prevention of passenger breaches. Separation of sterile and non-sterile areas provides a controlled and contained screening environment.

A modular design enables TSA to determine the depth and width needed for a set number of lanes. The number of lanes is based on the passenger load and the physical space provided by the airport. Contact TSA Headquarters to assist with determining the number of lanes needed to meet the passenger load in the space allotted for the SSCP. As the number of enplanements per year increases and the equipment and technology evolve, the SSCPs need flexibility to change and expand. Allowances for modifications must be included in the Airport Master Plan.

Vulnerabilities specific to a particular airport will dictate where the checkpoint is situated within the terminal. During periods of elevated threat or special events, temporary SSCPs may need to be installed. If this is a potential option, floor space and temporary utilities should be planned into the terminal design by the airport.

3-2 Transportation Security Equipment (TSE)

The TSE included in this guide includes the following:

1. Certified Equipment is TSE that has passed testing (i.e., meets certain performance parameters such as detection and false alarm rates) at the Transportation Security Laboratory (TSL) and is ready for operational test and evaluation in the field. This equipment ***cannot*** be procured for use in security screening. See the TSA Certified TSE section for information on equipment that is currently certified.

2. Qualified Equipment is TSE that has passed TSA operational test and evaluation and determined suitable for use by TSA in the field. This equipment ***can*** be procured for use in security screening subject to TSA oversight (i.e., on the Qualified Product List [QPL]).

The project sponsor is not required to use the furniture, fixtures, and equipment (FF&E) provided by TSA. The project sponsor may purchase their own equipment provided it complies with TSA design standards and requirements.

Planning for future technologies allows flexibility and cost-savings but there is also risk—certified technologies do not all become qualified TSE, and specifications may change throughout the development and testing processes. Communicating regularly with TSA designers will ensure potential issues are identified and mitigated in a timely manner.

Checkpoint Furniture, Fixtures, and Equipment Guide	Overview of non-TSE checkpoint FF&E available to airports and TSA sites, including shipment lead times	PDF Checkpoint Furniture Fixtures and Equipme

3-3 Planning Considerations for Emerging Capabilities

SSCP technology is a dynamic and rapidly changing field. No matter how carefully an airport is designed to take maximum advantage of the current technology, designs must be sufficiently adaptable to meet the changing threats and support emerging technology. Security screening equipment dimensions and/or processes may change, requiring the entire airport security managerial infrastructure to make important decisions regarding modifications, which the designer must then accommodate. The designer's task will be easier if the original design has anticipated the need for change and has provisions for expansion. Electrical and data infrastructure should also be flexible. Planning for adaptable electrical/data devices will best support future changes.

3-4 SSCP Boundaries

The boundaries of an SSCP will vary by airport based on SSCP configuration, airport security requirements, and TSA requirements for a particular checkpoint. Typically, the SSCP length starts at the TDC podium(s), extends through the checkpoint elements discussed in this section, and ends at the checkpoint exit, which could be at or near the egress seating area or Supervisory Transportation Security Officer (STSO) podium. The SSCP width is the wall-to-wall width of the checkpoint, including all the screening lanes and, where applicable, a co-located exit lane. All walls adjacent to the non-sterile side or running the length of the side of the SSCP need to be at least 10'-0" high to prevent the passage of prohibited items from the non-sterile area to the sterile area. The 10'-0" high or full-height wall should be installed from the entrance of the TDC to the exit of the checkpoint beyond the screening equipment into the sterile area. This wall separates the SSCP from other tenants and activities in the terminal preventing intrusion into the screening process. Checkpoint boundaries are to be designed according to this document. When an airport is installing a space for future lanes, the area between proposed and future space shall be separated by a 10'-0" high or full-height temporary wall. In the future, new technology may extend the current boundaries to include additional equipment and functions within the checkpoint or equipment and functions located remotely within the airport. Front walls separating the SSCP from the non-sterile area should be securable when screening operations are not occurring. The preferred location of the front wall is just forward of the divest lanes. Proper TSO egress must be provided if there is inadequate room for an access gate.

Securable Access

Securable access to the checkpoint can come in multiple forms. TSA utilizes securable access to prevent unauthorized access during screening operations. If an airport wants to utilize securable access to prevent access during non-TSA operations, the solution must be fully enclosed. Swing doors are readily available but present issues with moving passenger control equipment to open or close access. Another issue with swing doors is the available opening. Larger checkpoints with multiple TDC positions require an opening of approximately 28'-0" per two-lane module set if in plane with the TDC podiums. Swing doors are acceptable for smaller checkpoints where one TDC is required. Sliding doors or grills are also readily available. Sliding doors and grills can be configured to provide larger unobstructed openings. Care should be exercised with sliding devices so that the bottom track is secure to prevent intrusions. Sectional doors are acceptable provided, when open, the stacked leaves are nonobtrusive. Roll-up doors or grills are desirable because they are secure at the bottom track and can provide large obstruction-free openings. Roll-up or sliding grills should be security type with anti-pass features such as polycarbonate infill or solid slats.

Movable Partitions

Movable partitions are ceiling-supported segmented or sectional doors that roll back to a storage area to create a large single opening. Movable partitions have the advantage of an open checkpoint when open and secured checkpoint when closed. Movable partitions require support from a ceiling-mounted track and, therefore, are limited to those situations where one is available. As with sliding doors and grills, the bottom track of moveable partitions should be secure to prevent intrusions.

Access Scalability

Scalable access of the lanes in a large checkpoint is important. Checkpoints are staffed based on passenger screening demand. Large checkpoints must have the capability to prevent passengers from accessing unused lanes and circumventing screening. Barriers must be at least 5' in height and extend from the first fixed divest point on a lane to a fixed element or hard barrier at the TDC positions. Barriers are to be movable or removable to allow passengers to circulate between staffed lanes. Barriers shall be provided at one per every four lanes of screening.

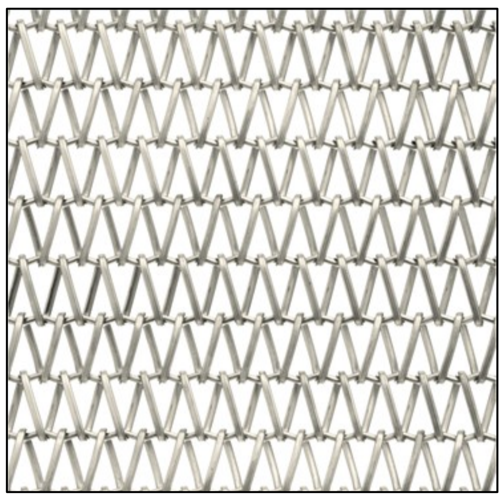
Access scalability is extremely important. Large checkpoints must have the capability to prevent passengers from accessing unused lanes and circumventing screening.

3-5 Exits from Secure Side

An exit can be co-located with a checkpoint, or it can be located independent of the checkpoint. This lane should be easily identifiable without adversely affecting security. It should also be adequately sized for deplaning passengers exiting the concourse. All local building code egress path requirements must be met.

A minimum 10'-0" or full-height wall is required to separate the checkpoint from the exit lane or separate the sterile area from the non-sterile area. This height impairs the ability for un-cleared passengers to pass prohibited items to a cleared passenger. This requirement should be coordinated with the Airport Authority when a new checkpoint is being considered or an existing checkpoint is being reconfigured and the exit lane needs to be modified. Should the 10'-0" wall pose an issue for heating, ventilation, and air conditioning (HVAC) and/or sprinkler systems, use of an 8'-0" wall may be acceptable with the addition of a framed security screen or mesh to allow air and water flow, to make up the difference in height.

Framed Security Mesh



An exit lane is typically equipped with a table, chair, and podium for a person to monitor the area and deter those attempting to bypass the SSCP from the non-sterile area. The monitor should be located so that traffic attempting to enter the exit lane from the wrong direction can be intercepted. The exit should also include a duress alarm system to covertly alarm of any threat to security, as well as a phone. TSA and the airport may share operational responsibility of the exit lane with other parties, such as the airport operator or an airline carrier. These parties contribute to the design of the exit lane and surrounding area to ensure that unauthorized entry does not occur. Exit lanes must be securable when not in operation.

Unique solutions—such as adding revolving doors or turnstiles, closed-circuit television (CCTV) systems, and/or breach alarms—have been deployed to secure exit lanes. These solutions must allow sufficient space to accommodate the equipment as well as passengers with baggage and/or passengers with disabilities. Another solution is using clear glass panels when an exit lane is adjacent to the checkpoint; this helps deter breaches since the exit lane would be highly visible by TSA and airport/airline personnel. These elements can be combined to create an integrated system that utilizes video cameras, video monitors, sensors, and breach alarms concealed within the architectural elements and tied to a centralized system. This would further tighten security around this sensitive area without relying solely on manpower. In new facility planning and design, SSCP exit lanes should be a considerable distance from boarding gates to allow sufficient time to resolve a breach if one should occur.

3-6 Known Crewmember® (KCM)

The KCM program is a joint initiative between Airlines for America (A4A) and the Air Line Pilots Association, International (ALPA). KCM ties airline employee databases together in a seamless way and enables TSOs to positively verify the identity and employment status of crewmembers in real time.

KCM creates a dedicated screening location and alternative screening procedures for crewmembers to positively verify their identity and employee status in real-time. The crewmembers enter established checkpoints at designated checkpoints, exit lanes, or other direct access portals to facilitate the entry into the sterile area of an airport. KCM screening locations should be equipped with a table, chair, podium, duress alarm, and phone. Design considerations for an optimized KCM include:

- Number of positions required based on volume
- Electrical and data line requirements for each terminal
- Optimized access control points for KCM and other groups
- CCTV considerations

This identity-verification and employment-confirmation system for airline pilots (some air carriers include flight attendants) enhances checkpoint screening efficiency by removing airline crewmembers from passenger screening lines. KCM lanes must be secured when not in operation.

3-7 Federal Inspection Service (FIS) Checkpoints

With the exception of Pre-clearance inbound passengers, arriving international passengers are required to undergo U.S. screening before transferring to a domestic flight because the U.S. screening process has different requirements and provisions than screening processes at non-U.S. origins.

Some airports with international flights may decide to have a dedicated FIS checkpoint specifically for arriving international passengers transferring to domestic flights. This requirement depends upon capacity and the willingness of the airport. The screening requirements for a FIS checkpoint are the same as other checkpoints, but the volume varies based on the frequency of inbound international flights.

Requirements Summary Table – SSCP Boundaries and Exits from Secure Side

SSCP Boundaries	
Section 3-4	All walls adjacent to the non-sterile side or running the length of the side of the SSCP need to be at least 10'-0" high to prevent the passage of prohibited items from the non-sterile area to the sterile area
	Front walls separating the SSCP from the non-sterile area should be securable when screening operations are not occurring.
	Proper TSO egress must be provided if there is inadequate room for an access gate.
	A 10'-0" high or full-height wall should be installed from the entrance of the TDC to the exit of the checkpoint beyond the screening equipment into the sterile area.
	When an airport is installing a space for future lanes, the area between proposed and future space shall be separated by a 10'-0" high or full-height temporary wall.
	Securable Access
	Swing Doors: Larger checkpoints with multiple TDC positions require an opening of approximately 14'-0" per two-lane module set if in plane with the TDC podiums.
	Sliding Doors/Grills: Bottom track must be secured to prevent intrusions.
	Sectional Doors: Stacked leaves must be unobtrusive.
	Roll-up Doors or Grills: Roll-ups must be security type with anti-pass features such as polycarbonate infill or solid slats.
	Access Scalability
	Large checkpoints must have the capability to prevent passengers from accessing unused lanes and circumventing screening.
	Barriers must be at least 5'-0" in height and extend from the first fixed divest point on a lane to a fixed element or hard barrier at the TDC positions.
	Barriers are to be movable or removable to allow passengers to circulate between staffed lanes.
	Barriers shall be provided at one per every four lanes of screening.

Exits From Secure Side	
Section 3-5	Exits must be easily identifiable without adversely affecting security.
	Exits must be adequately sized for deplaning passengers exiting the concourse
	Exits must meet all building code egress path requirements.
	A minimum 10'-0" or full-height wall is required to separate the checkpoint from the exit lane. *Note: This requirement should be coordinated with the Airport Authority when a new checkpoint is being discussed or an existing checkpoint is being reconfigured and the exit lane needs to be modified.*
	Exit lane should be equipped with table, chair, podium for person to monitor area, and duress alarm.
	Monitor should be located so that traffic attempting to enter the exit lane from the wrong direction can be intercepted.
	All solutions must allow sufficient space to accommodate the equipment as well as passengers with baggage and/or passengers with disabilities.
	For new facility planning/ design, exit lanes should be a considerable distance from boarding gates to allow sufficient time to resolve a breach.

4 Checkpoint Approach and Passenger Queue

The checkpoint approach and passenger queue zones play an integral part in passenger experience and a critical role in determining screening time. This section outlines requirements and key considerations for planning the checkpoint approach and passenger queue.

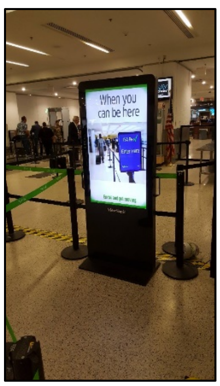
Revision	Date	Description of Changes
0	12/17/2018	Initial Publication

4-1 Pre-Screening Preparation Instruction Zone

The Pre-Screening Preparation Instruction Zone begins as early as the curbside ticket counters and typically ends at the Travel Document Checker (TDC). This zone should incorporate architectural features of the airport and be designed to provide a passenger environment with reduced noise, comfortable lighting, adequate spacing, and other calming features. Signage, instructional videos, and "ambassador" staff or volunteers, when available, should be used to enhance the ease movement through the Security Screening Checkpoint (SSCP).

Passenger Preparation for the Screening Process

Passenger preparation and divest coaching during the queue waiting process has the ability to substantially reduce screening time. Video monitors or video walls in the passenger queue can prepare the passengers for the standard screening process if deployed in an effective manner. The videos provided by TSA Headquarters (HQ) can be played on a continuous loop or be motion activated. Viewing distance is a factor with video presentations; video monitors should be close enough that the passengers receive the information presented, and spaced so the passenger is never out of sight of the next monitor. If a suitable location is not available close to the queue, a video wall could present the information. The video wall has the benefit of addressing the entire queue instead of groups of passengers at a time. Video presentations can include interactive avatars to answer specific passenger questions as they approach divest.



TSA Signage

Signage is not typically part of a checkpoint design but space should be allocated for signage when designing a new checkpoint. Simple and effective checkpoint signage approved by TSA HQ Public Affairs can direct and instruct passengers on screening requirements and procedures. TSA signs are available as 11" x 14" or 22" x 28" frames that can be mounted on top of a floor stanchion. The four categories of signs are TSA Mandatory Signs, TSA Instructional Signs, TSA Directional Signs, and TSA Local Signs. Refer to the most current version of the TSA Airport Signage Guidelines, available on the TSA Intranet, for specific sign descriptions and where to locate these signs within the checkpoint.

TSA Mandatory Signs

TSA mandatory signs display critical information and TSA policies. These signs need to be visible from both sides, prominent, easy to read, and located along the path of departing passengers without obstructing queue lanes or being a safety hazard. These signs should not be clustered together in a way where larger signs block smaller signs or where multiple instructions create information overload for the passengers.

TSA Instructional Signs

TSA instructional signs provide passengers with instructions on the screening process. These signs advise passengers on how to properly divest their possessions and how to place those items in the bins. TSA Instructional Signs can be mounted in the same way as the TSA mandatory signs or displayed on walls near the divest tables.

TSA Directional Signs

TSA directional signs instruct passengers where to go during the screening process, including providing direction to separate queue and screening lanes. The goal is to provide clear and concise directions so that passengers react quicker and overall time in the queue is minimized. Directional signs must be elevated so they are easily visible and not obstructed by passengers standing in line.

TSA Local Signs

TSA local signs are designed to meet specific local requirements, such as instructions regarding special equipment, local processing instructions, and any other information deemed necessary by the local Federal Security Director (FSD). All requests for custom signs to meet local needs or edits to existing national signs should be submitted to OSO.communications@tsa.dhs.gov.

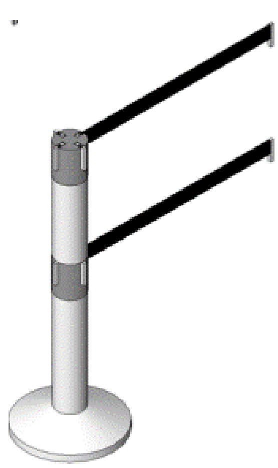
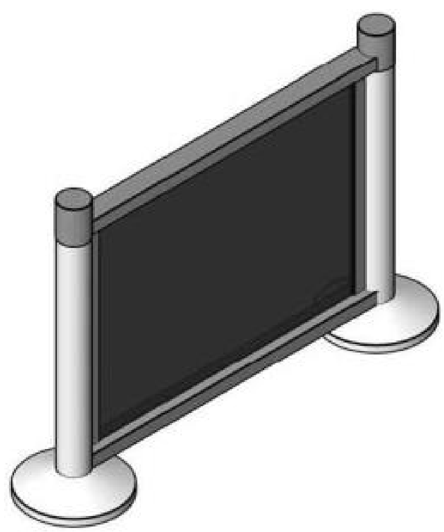
Automated Wait Time

Automated wait time is a technology that actively monitors and reports wait times at various checkpoints in the airport. The systems use various protocols to measure when passengers enter the checkpoint queues and then exit the screening area. This wait time data can then broadcasted to the passengers, typically through a video display at the entrance(s) to the checkpoint queue. Passengers are then able to make informed decisions on which checkpoint would be in their best interest to use. The information can also be included in non-secure side airport areas, so that once check-in is completed passengers can make their decision in the check-in areas. This technology is currently provided by the project sponsor, not TSA.

> *The FAA Reauthorization Act of 2018 requires TSA to report real-time wait times at SSCPs both online and in physical locations at checkpoints. TSA is exploring systems that not only communicate real-time wait times to meet the guidelines set forth in the Act, but also provide additional data on the screening process. TSA will issue guidance as it is developed.*

4-2 Passenger Queue

The queue is where passengers stand in line at the front of the checkpoint on the non-sterile side. The airport is responsible for all stanchions and hard panel barriers in the queue prior to the TDC (exception with canine expedited screening [CES]). It is recommended that the queue be bound by solid barrier stanchions on the perimeter and double strap stanchions inside the perimeter to define the queuing lanes from the queue entrance(s) to the TDC(s)/Credential Authentication Technology (CAT). Queue lanes are approximately 3'-0" to 7'-0" wide, depending on the queue lane function and the queue space available.

Strap Stanchion	Solid Barrier Stanchion
	

TSA recommends 600 square feet in the queue for every checkpoint lane as outlined in the lane layout PDF and CAD files. The queue should be large enough to meet the peak passenger demand without interfering with other functions in the terminal such as the ticket counter or checked bag processing. A queue entrance should remain open at all times. Queues should be able to be cordoned off and funneled down to one TDC during off-peak times.

The exclusive use of strap stanchions is inadequate to fully secure the checkpoint. Solid barrier stanchions are required along the boundary of TDC/CAT podium positions and the flanking side limits of the queue.

Stanchions Information Sheet	Overview of stanchion types, pros and cons of each, and graphic examples	Stanchions Info Sheet.docx

Queue Management

The queue and its management are the airport's responsibility but must be able to accommodate TSA programs such as TSA Pre✓® and Canine Expedited Screening (CES). Appropriate boundaries must be maintained for each type of passenger circulating through the queue or TDC with flexibility and space to accommodate flex programs. This ensures that populations are segregated appropriately to ensure only low risk individuals receive TSA Pre✓® screening, but it is also vital to capacity management of the checkpoint. Increased wait times may result if the passenger queues are not managed correctly.

The next-generation of queue management will include several technologies focused on streamlining passenger queue navigation, screening process preparation, and securing the location.

Canine Expedited Screening (CES)

The local TSA will involve the Canine Program Office to review the queue layout and certify it for canine operations.

4-3 TDC and CAT

Prior to entering the security checkpoint for screening of persons and property, each passenger is required to have their identification and boarding pass validated at the TDC or CAT location. With TDC, security features and the boarding pass are verified. The CAT verifies the veracity of the identification, and electronically verifies the boarding pass.

The TDC/CAT function is critical to the flow of passengers through the checkpoint, as it can become the bottleneck in the passenger screening process. To prevent this, the queue must be set up properly to feed the TDC/CAT, and the TDC/CAT must be set up properly to feed the checkpoint lanes.

The following guidelines should be considered when determining placement of the TDC/CAT:

- The TDC/CAT, hard building walls, and solid barrier stanchions should be set up to prevent unauthorized entry and prevent circumvention of the TDC
- The TDC/CAT should be located with enough space from the screening lanes to allow passengers to cross-flow to a lane of their choosing.
- Lighting should be sufficient for reading documents; a minimum luminance level of 30 foot-candles (fc) is required, 60 fc is recommended.
- There should be space and infrastructure available to accommodate two TDCs per lane for future expansion of Biometric Authentication Technology (BAT), CAT, and other future technology considerations.
- Sufficient clearance should be provided between the queue stanchions and the TDC/CAT stanchions at a clearance of 6' so that passengers can cross-flow to a TDC/CAT of their choosing.

TDC and CAT Spec Sheet	Information, side and elevation views, etc.	Spec Sheet_TDC and CAT.docx
IDEMIA E-CAT Cart Spec Sheet	Dimensions, various views (front, side, isometric), etc.	A100-000021_Rev_D_June2018.pdf

5 Passenger and Carry-On Baggage Screening

With approximately 730 checkpoints in existence today, equipment arrangements vary based on the approved approach at the time of implementation at the checkpoint. Site conditions and local input also impact the layout of a checkpoint. TSA intends for each arrangement to meet baseline standards based on the current threat; however, these standards change often as new capabilities emerge to address future threats at all category airports. This section outlines the requirements and considerations to be made when designing layouts.

Revision	Date	Description of Changes
0	12/17/2018	Initial Publication

5-1 SSCP Layouts

As noted in Section 3-1, checkpoints consist of standard one- or two-lane module sets or combinations of standard module sets based on a particular arrangement of a given type and quantity of screening equipment that have been previously qualified by TSA. The two-lane module set is the same as a one-lane module set with the addition of another Advanced Technology (AT) X-ray opposite the first X-ray and the other equipment being located between the two lanes. The equipment between the lanes is known as the “infield” equipment. Opposite the X-ray lane, where the Transportation Security Officers (TSOs) work, is known as the “back-to-back operator space.” A two-lane module set or a combination of two-lane module sets is the best approach for configuring a checkpoint because it efficiently utilizes screening equipment and TSA personnel. However, a one-lane module set should be used if the peak passenger load only supports one lane, the checkpoint has an odd number of lanes, or there is an obstruction—such as a column, electrical closet, or chase—that prevents adding a two-lane module set.

All designs for new checkpoints or reconfigured existing checkpoints should be based on the module sets of an arrangement prescribed by the TSA Headquarters (HQ) checkpoint design standards. A graphic representation of the arrangement is presented the **Example SSCP Layout** figure below. Generic ATs and Advanced Imaging Technology (AIT) units were used in the module sets and arrangements, but any manufacturer included in this guide can be applied using the same recommended spacing. Some adjustments to the layout may be required to account for different equipment dimensions.

The checkpoint designer must evaluate the structural floor prior to placement of the TSE, as the live load a floor system can support varies. Section 9 provides additional information on this topic. Designers are reminded to consult applicable codes within the airport’s jurisdiction to determine the applicability of seismic restraints for all brands. OEMs have brackets available for purchase.

SSCP Arrangement

The following figures represent the current and future SSCP arrangements. The dimensions contained in the CAD and PDF files provided in Appendix A serve as guidelines to lay out a checkpoint. (Appendix A is available on the FedBizOpps.gov website, co-located with this CRPG.) Every attempt to achieve the dimensions listed should be made when designing a checkpoint. The spacing requirements are the same regardless of the make and model of the screening equipment used.

Example SSCP Layout – Standard

Example SSCP Layout – Future

5-2 Divest Table

Divest tables are provided for passengers to stage their bins side-by-side so they can deposit their personal items into the bins. The divest table allows passengers to slide their bins to the infeed of the X-ray.

Divest Table Info Sheet	Dimensions, various views (isometric, elevation, and plan), etc.	Divest Tables Info Sheet.docx

5-3 Barriers

To prevent passengers and items from passing into the sterile area from the non-sterile area without being screened, barriers must be installed to close all gaps exceeding 8" across the front width or façade of the checkpoint.

Barriers Info Sheet	Dimensions, various views (isometric, elevation, and plan), etc.	Info Sheet_Barriers.docx

5-4 Americans with Disabilities Act (ADA)/Access Gate

The ADA gate on the passenger side is part of the line that separates the non-sterile area from the sterile area. The ADA gate allows passengers that cannot otherwise traverse the Walk-Through Metal Detector (WTMD) or AIT to reach the sterile area. The ADA gate is typically used by wheelchair passengers, passengers requiring special assistance, or passengers with pacemakers. These passengers are brought from the queue through the ADA gate and taken immediately to an area for secondary screening.

The access gate on the operator side is also part of the line that separates the non-sterile area from the sterile area. It is used only by TSA staff, as a travel path that is free and clear of passengers, to access the sterile side and return bins from the composure/extension rollers to the divest tables.

ADA/Access Gate Info Sheet	Dimensions, various views (elevation and plan), etc.	Info Sheet_ADA Gate.docx

5-5 Advanced Technology (AT)

The AT X-ray is the current generation of X-ray equipment. TSA currently classifies the baggage screening equipment as AT. AT represents the deployment of the AT X-ray units, consisting of the Rapiscan 620DV and the Smiths 6040aTiX. AT includes an Alternate Viewing Station (AVS). The AVS is where a TSO can recall the image of an alarmed bag from the AT while performing a targeted bag search.

The Rapiscan and Smiths AT units come standard in a right hand (RH) configuration but can be modified into a left hand (LH) configuration. The "hand" is dependent on the bump-out orientation. The bump-out is the side bonnet on the AT X-ray that juts out from the main rectangular shape. When standing on the non-sterile side of the AT looking at the infeed tunnel, the bump-out is on the right side of the AT main body on RH unit, and on the left side of the main body for a LH unit. The RH and LH AT units are not symmetrical. The LH AT is a 180° rotation of the RH AT with the infeed and outfeed components interchanged. The bump-out orientation should be specified prior to manufacture of the unit.

The operator workstation is independent of the bump-out and can be positioned on either side. This is often referred to as LH operator or RH operator, and the orientation is determined the same way as the bump-out. Operator orientation needs to be determined prior to manufacture of the unit.

It is important to identify the orientation of the bump-out and the location of the operator early on so that the AT unit can be manufactured as designed; it is arduous and expensive to change in the field. The four possible orientations of the Rapiscan and Smiths ATs are as follows:

- RH AT with bump-out toward operator
- RH AT with bump-out toward passengers
- LH AT with bump-out toward operator
- LH AT with bump-out toward passengers

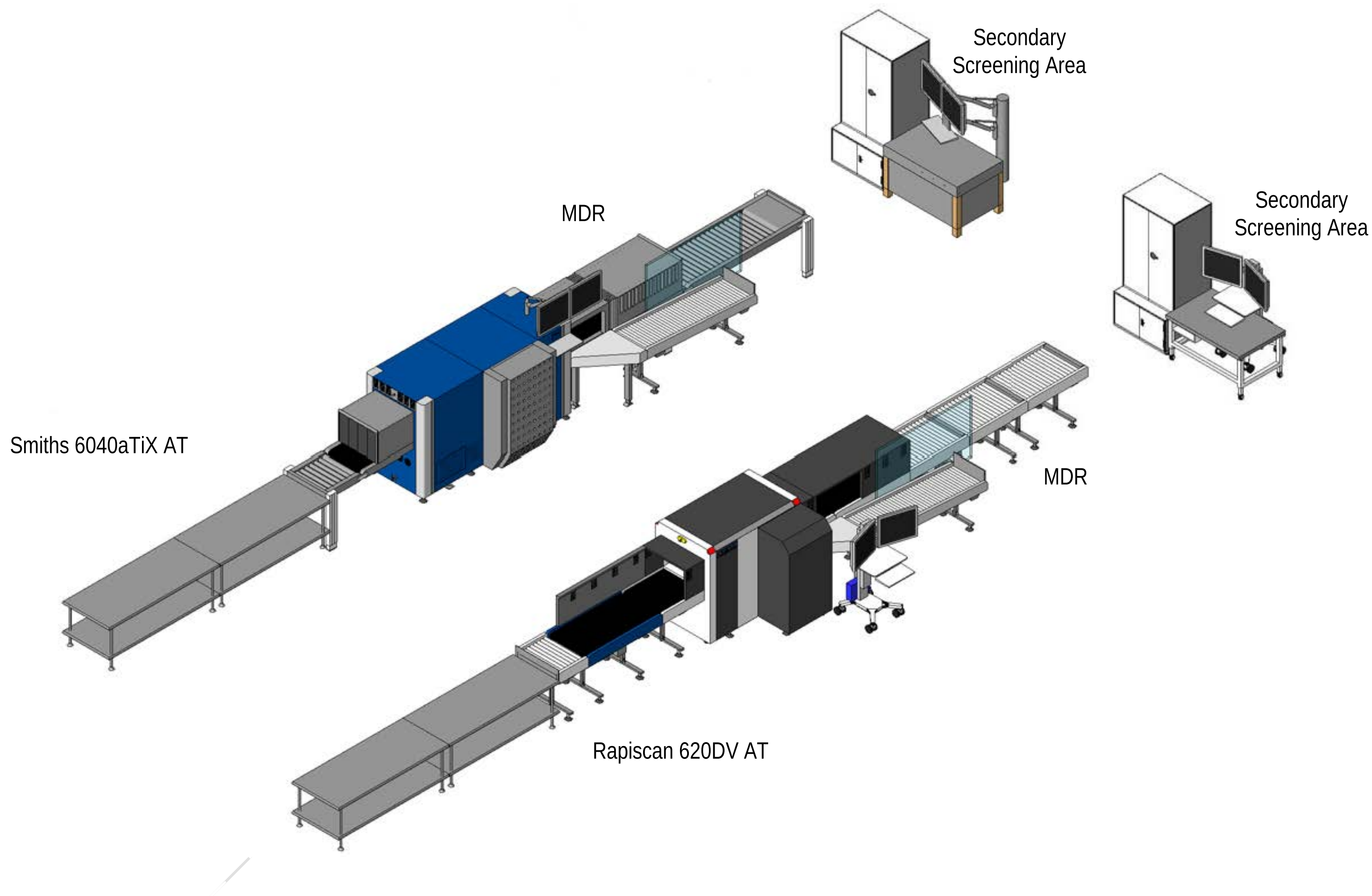
The AT units are also unique in regard to the composure length. AT extension rollers should be added to obtain the recommended divest and re-composure length of 12'-0" (with a maximum divest and re-composure length of 18'-0").

Field-verify the equipment type, bump-out orientation, and operator location early in the process to avoid costly and time-consuming delays.

If existing equipment cannot be installed in its original configuration, work orders must be submitted for its reconfiguration.

Rapiscan 620DV AT and AVS	Overview of equipment, quantity requirements, various views (plan, elevation, side), and additional information	Spec Sheet_AT AVS_Rapiscan.docx
Smiths 6040aTiX and AVS	Overview of equipment, quantity requirements, various views (plan, elevation, side), and additional information	Spec Sheet_AT AVS_Smiths.docx

AT Units


Secondary
Screening Area
Secondary
Screening Area
MDR
Smiths 6040aTiX AT
MDR
Rapiscan 620DV AT

5-6 Diverter Roller

The manual diverter roller (MDR) is a non-powered, gravity fed, stand-alone roller located on the operator side of any AT unit at the alarm bag cutout. The automated diverter roller (ADR) is a powered transfer roller paired with Computed Tomography (CT) units. A combination of MDR, ADR, and/or 2'-0"x2'-0" tables may be used, depending on the checkpoint configuration.

MDR Info Sheet	Dimensions, various views (isometric, side, elevation), etc.	Info Sheet_MDR.docx
ADR Info Sheet	Dimensions, various views (isometric, side, elevation), etc.	Automated Diverter - Z5594101-Z1_1_Rev:

5-7 Walk-Through Metal Detector (WTMD)

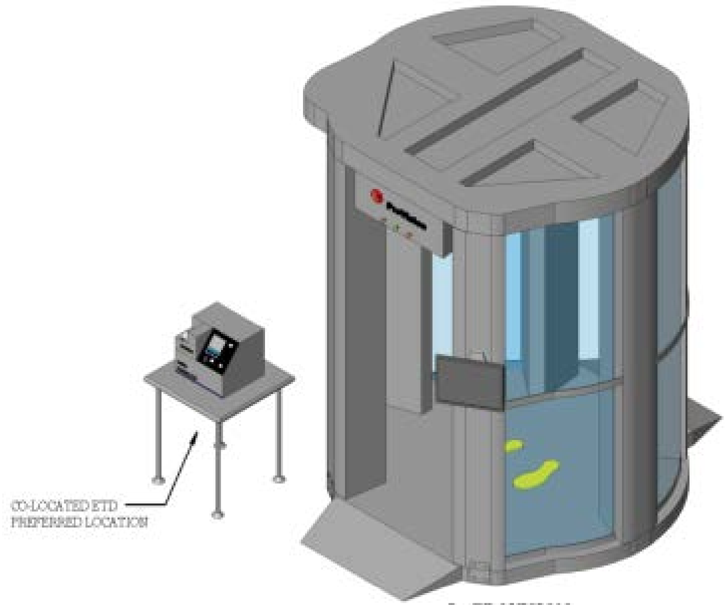
The WTMD is used for passenger screening. It is an archway used to detect concealed metallic items and/or contraband. Currently, only OEM and authorized service providers are certified and authorized by TSA to relocate, recalibrate, service, and relocate the power cord to the opposite leg of the WTMD.

To minimize environmental and equipment interference with the WTMD, the following guidelines should be applied:

- Locate a WTMD a minimum of 24 inches away from all electrical fields created by escalators, trains, conveyors, neon fixtures, speakers, transformers, banks of electrical circuit breakers, conduit, wire, and receptacles both overhead and beneath the floor. Higher voltages will require additional clearances, and checkpoints should never be located above facility electrical distribution rooms.
- Minimize interference from metal in surrounding architecture, including floors, floor supports, doors, metallic framing, wall studs, façade systems, and columns.
- Avoid locating the WTMD across expansion joints or in an area prone to surface vibrations created by equipment above, below, or immediately adjacent to the checkpoint such as baggage conveyors, subway trains, heavy truck traffic, etc.
- With floating or raised floors, a 10'x10' concrete pad will be required under the WTMD to eliminate excessive vibrations.
- For the currently deployed WTMD, a twist-lock receptacle helps to prevent the WTMD from being accidentally disconnected, which drains the backup battery.
- When relocating a WTMD, field-verify the receptacle type to ensure the correct power supply and cord are available in the new location.
- The 13'-0" power cord tight to the barrier on the sterile side adjacent to the WTMD to prevent the cord from being run across passenger egress or TSA work paths where the cord is likely to be a trip hazard or become damaged.
- Silicone and/or bolt the WTMD to the floor.

WTMD Spec Sheet and Design Guidelines	Dimensions, various views (plan, side, elevation), etc.	Spec Sheet_WTMD_CEIA.(

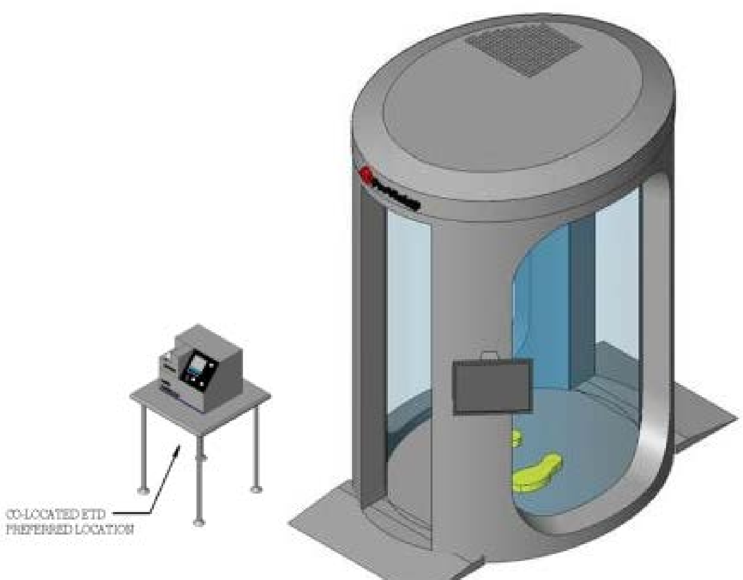
5-8 Advanced Imaging Technology (AIT)



L3 PROVISION
ISOMETRIC VIEW

The AIT provides an additional element of passenger screening by being able to detect a broad spectrum of materials concealed in or under a passenger's clothing. The current manufacturer deployed today is the L3 ProVision, whose portal uses millimeter-wave imaging technology, similar to the type of waves a cell phone emits, to detect items in question.

TSA uses the L3 ProVision AIT and ProVision 2 AIT2 units; the ProVision 2 provides the same imaging technology as the ProVision, but in a smaller unit. Designers are recommended to follow the same checkpoint dimensional requirements for the L3 ProVision and L3 ProVision 2.



L3 PROVISION 2
ISOMETRIC VIEW

It is best to provide power for the AIT and corresponding Uninterruptible Power Supply (UPS) from under an adjacent AT X-ray lane. The UPS should be located such that it is not a trip hazard to passengers or to the AIT operator at the Touch Control Operator Panel (TCOP). When a barrier is located between the L3 AIT control leg and the AT, the AIT power cord can extend to the receptacle under the infeed or outfeed conveyors of the AT along the barrier in an appropriate surface-mounted raceway. In some cases, an ADA gate or a WTMD is located between the L3 AIT control leg and the AT. Extending the AIT power cord across passenger flow is a safety hazard and is not acceptable. For the L3 AIT only, when all other options have been exhausted, the unit can be rotated 180 degrees in order to locate the control leg adjacent to a barrier so that the cord can be extended along the barrier in an appropriate surface-mounted raceway. When there is passenger flow on both sides of the AIT, such as an ADA gate and a WTMD, the potential exists for tripping, damage to cords, or unplugging of equipment. In this case, a separate power device should be provided for the AIT and co-located Explosive Trace Detection (ETD) unit. Designers should review and understand the L3 AIT cord lengths to avoid unnecessarily rotating the AIT.

Designers are reminded to consult applicable codes within the airport's jurisdiction to determine the applicability of seismic restraints for all brands. Brand manufacturers have brackets available for purchase.

Co-located ETD at AIT

ETD units on a movable stand, cart, or table are located at the exit of the AIT to perform additional screening. The ETD units can be on either side of the AIT exit depending on the location of the power/data. The ETD unit should be fed from the same electrical device as the AIT, but remain separate from the AIT's dedicated circuit. Designers are advised to provide power and data for the ETD unit when developing construction drawings to provide maximum installation flexibility for the optional ETD function.

Slope Tolerance

An AIT can be installed on an inclining or a declining floor within the maximum manufacturer-recommended slope. Depending upon the slope of the surface the system is installed on, the inner floor of the ProVision system will also be at an angle. These tolerances pertain to the technical functionality of the equipment and do not take into account building codes or ADA accessibility. To ensure accommodation of ADA passengers, designers should consult enacted codes in the jurisdiction.

The L3 ProVision system can be operated as follows.

- If the floor slope is parallel to passenger travel, the comfortable maximum floor slope is 3.6% for an AIT1 and 2.8% for an AIT2.
- If the floor slope is perpendicular to passenger travel, the L3 AIT cannot be installed unless the unit can be rotated parallel to the slope. This may be possible at checkpoints with unique shapes.
- At the aforementioned maximum 3.6% slope, the internal floor of the L3 AIT would have a 1:20 slope after adjusting the downhill leveling screws to their maximum extension. In the normal scanning position, this is equivalent to standing with one foot elevated approximately 1" relative to the other and is not normally noticeable.

At the upper maximum slopes, compensatory steps such as leveling the machine's feet and/or adjusting the floor mat position may be necessary. Designers should contact the manufacturer's representative for more information when installing on a sloped floor.

L3 Provision AIT	Plan views and additional information	Spec Sheet_AIT_L3.docx
L3 Provision AIT2	Plan views and additional information	Spec Sheet_AIT2_L3.docx
L3 AIT vs. AIT2 Sizing	Provides dimensions and overlay to compare L3 AIT to AIT2 sizing	AIT vs AIT2 Sizing.pdf

5-9 Composure/Extension Rollers

TSA recommends a standard 12'-0" composure length, which can be any combination of extension rollers or exit rollers depending on the manufacturer of the AT or CT.

5-10 Secondary Screening

Secondary screening is additional screening that may be required for passengers and their bags when they alarm primary screening equipment. The area is approximately 3'-0" to 5'-0" from the end of the screening lanes in order to minimize the travel time and distance that TSOs have to carry bags. Secondary screening is typically located in the "dead" operator space on back-to-back lanes or at the end of the lane for odd-numbered lanes. This area should be clear of exiting passengers. The current secondary screening area typically consists of an ETD unit, Bottled Liquids Scanner (BLS), AVS, mobile cabinet, and search table.

Secondary Screening Area – Current

Secondary Screening Area – Future

Secondary Screening Area – Future	RWS Preferred Set-up.dwg	RWS Preferred Set-up-Layout1.pdf

Explosive Trace Detection (ETD) and Bottled Liquids Scanner (BLS)

ETD units are used to swab carry-on bags that have alarmed at the AT. These ETD units should be contained within a mobile cabinet but can sometimes be found sitting directly on a search table. The ETD machines require operational, testing, and maintenance supplies to be located within arm's reach of the working area. If a mobile cabinet is not used, then alternative storage is required. ETD manufacturers and their specifications are listed in the **General ETD and BLS Spec Sheet** embedded below. The ETD units should be co-located with one search table for a single lane and two search tables for back-to-back lanes. These same ETDs are also located at the exit of AIT units as a method of secondary screening for passengers who alarm the AIT. This is referred to as an AIT with Co-located ETD. Refer to Section 5-8 for additional information.

ETDs are extremely sensitive to environmental conditions such as temperature, humidity, and air quality. ETDs should be clear of fumes and exhaust to prevent malfunctioning. The ETD units also have a high heat output and should be vented if placed in a non-standard TSA storage device.

Bottled Liquids Scanners aid TSA in identifying explosive, flammable, or hazardous substances that have been concealed in a benign container. The containers do not have to be open for the analysis to be performed. Using Raman spectroscopy (laser) and electromagnetic technology, BLS units quickly analyze and identify the chemical compositions of a wide variety of solids and liquids, including explosives that are currently on the classified threat list. Manufacturers and the procurement specifications are listed in the spec/cut sheets below, with the ETDs.

General ETD and BLS Spec Sheet	Overview of manufacturers and additional information	Spec Sheet_ETD and BLS.docx
Ionscan 500DT_Smiths	OEM cut sheet	ETD_Smiths Ionscan 500DT_TSA Cut Shee
Implant Sciences QS-B220	OEM cut sheet	ETD Implant Sciences Cut Sheet.pdf
CEIA BLS	OEM cut sheet	CEIA_BLS_200K0002 v_Cut Sheet.pdf
RespondeR RCI_Smiths	OEM cut sheet	RespondeRRCI_Smiths_Cut Sheet.pdf
RespondeR BLS_Smiths	OEM cut sheet	RespondeRBLS_Cut Sheet.pdf

Mobile Cabinets

Mobile security cabinets provide a secure and vented storage area for secondary screening equipment. The ETD mobile cabinet—common in the field today—encloses the ETD and its associated operational, testing, and maintenance supplies. The ETD-BLS mobile cabinet will enclose the ETD and BLS and house the operational, testing, and maintenance supplies for both systems.

The cabinets have wheels for easy relocation, but the wheels should be locked when the ETD and/or BLS is in operation. Power/data receptacles for the secondary screening area should not be located under the mobile cabinets because the bottom of the cabinet does not provide enough clearance for devices or plugs.

5-11 Bag Search Table

Bag search tables are used for target bag searches, ETD swabbing, and BLS testing. Their stainless steel surface provides a clean, contaminant-free surface. Bag search tables are also equipped with wheels for easy relocation, but the wheels should be locked is a table is in use. The back and side panels offer privacy during bag searches, but may be removed when the bag search table is located with an AVS. Existing bag search tables are 30"x48". Future bag search tables may be 30"x48" or 30"x72" and will be bespoke to the Automated Screening Lane (ASL) unit.

5-12 Passenger Inspection

Private Screening Rooms (PSRs)

Passenger inspection can occur at the screening lanes, at the secondary screening area, or in a private room at or near the checkpoint. PSRs should be installed by the airport using conventional construction and should meet the general minimum requirements of the passenger inspection kit as well as all code requirements. The local TSA is responsible to ensure all PSRs have a mirror available so passengers can re-don bulky headwear and/or similar apparel.

The standard size of the PSR is 8'x11'. The intent is to have code-compliant accessibility and a semi-permanent work surface/table and chair for screening. Proper lighting and heating, ventilation, and air conditioning (HVAC) are main issues and should be addressed with the PSR. Where possible, the PSR shall be adjacent or immediately adjacent to the checkpoint. Because built-in PSRs must meet all local and national code requirements, rooms provided by airports not originally purposed for general public use shall be improved prior to use as a PSR. Regardless of the location and type of the PSR, security cameras should not have a view into the PSR and the PSR should be opaque. The following four options for the project sponsor–built PSRs are allowed under this guide:

1. Built-in
2. Retractable rigid panel rooms
3. Expandable curtain
4. Ceiling-mount curtain

5-13 Composure Bench

Seating at the checkpoint egress allows passengers to put their shoes and jackets on and consolidate their personal belongings after completing the screening process. Airports may purchase their own composure bench. TSA provides composure benches approximately 7'-0" from the AIT screening area. Generally, to have composure benches in the checkpoint infield, an area 14'-0" or greater is required. This area is typically out of the main passenger flow. The figure below shows the dimensions of the TSA-provided composure bench.

5-14 Supervisor Podium

The Supervisory Transportation Security Officer (STSO) should be positioned at a podium on the secure side of the checkpoint. Smaller checkpoints can place the STSO at a standard podium. Ideally, larger checkpoints may have a podium built in by the project sponsor, like the one shown in the **STSO Podium** embedded file, near the checkpoint exit. The STSO should be able to perform administrative duties while viewing and supervising the entire screening operation. The location should have an unobstructed view of the checkpoint.

Supervisor podiums have the highest functionality when they are built into the back of the checkpoint. It is recommended that the finishes of the built-in podiums blend with the terminal and checkpoint construction. An elevated podium floor (18" from the level of the checkpoint) is optimal for security. The podium can be built on top of existing construction with lightweight wood construction. It should include a screen wall facing the checkpoint with a built-in computer counter. Power and data requirements must be reviewed for each case.

STSO Podium	Dimensions and quantity per lane	Spec Sheet_STSO Podium.docx

5-15 Equipment Dimensional Criteria

As a guide for designing single-, two-, or three-lane checkpoints and determining equipment placement for multiple lane configurations, TSA provides example checkpoint layouts with different manufacturers' equipment. Multiple configurations are possible; not all configurations may be depicted. When the architect completes the design, the dimension strings must be maintained. The TSA designer can answer questions and provide additional information. The TSA-provided PDF and CAD design examples are presented in Appendix A (available on the FedBizOpps.gov website, co-located with this CRPG).

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6 TSA Certified Transportation Security Equipment (TSE) (Emerging Technology)

Designs must be sufficiently adaptable to meet changing threats and support emerging technology. If the original design has anticipated the need for change and planned provisions for expansion, accommodating changes to security screening equipment dimensions, electrical and data infrastructure requirements, and/or processes is much easier.

This section provides an overview of the TSE that is certified–but not yet qualified–so that these future planning considerations may be made where possible. Certified equipment is TSE that has passed testing (i.e., meets certain performance parameters such as detection and false alarm rates) at the Transportation Security Laboratory (TSL) and is ready for operational test and evaluation in the field. This equipment ***cannot*** yet be procured for use in security screening.

> *Planning for future technologies allows flexibility and cost-savings but there is also risk—certified technologies do not all become qualified TSE, and specifications may change throughout the development and testing processes. Communicating regularly with TSA designers will ensure potential issues are identified and mitigated in a timely manner.*

Revision	Date	Description of Changes
0	12/17/2018	Initial Publication

6-1 Passenger Authentication

Travel Document Checker (TDC) – E-Gate – Biometric Authentication Technology (BAT)

The next-generation of passenger identification and authentication will include technologies for reducing staffing demands and increasing passenger throughput. New technology may augment TDCs and Credential Authentication Technology (CAT) with an e-gate self-authentication option, where validated passengers enter the checkpoint via BAT with minimal aid from a Transportation Security Officer (TSO). Similar to self-check-in kiosks, passengers would scan credentials, self-authenticate, and enter the checkpoint through a control point. Gated kiosks would be deployed with the self-authentication process for access control. BAT will provide a higher level of security for the authentication process. The biometric authentication options are currently under consideration and examination.

Biometric Authentication Example Video	Available on the FedBizOpps.gov website, co-located with this CRPG

6-2 Computed Tomography (CT) Scanner

The next-generation of carry-on baggage screening may include CT X-ray (or CT) scanning. CT provides three-dimensional images of bag contents, as well as solid and liquid explosives detection. CT scanning can eliminate the need for passengers to divest liquids from bags. Some CT systems will require additional infrastructure and higher voltage service in the lanes.

L3 ClearScan	Quantity and additional information	Spec Sheet_CT_L3 ClearScan.docx

L3 ClearScan 3D Renderings	Elevation and plan views	CT_L3 ClearScan_Elevation a
IDSS Detect 1000	Quantity and additional information	Spec Sheet_CT_IDSS Detect.docx
IDSS Detect 1000 3D Renderings	Elevation and plan views	CT_IDSS.docx
Analogic ConneCT	Quantity and additional information	Spec Sheet_CT_Analogic C
Analogic ConneCT 3D Renderings	Elevation and plan views	CT_Analogic ConneCT.pdf
Smiths Hi-Scan CTiX	Quantity and additional information	Spec Sheet_CT_Smiths Hi-S
Smiths Hi-Scan CTiX 3D Renderings	Elevation and plan views	Smiths Hi-Scan CTiX 3D Renderings.docx
CT OEM Comparisons	CT OEM Comparisons	CT OEM Comparison.dwg; CT OEM Comparison.pdf

Slope Tolerance

Many limiting factors prevent a CT from being installed on an inclining or a declining floor. The table below provides slope tolerances by system.

CT Slope Tolerances	Slope Tolerance - CT.docx

6-3 Automated Screening Lanes (ASLs)

The next generation of passenger screening management will include ASLs. These systems reduce the need for TSO oversight of bins, allowing more effective use of checkpoint staffing. The ASL systems would improve passenger management to eliminate congestion in divest and composure areas. The systems can display multiple bag resolutions simultaneously and offer multiple stations for secondary screening of reject bags. The ASLs are flexible with modularity in divest, buffer, and re-vest positions, as well as line offsets to avoid obstructions such as structural columns. However, the bin return conveyor being under the bag scanner limits where power and data infrastructure can be located.

Example ASL Divest Video	Available on the FedBizOpps.gov website, co-located with this CRPG

MacDonald Humfrey ASL	Quantity, additional information, and 3D layout	Spec Sheet_ASL_MacDona	
Scarabee ASL	Quantity, additional information, and 3D layout	Spec Sheet_ASL_Scarabee	
Vanderlande ASL	Quantity, additional information, and 3D layout	Spec Sheet_ASL_Vanderlai	
ASL Lane Comparisons	ASL Generic Lane Layout Comparisons	ASL Comparison.dwg	ASL Comparison.docx

Slope Tolerance

Many limiting factors prevent an ASL from being installed on an inclining or a declining floor. The table below provides slope tolerances by system.

ASL Slope Tolerances	Slope Tolerance - ASL.docx

ASL Image Operations (IO)/Remote Resolution (RR) Room

The next generation of automated bag screening will include enhanced resolution to increase throughput per lane. Currently, during peak operation hours, additional bag screening via remote resolution is expected to be 1.4 Full-Time Equivalent per ASL (subject to change in the future), but assessment of operations is required prior to final determination. Checkpoints of three or more lanes may qualify for remote resolution. Smaller checkpoints in airports with other checkpoints may be included in the shared solution. As part of the ancillary space requirements, the IO and RR rooms are non-leased space.

An ASL resolution room is expected to be a built-in room, preferably within 100' of the checkpoint. The airport is responsible to build the room, its associated infrastructure, and millwork for the stations. Data cable runs from the TSA Information Technology (IT) room must not exceed industry standard. ASL resolution rooms located between two checkpoints can serve both checkpoints. Rooms must have adequate Heating, Ventilation, and Air Conditioning (HVAC) to handle the equipment and personnel loads. Lighting must be controllable to reduce light levels during active screening. Additional infrastructure is required to support the necessary equipment. Carpet and acoustical tile ceilings are recommended to minimize sound levels. A separate workstation is required for each TSO, with privacy screens between workstations. Each workstation should have a dual flat-screen monitor in a flexible configuration and a work surface with drawer storage below.

Example ASL Remote Screening Room layouts are provided in CAD format in Appendix A. (Appendix A is available on the FedBizOpps.gov website, co-located with this CRPG.)

6-4 Enhanced Advanced Imaging Technology (eAIT)

The Rohde & Schwarz (R&S) QPS201 security scanner uses safe millimeter-wave radio frequency technology to screen passengers. The QPS system requires only a few milliseconds to scan passengers, which can speed checkpoint-screening operations and increase throughput. Privacy is protected by the use of a generic outline of a person to indicate to operators the location of an alarm. Individuals stand in front of the technology with their arms held slightly away from the body and the system automatically detects potentially dangerous objects on the body.

The R&S QPS201 is provided for informational and future planning consideration; however, it is not yet certified.

Rohde & Schwarz Enhanced AIT

Equipment	Quantity	Additional Information	OEM Cut-Sheet	CAD Files		
QPS201	Arrangement Dependent	An Explosive Trace Detection (ETD) unit is to be co-located with the AIT for additional passenger screening. The ETD can be located at or on the same side as the control leg.	QPS201_bro_en_3606-7160-12_v0301.pd	Monitor AutoCAD Mechanical V2004.d	Monitor.dwg	QPS201 AutoCAD Mechanical V2004.d

7 Electrical and Data

This section attempts to describe all the electrical systems required to support the non-leased space at the checkpoint. Familiarity with these requirements is essential when designing a new checkpoint or reconfiguring an existing checkpoint. The power requirements for each individual piece of security screening equipment are included in the **Power Requirements Table**. Data requirements can be found in the electrical diagrams embedded in Section 7-5.

Revision	Date	Description of Changes
0	12/17/2018	Initial Publication

7-1 Power Requirements

Most new technology added to checkpoints requires dedicated circuits—the airport should plan for this. The **Security Screening Checkpoint (SSCP) Power Connectivity Diagram** (embedded below) illustrates all equipment that must be connected to the SSCP power panel board. All checkpoint circuits should be located together in the same electrical panel or panels. The electrical engineer should not assume an existing circuit is dedicated, or expect the electrical contractor to trace an existing circuit to remove any excess load during construction. For new and reconfigured checkpoints, dedicated circuits should be provided for most security screening equipment. Each dedicated circuit should have its own neutral. There should be no common neutrals used for any checkpoint equipment circuits to prevent accidental overvoltage conditions and potential equipment damage in the event a neutral conductor is interrupted.

The electrical panel should be located in a secure area as close as possible to the checkpoint, accessible by TSA staff. New electrical panels should be designed to have 20 percent or more open space for future expansion. The standard voltage for SSCP equipment is 120/208 volts (V). SSCP panels can vary in size from 100 amps (A), 3-phase, 4-wire to 400A, 3-phase, 4-wire, depending on the number of lanes at the checkpoint.

During design, it is important for the Electrical Engineer to determine the existing electrical system capacity available for checkpoint equipment. Field verification of existing electrical panel loads and the availability of power to support new equipment loads is essential. The kilovolt-ampere (kVA) load of the various equipment can be found in the **Power Requirements Table** embedded below. Circuits from existing electrical panels should be used when available, as indicated by the panel board and corresponding panel schedule that serve the checkpoint. However, the panel schedule often lacks sufficient detail as to what equipment the circuit is feeding. There may be other loads already connected onto a supposedly spare circuit or even a circuit feeding checkpoint equipment. A load study of the intended checkpoint power source that satisfies the requirements of National Electric Code (NEC) 220.87 is strongly recommended.

In some cases, a new electrical panel may be required for new circuits to support a new or reconfigured checkpoint. This should be determined by the electrical engineer during the design phase, and brought to the attention of TSA Headquarters (HQ) immediately.

The electrical design of a new or reconfigured checkpoint must meet all applicable national and local codes in addition to any airport, state, county, and/or city requirements, depending on the Authority Having Jurisdiction (AHJ). Uninterruptible Power Supply (generator) backup power is not required for SSCPs, except at some sites where power conditions are unstable and/or unreliable. In the IT room, it is advised to have the TSA and ASL servers on generator power.

Power Requirements Table	Device/space, circuit type, voltage, receptacle type, comments	Power Requirements Table.docx
SSCP Power Connectivity Diagram	Illustration of equipment that must be connected to SSCP power panel board	SSCP Power Connectivity Diagram.

7-2 Power/Data Receptacles

The five types of TSA-approved electrical distributions and/or devices are to be used for powering SSCPs unless the Airport Authority states otherwise. Power should never be placed underneath the main body of the equipment.

1. Modular surface-mounted pedestals in the floor and wall
   - Recommended at checkpoints where a small floor penetration is desired

2. Recessed power/data poke-through devices in the floor
   - Recommended where a large core drill will not impact the structural integrity of the floor
   - Recommended where flush installation is desired
   - Required for under Travel Document Checker (TDC)/Credential Authentication Technology (CAT) and free-standing Supervisory Transportation Security Officer (STSO) podiums

3. Flush power/data poke-through devices in the floor and wall
   - Recommended only for equipment that does not require a twist-lock or simplex receptacle
   - Recommended in low-traffic areas, since these receptacles have nonmetallic covers that are not robust

4. Multiplex surface boxes
   - Recommended for slab-on-grade checkpoints

5. Ceiling- or floor-supported power/data poles
   - Ceiling-supported power poles recommended for slab-on-grade checkpoints where floor trenching is not desired
   - Floor-supported power poles recommended for Advanced Imaging Technology (AIT) when there is passenger flow on both sides of the AIT

Power should never be placed underneath the main body of the screening equipment.

If the design is spaced larger than the standard not staggered layout, outlet locations will need to be reviewed/added and or adjusted due to cord lengths of the equipment.

The airport architectural and engineering (A&E) firm should coordinate closely with the airport and TSA HQ when designing electrical systems to ensure the needs of both parties are met.

TSA recommends that modular surface-mounted pedestals be located beneath x-ray conveyors. This type of receptacle is highly versatile and requires a smaller floor penetration. When a modular surface-mounted pedestal is not ideal, the Wiremold Evolution Series Model 6AT/8AT recessed poke-through can hold numerous receptacles, data jacks, grommet openings, and connectors within one device. This receptacle can be installed flush with the floor for high-traffic areas and locations with moving equipment. This receptacle requires a 6" core drill, which may be a drawback if the structural integrity of the floor is of concern. The location of the poke-throughs, with respect to the structural framing, quantity of poke-throughs, and proximity to other poke-throughs, must be carefully evaluated by the checkpoint electrical and structural engineer(s).

Although the poke-through is identified as being “recessed,” the cover actually sits slightly above the floor. This is acceptable at most locations within the checkpoint, with the exception of the TDC/CAT, STSO podium, and future Biometric Authentication Technology (BAT). These two locations should have truly recessed poke-throughs, because the equipment at these locations is not static. Recessed poke-throughs maintain the flexibility to adjust the equipment in the future without creating trip hazards for passengers and personnel. This truly recessed poke-through can be achieved by specifying a structural detail on the construction drawings to core drill a hole approximately 1/4" larger than the recessed poke-through cover so that the lip of the cover sits down in the floor. This installation is required when power/data is provided from the floor.

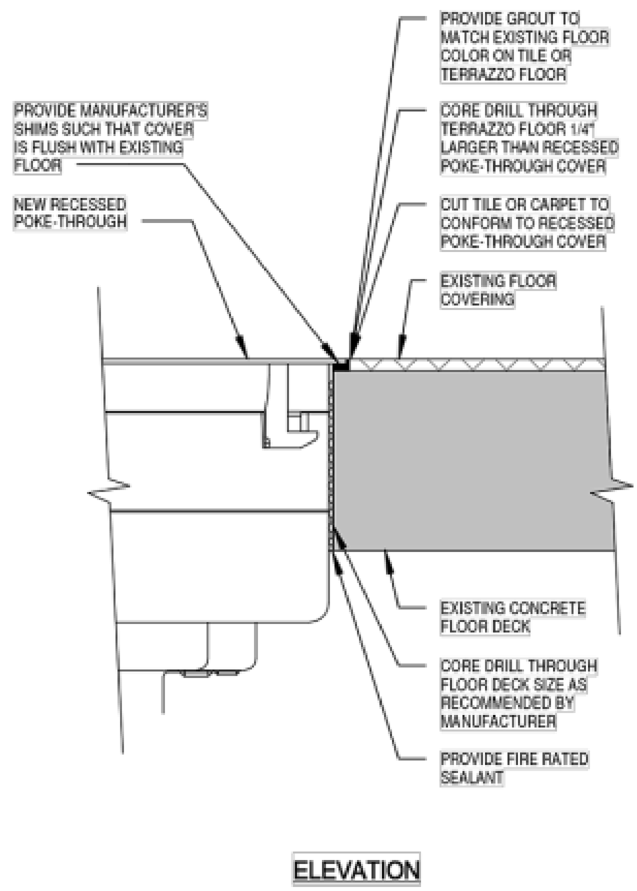
Power poles can be used when a checkpoint is slab-on-grade, or when power poles are the preferred method of power and data distribution at the checkpoint.

Structural slab-on-grade, terrazzo floors, or high ceilings with an open plan pose a challenge for connecting power and data to checkpoint equipment. Viable alternatives are freestanding, self-supporting, movable overhead truss systems and modular raised access flooring. Additional modifications may be required to accommodate equipment. While these options may be expensive initially, they offer the flexibility to reconfigure checkpoints or deploy more equipment without incurring significant infrastructure costs.

Power and data receptacles should be properly mounted, fire-proofed, and of high quality industrial standard to accommodate high-volume traffic at the SSCP.

All power/data recessed or flush poke-through devices, modular or made-up surface boxes, power poles, fittings, raised access flooring,

Recessed Poke-Through Installation Detail



self-supporting truss systems, and in-floor walkerduct systems must be coordinated with the Airport Authority. For consistency, the type, finish, and color of electrical devices typically used throughout the terminal should also be used at the checkpoint. Convenience outlets may be housed in a different color cover to differentiate convenience and security power. Exceptions may be allowed to minimize the addition of new core drills or to maintain flexibility for relocating the SSCP. The Checkpoint Electrical Engineer should confirm with the Airport Authority if the electrical distribution should match the existing checkpoint or if it should be changed to match the terminal or support future needs. The airport and/or the AHJ may also want to evaluate floor core sizes and quantities as well as the locations of any new electrical trenches. Airports with terrazzo floors are especially concerned about excessive floor penetrations and the risk of poorly executed patching. The airport may prefer modular or made-up surface boxes that require only 1" to 3" cores in lieu of recessed poke-through devices that require 6" to 8" cores. Although surface boxes require a smaller core, more boxes would be required to support all the planned Transportation Security Equipment (TSE), resulting in more floor coring; a comparison is presented in the following section. The electrical approach should be discussed with the AHJ as early in the project as possible to avoid delays with the permit. Every attempt to reuse existing floor cores should be made when reconfiguring an existing checkpoint.

Acceptable locations for receptacles are included on the plan views for the equipment. Recessed, flush, or surface devices should be positioned to avoid creating trip hazards for both passengers and TSA personnel. Under special circumstances only, an existing floor core located beneath an X-ray dome can be reused by installing a junction box on top of the core and extending it with rigid or flexible conduit to a surface box located under the infeed or outfeed.

Receptacles should be located within reach of the equipment cords. The equipment cord lengths are included. Extension cords for permanently installed equipment are unacceptable. Equipment cords must be secured to the floor with pancake raceway, cord clips, etc. Equipment cords are not to be placed across passenger walkways or TSA working paths, or run underneath anti-fatigue mats or AIT units, where they may pose a trip hazard, be damaged from traffic, or create an NEC violation.

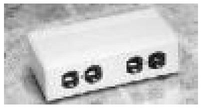
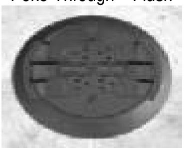
Electrical receptacles must be protected from damage or inadvertent contact by equipment, passengers, and/or TSA personnel. Unused ports should be covered.

To comply with 2017 NEC 210.7, duplex outlets that are split-wired with separate circuits to each receptacle must be fed from a two-pole circuit breaker or two side-by-side single-pole circuit breakers that have an approved link between the circuit breaker operator handles. The 2017 NEC 210.7 requirement states, “where two or more branch circuits supply devices or equipment on the same yoke, a means to simultaneously disconnect the ungrounded supply conductors shall be provided at the point at which the branch circuits originate.”

When existing poke-throughs or surface boxes are no longer needed at an SSCP, the checkpoint designer should direct the contractor to perform the following tasks.

- Remove the power/data outlets and devices.
- Pull and remove the existing wiring back to its source.
- Repair the floor core opening to restore the floor slab to its original integrity.
- Install a flush cover plate, as required, for the type of outlet device removed.

Power/Data Device Distribution

Item	Service Type	Description	Pro	Con	Recommendation
1	Modular Surface Box 	Pedestal poke-through with a 2-compartment box • 9.25" W x 4.63" D x 2.63" H; 2–3" holes/box, dependent on manufacturer	• 2–3" hole in floor, depending on manufacturer • Underwriters Laboratories (UL)-listed assembly • Fire-rated • Cover plate can be added if location is abandoned • Supports any outlet configuration • Can be plugged in beneath X-ray	• Not flush—trip hazard • Floor X-ray required to avoid existing steel • Plug above floor level; can be knocked out	• Recommended at checkpoints where small floor penetration is desired • Recommended for use under X-ray
2	Poke-Through – Recessed 	Poke-through with recessed receptacles • 7.25" diameter; 6" hole/device	• Completely flush installation—minimizes trip hazards. • Easy/quick installation • UL-listed assembly • Fire-rated • Tamper-proof cover • Recessed connections • 6" device can support any 20A outlet configuration	• 6" hole in floor • Floor X-ray required to avoid existing steel • Extra coring required to mount lip of receptacle flush in terrazzo floor	• Recommended at checkpoints where large core drill will not impact structural integrity of floor • Recommended at checkpoints where flush installation is desired • 6" device has smaller surface presentation than modular or made-up surface boxes
3	Poke-Through – Flush 	Poke-through with flush receptacles • 7.5" diameter x 5/16" H; 3–4" hole/device, dependent on manufacturer	• Easy/quick installation • UL-listed assembly • Fire-rated • Wide variety of device combinations	• Floor X-ray required to avoid existing steel • Not flush—raised lip is a trip hazard • Electrical devices are proprietary • Plug above floor level; can be knocked out • Floor cover is plastic in some cases; less durable in high traffic areas	• Recommended only for equipment that does not require twist-lock or simplex receptacle • Recommended in low-traffic areas, since nonmetallic covers are not robust
4	Multiplex Surface Box 	Surface-mount cast box • 8-3/4" W x 6-3/4" D x 3" H, (2) 1-5/8" holes/outlets	• 7/8" hole in floor • 1/2" Rigid Galvanized Steel (RGS) floor penetration • Inexpensive • Easy to relocate and repair floor • Easy reconfiguration • Limited structural impact to floor • Supports any outlet configuration	• Not flush—trip hazard • Floor X-ray required to avoid existing steel • Not attractive • Plug is above floor level; can be knocked out	• Recommended for slab-on-grade checkpoints
5	Ceiling- or Floor-Supported Power Pole 	Floor-to-ceiling dual channel metallic raceway • 36" above finished floor (AFF) floor-supported • Wiremold Vista Point 5 • Column	• Inexpensive • Easy to relocate and repair floor/ceiling • Easy reconfiguration • Supports any outlet configuration	• Not attractive • Obscures visibility across checkpoint • Safety concern for high-traffic areas • Difficult to install at checkpoints with high ceilings	• Ceiling-supported power poles recommended for slab-on-grade checkpoints where floor trenching is not desired • Floor-supported power poles recommended for AIT when there is passenger flow on both sides of AIT

7-3 Power/Data Configurations

Checkpoint equipment can be fed by a power/data device configured to support one or several pieces of equipment. As the device gets larger, more equipment can be supported. The larger the device, the bigger the floor core required, which often becomes a roadblock with the airport and/or the permitting authority. The checkpoint architect should indicate the configuration of the electrical distributions/device on the drawings to inform the contractor of the combination of receptacles, data jacks, and connectors needed to support equipment that is located together.

An example of the impacts of using different devices is illustrated in the **Device Comparison** file. One may deduce from the details that additional devices may be needed to achieve the same configuration. The airport or AHJ may be convinced to use the larger poke-through(s) to support the most equipment and reduce the number of holes in the floor. However, they may request a structural analysis to evaluate any impacts before final approval is granted.

Device Comparison	Examples of the impacts of using different devices	Device Comparison.docx
Standard Floor Outlet Configurations	Standard floor outlet configurations for X-ray AVS/ ETD/BLS, TDC/CAT and STSO, PSR, etc.	Standard Floor Outlet Configurations.docx
Standard Electrical Infrastructure Layout – Power and Data Stanchion	Picture and plan view of power and data stanchion	Standard Electrical Infrastructure Layout
Standard Electrical Infrastructure Layout – Surface-Mounted Conduit and Devices	Illustrations of surface-mounted conduit and devices	Standard Electrical Infrastructure Layout -

7-4 Power/Data Plans

The **Electrical and Data Planning** shows the recommended power/data layout. The graphics depict the approximate locations and various devices that can be used to support multiple TSE. Recessed, flush, and surface devices are represented by the hexagon. Most of these devices are concealed under equipment with enough clearance for the height of the device and plug. The truly flush recessed device, represented by the clover symbol, is shown at the required two locations. Power poles are represented by a square or oval. Only one type of distribution should be chosen per location. Power poles should only be included when the checkpoint is slab-on-grade or the preferred distribution is via power pole. Every attempt should be made to locate receptacles under the lanes (and not under the main body of the Advanced Technology [AT], Computed Tomography [CT], or AIT) to feed the lanes and all infield equipment; however, this is not always possible. Power/data circuits should be grouped within the same device, as applicable, to limit the number of floor corings required.

Recessed, flush, and/or surface device placement should support future arrangements.

7-5 Electrical and Data Requirements for Certified TSE

Electrical and data planning information by technology and manufacturer can be found in the documents below.

Electrical and Data Planning – AT and CT	Electrical Layouts and Devices, Data Layouts, Cable Requirements, Device Options and Conductors	Electrical Diagram_R0_AT-CT_	Electrical Diagram_R0_AT-CT_
Electrical and Data Planning – ASL	Electrical Layouts and Devices, Data Layouts, Cable Requirements, Device Options and Conductors	Electrical Diagram_R0_ASL_20	Electrical Diagram_R0_ASL_20
Electrical and Data Planning – CT and ASL	Electrical Layouts and Devices, Data Layouts, Cable Requirements, Device Options and Conductors	TBD	TBD

7-6 Data Requirements

TSA Information Technology (IT) and the Security Technology Integrated Program (STIP) require most powered security screening equipment to have two data drops—one redundant—consisting of flush-mounted 568B, Cat5e/Cat6 RJ-45 data jacks with the associated TSA-approved labeling methodology. Both drops should be connected using Cat5e/Cat6 data cable. Cables should be tested for connectivity, labeled, and run to the patch panel or switch in the TSA IT cabinet closest to the checkpoint. TSA IT will make the terminations in the cabinet. The TSA IT cabinet should be in a secured room. The data cable type should be based on existing conditions at the checkpoint.

As checkpoints are reconfigured, either the project sponsor’s contractor and the TSA IT department group participate in relocating and providing new data outlets and cables needed to support new technology.

In either scenario, a working group—consisting of representatives from the Airport Authority, Federal Security Director (FSD) staff, local TSA, TSA HQ Designer, and TSA HQ IT Department—must be formed. The group should meet as soon as is practical via conference call to ensure that all aspects of the checkpoint redesign are identified and assigned to a specific group for action and funding. This team will organize the working group members, and will develop, review, and approve the SOW. The TSA IT Field Regional Manager (FRM) should always be consulted when a checkpoint redesign is initiated.

At a minimum, the following guidelines should be considered when designing a new checkpoint or reconfiguring an existing checkpoint.

- If an existing TSA Main Distribution Frame (MDF)/Intermediate Distribution Frame (IDF) is within 295' of the SSCP:
  - Verify that the existing switches have sufficient open ports to accommodate the required number of data drops.
  - Install an additional switch if the existing switch capacity will not accommodate the required number of data drops.
  - Punch down cabling from the individual SSCP devices in the patch panel of the IT cabinet in a 568B wiring configuration.
  - Initiate IMAC group to install jumper cables from the patch panel to the switch, and activate the port. This process is described later in this section.

- If there is no MDF/IDF within 295' of the SSCP:
  - Install an appropriate IT cabinet (IT cabinet specifications are embedded below)
  - Install single-mode fiber optic cable from the IT cabinet to an existing TSA MDF/IDF.
  - Punch down cabling from the individual SSCP devices in the patch panel of the IT cabinet in a 568B wiring configuration.
  - Initiate IMAC group to install jumper cables from the patch panel to the switch, and activate the port.

The IMAC process is the course of action required by TSA IT to implement an IT request at a checkpoint. The project sponsor is responsible for making TSA IT aware of the airports and checkpoints receiving new equipment that requires new or relocated data outlets and cabling. Once this initial contact has been made, a process is identified for each group to execute.

The IMAC process needs to be initiated for the following activities. Each activity below takes 90 to 120 days to implement unless otherwise noted.

- Installation of a new IT cabinet
- Relocation of an existing IT cabinet
- Installation of additional IT equipment
- Relocation or installation of fiber
- Relocation or installation of T1 and/or Out of Band (OOB)
- Management of analog lines for monitoring modems in the IT cabinets (takes approximately 45 to 60 days to implement).

The preceding durations are determined from the date the SOW was submitted by the TSA IT FRM and approved by the IMAC team. Because it can take several months to implement IT modifications, it is imperative to engage each team member as early as possible to avoid gaps in IT services.

The specifications for the Kronos 4500 Time Clock Terminal are included in the following table. This clock should be located within 295' of the TSA MDF/IDF and should use Power Over

Ethernet (POE). These terminals need to be deployed at TSA airports and offsite locations to support the Electronic Time, Attendance, and Scheduling (eTAS) Program, which monitors and tracks timekeeping for Transportation Security Officers (TSOs) across the country. The *TSA Kronos Terminal Installation and Configuration Guide*, Version 1.7, dated October 29, 2009, provides additional information.

Installation and/or relocation of Cat5e/Cat6 data cabling and installation and operation of IT cabinets should meet or exceed the specifications in **TSA Structured Cabling System Guidelines**, linked in the Structured Cabling Requirements section. The **SSCP Data Connectivity Diagram** illustrates the equipment that must be connected to the IDF IT cabinet, and equipment that must be connected to other equipment, such as the AT to the AVS.

Kronos Time Clock Spec Sheet	Power and IT requirements, dimensions, etc.	Spec Sheet_Kronos Clock.docx
IT Cabinet Spec Sheet	Power and IT requirements, weight, elevation, and standard layout	Spec Sheet_IT Cabinet.docx
SSCP Data Connectivity Diagram	Illustration of equipment to be connected to IDF IT cabinet vs. other equipment	SSCP Data Connectivity Diagram.

Structured Cabling Requirements

The **TSA Structured Cabling Guidelines** provide direction for a telecommunications wiring system in TSA spaces or buildings to support TSA's mission and operations. Its purpose is to enable planning and installation of building wiring with minimal advance knowledge of the telecommunications products to be used.

Building wiring represents a significant investment. Varied wiring plans and media exist in buildings today, resulting in increased labor costs for move, add, and change (MAC) activities. Selective rewiring also occurs in some locations where existing media do not provide sufficient bandwidth transport capabilities.

These guidelines apply to future installations and renovations of buildings and work areas.

TSA Structured Cabling Guidelines	Defines guidelines for structured telecommunications wiring within TSA facilities or buildings; includes all components from work area connections to local inter-building facilities.	TSA Structured Cabling Guidelines.do

Duress Alarm Requirements

Duress alarms must be installed at TSA SSCPs to provide a silent alarm system (no audible or visible alerts at the location where the button is activated). The system notifies the monitoring authority of eminent danger to human life when a button mounted on a predetermined TSE location is depressed. The duress alarm system includes a wireless duress button, repeaters (if required), auto-dialer (if required), and a monitoring panel. In instances where wireless technology cannot be utilized, wired duress alarm systems shall be installed.

Duress alarm button should be installed at the following locations:

- TDC/CAT podiums
- Known Crewmember® (KCM) lanes (not co-located with TSA-monitored exit lanes)
- X-ray operator positions
- Supervisor (STSO) podiums
- Permanent Private Screening Rooms (PSRs)
- Explosive detection system areas in the terminal lobby (checked baggage).

The checkpoint designer or checkpoint contractor should adhere to the following guidelines when installing and locating duress alarms:

- When wireless technology cannot be utilized, install wired connectivity.
- Ensure duress alarm signals do not interfere with airport operations
- Install a duress alarm button at each location as described previously, regardless of proximity to other alarms; any deviation must be approved by TSA HQ.
- Ensure system has the ability to identify alarm activation by checkpoint name and location
- Ensure the alarm system provides maximum battery life capability (minimum of 1 year); system shall have a low battery indicator for any components utilizing a battery
- Install the alarm to be easily accessible yet inconspicuous, and to avoid accidental activation; alarm should not cover a panel or any other part of the TSE that provides maintenance access; system should have the ability to be tested at least once a week and to be reset quickly either at the button or monitoring system.

Duress alarm system components/requirements are listed in the following table:

System Component	Requirement/Use
Existing TSA-Installed Duress Alarm System	• All new components must be compatible with/integrate into existing system
Fixed Duress Button	• Battery operated—no infrastructure required (mounted with industrial Velcro)
Wireless Repeater (if required)	• Outlet (within 30') and flat surface for mounting • 24-hour backup battery in case of power loss
Wireless Receiver (Monitoring Panel)	• Outlet and flat surface for mounting • 24-hour backup battery in case of power loss
Auto-Dialer (if required)	• Outlet and flat surface for mounting • 24-hour backup battery in case of power loss • Access to analog (non–Voice over Internet Protocol [VoIP]) phone line(s) (POTS) • Approved for use in Category II, III, and IV airports; use in Category X and Category I airports must be approved by Security Operations HQ

Category X and Category I airports may opt to install a solution that is integrated with an existing security system or opt to be integrated to utilize an existing network at the airport. These duress alarm systems still include the components listed above, but may also include:

System Component	Function
Input Control Module (ICM)	• Use with existing access control system • Provides system acknowledgement of monitored wireless duress alarms through normally open, normally closed, and supervised circuits
Area Control Gateway (ACG)	• Provides integration of wireless duress alarms through existing Ethernet network connection
System Control Processor (SCP)	• Communicates with ACG • Processes wireless duress alarms for display in access control software product
Access Control Software	• Manages wireless duress alarms

The Deployment and Logistics Division can provide system and component details for TSA duress alarms. If an airport opts to install a different system, installation must be coordinated through the airport's FSD, and Security Operations approval is required in advance.

Duress Alarm Design Guide	Reference for design and implementation of TSA Duress Alarm System	Duress Alarm Design Guide Reference v1.p|

8 Supplemental Information

This section provides supplemental information for consideration.

Revision	Date	Description of Changes
0	12/17/2018	Initial Publication

8-1 Emergency Checkpoints

Unforeseeable circumstances and/or acts of nature may arise in which existing checkpoints cannot be utilized or additional/temporary checkpoints are required. The following list provides layout examples for consideration during these situations.

10x30 Temporary Checkpoint Screening Layout	10x30 Temp Chkpt Screening Layout.pdf
20x40 Temporary Checkpoint Screening	20x40 Temp Chkpt Screening Layout.pdf
Rapiscan Dual Lane Temporary Emergency Checkpoint	Rapiscan Dual Lane Temp Emer Ckpt.pdf
Rapiscan Single Lane Temporary Emergency Checkpoint	Rapiscan Single Lane Temp Emer Ckpt.pdf
Smiths Dual Lane Temporary Emergency Checkpoint	Smith Dual Lane Temp Emer Ckpt.pdf
Smiths Single Lane Temporary Emergency Checkpoint	Smith Single Lane Temp Emer Ckpt.pdf
Temporary Emergency Checkpoint CAD File	Temp Emer Ckpt.dwg

8-2 Closed-Circuit Television (CCTV) Requirements

Cameras are not mandatory at Security Screening Checkpoints (SSCPs), but they increase the level of security by deterring theft, reducing claims, providing data for resolving issues, and capturing visual records of suspicious activity. Cameras are particularly helpful at unmanned or closed checkpoints and Known Crewmember® (KCM) locations. The number of cameras to use varies depending on the checkpoint size, obstructions within the checkpoint, lighting, and the quality of the CCTV system. A sufficient number of cameras should be added to cover each lane, all secondary screening areas, and co-located exit lanes. Camera coverage details will be determined by local TSA and the project sponsor with the airport or local police. Passenger privacy should be protected by ensuring the cameras do not captures views into Private Screening Rooms (PSRs). Cameras should be positioned to show the front view of a person's face and any other identifying characteristics.

Additional lighting may be required for a CCTV system at the checkpoint. This lighting should be provided by the group that funds and maintains the CCTV system.

Where possible, the CCTV should be designed as an extension of the airport's existing security system. When CCTV is part of an extended system, the equipment should match the existing hardware to minimize maintenance costs and provide operator familiarity. Storage and retrieval of video footage is determined on a site-by-site basis. The existing security system should provide a minimum of 30 days of recording. The local TSA and law enforcement should be able to access the system at or near the checkpoint. The security system should have a means to maintain an accurate system time. When a CCTV system exists, it is shared between the airport, law enforcement, and local TSA. Sometimes construction documents by the CCTV owner's designer or other designated firm are required to indicate the CCTV system scope of work for relocating or adding cameras to support the checkpoint reconfiguration or additional new equipment. These drawings are typically full-sized, and consist of the following:

- CCTV and electrical system abbreviations, symbols, and general notes
- CCTV camera mounting details
- CCTV system demolition, indicating components to remain or be removed. Includes a CCTV camera schedule indicating focus, aim, mounting, and applicable remarks for each existing CCTV camera.
- New CCTV system installation, indicating components to remain or to be provided as new. Includes CCTV camera schedule indicating focus, aim, mounting, relocation, disposition, and type for each remaining/new CCTV camera.

These drawings are not typically provided by TSA, but they are part of a checkpoint construction contract. TSA provides the operational requirements from the local Federal Security Director (FSD), along with enough detail for the system to meet the needs of the program. A typical operational requirement is to "provide a view of people entering and exiting a walk-through metal detector (WTMD) with enough detail to recognize the person and any object they may be carrying." Specific questions on the generation of requirements should be directed to the Advanced Surveillance Program (ASP) at ost_asp_video_surveillance@tsa.dhs.gov.

8-3 Safety Requirements

SSCPs must screen passengers and their carry-on baggage without compromising the safety of the passengers or the Transportation Security Officers (TSOs) conducting the screening. Safety requirements and safety-related considerations must be built into the SSCP design from the beginning and should be treated as integral to the design process. The standard checkpoint layouts in this guide are intended to provide starting points, but safety Subject Matter Experts (SMEs) should be included in every design phase to provide input on concept plans and/or construction drawing packages.

All checkpoints must maintain a minimum of two paths of egress for exiting the checkpoint at all times. This is achieved by providing egress from the checkpoint via the exit to the airport terminal, and egress between the Advanced Technology (AT) X-ray and wall or between two operator sides of the AT X-Ray. All egress paths through the non-sterile side of the checkpoint shall be secured by an access gate, as described in this guide.

Particular safety issues related to equipment or layouts that are likely to arise in the course of SSCP design are discussed within the appropriate sections of this guide; however, this guide is not intended to provide an exhaustive list of such issues. Safety experts from each discipline should review all available sources of information, such as national and local building codes, fire codes, best practices, Technical Notes, Job Aids, Occupational Safety and Health Administration (OSHA)/Occupational Safety, Health, and Environment (OSHE) requirements, and TSO injury data to ensure that each SSCP design incorporates the most current knowledge.

The SSCP equipment, including PSRs, must meet all local code requirements and/or ASHRAE standards for heating, ventilation, and air conditioning (HVAC). When checkpoints are located outside, the Authority Having Jurisdiction (AHJ) should be consulted.

Indoor air temperature and relative humidity should be maintained at comfortable levels based on occupancy, size, and exposure of the SSCP. Air quality should be monitored at the checkpoint to prevent build-up of carbon dioxide from human respiration and to minimize odors.

The SSCP must meet all local building, mechanical, and OSHE code requirements. New construction or renovated areas with complete HVAC system replacement should achieve minimum ventilation rates and other measures intended to provide acceptable air quality and minimize adverse health effects, as specified in ASHRAE 62.1, Ventilation for Acceptable Indoor Air Quality. The SSCP baseline hazard analysis will evaluate air quality and environmental conditions to identify potential deficiencies.

9 Structural Considerations

This section summarizes structural considerations not addressed elsewhere in this guide.

Revision	Date	Description of Changes
0	12/17/2018	Initial Publication

9-1 Structural Overview

General Requirements

The project shall be designed and constructed to support all approved TSA-designated equipment and the building's dead/live loads, and shall be built in accordance with the local building codes and other recognized national standards. The following are items are to be considered when designing the support floor:

- Raised/access floors are permitted, but must meet all design requirements.
- A concrete pad should be emplaced under the Walk-Through Metal Detector (WTMD) when a raised/access floor is used. The recommended size of the concrete pad is 10'x10' with 5" depth.
- Vibrations from floors or equipment below the checkpoint and around equipment should be minimized. Contact the original equipment manufacturers (OEMs) for further information.
- Conduit, reinforcement, etc., may cause electrical interference on TSA equipment and should be minimized or eliminated.
- Avoid placement of the WTMD on expansion joints or walkerduct plates
- Avoid placement of other TSE legs on expansion joints or walkerduct plates

Floor protection is to be provided when moving or relocating equipment.

9-2 Weights, Dimensions, and Floor Loads

The following table lists sizes, weights, and loads for passenger and carry-on bag screening Transportation Security Equipment (TSE).

Dimensions, Weights, and Loads

System [a]	Main Body Dimensions [b]			Bump-out Dimensions [c]		Footprint	Weight	Added Load	Floor Load
	L (in.)	W (in.)	H (in.)	L (in.)	W (in.)	(ft^2)	(lb)	(lb)	lb/ft^2
L3 ProVision® ATD [d]	104.38	76.68	104.92	N/A	N/A	55.6 [d]	1,800	200 [d]	TBD [f]
L3 ProVision® 2 [d]	59.13	42	93	N/A	N/A	15.1 [d]	1,500	200 [d]	99.3 [f]
Rapiscan 620DV	59.21	35.83	114	20.47	27.87	14.7	2,458	365 [e]	84
Smiths 6040aTix	96.7	37.4	162	36.0	15.0	25.1	3,528	352 [e]	86
Smiths CTiX	65.35	129.92	67.87	N/A	N/A	59.0	5,225	352 [e]	87
L3 ClearScan	94.8	58.4	59.0	N/A	N/A	38.4	4,600	220 [e]	87
IDSS Detect 1000	59.9	146.2	63.0	N/A	N/A	60.8	3,300	TBD [f]	82
Analogic ConneCT	56.69	102.27	69.08	N/A	N/A	40.3	4,370	300 [e]	87
Rohde & Schwarz QPS201	56.46	68.9	91.3	N/A	N/A	27.0	871	200 [d]	TBD [f]
MacDonald Humfrey Mach-SmartLane	834.25	54.38	Varies	N/A	N/A	315.0	TBD [f]	TBD [f]	TBD [f]
Vanderlande SCANNOJET	877.88	85.75	Varies	N/A	N/A	522.8	TBD [f]	TBD [f]	TBD [f]
Scarabee	945.88	101.25	Varies	TBD [f]	TBD [f]	665.1	TBD [f]	TBD [f]	TBD [f]

[a] Structural support shall include support during transportation at the final installation at the checkpoint.
[b] Main Body Dimensions are the dimensions of the equipment that contribute to distributing the weight of the machine to the floor.
[c] AT X-ray Bump-out Dimensions included only if the bump-out extends all the way to the floor and contributes to distributing the weight of the machine to the floor.
[d] Main Body Dimensions/Footprint area estimated to be circular based on the width of the AIT and manufacturer literature. Does not include the passenger entrance/exit ramp. Added Load assumes a 200 lb person inside the AIT.
[e] Added Load is the maximum baggage weight that can be placed on the conveyor.
[f] TBD indicates information is forthcoming/under review, if applicable.

9-3 Seismic Anchoring, Fire Codes, and Other Local Codes

Check local codes for requirements and compliance, including fire and seismic. TSA does not require seismic bracing/anchoring, but it may be required by local codes. In these cases, a seismic analysis may be required to secure equipment properly.

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