Passenger Screening

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Transportation Security Administration
Innovating the Future of Aviation Security

**Alignment to Strategic Five-Year Technology Investment Plan Themes:**

1. Enhancing Core Mission Delivery by Focusing on System of Systems
2. Integrating Principles of Risk-Based Security (RBS) in Capabilities, Processes, and Technologies
3. Streamlining Acquisitions, Requirements, and Test and Evaluation Processes
4. Increasing Transparency in Engagement with Stakeholders to Enable Innovation
Agenda

- Checkpoint Solutions and Integration Division (CSID) Overview
- Current Legacy Systems and Future Capabilities
- TSE Procurement Quantities for FY17-26
- CSID Highest Priorities
- Checkpoint TSE Capabilities
- Opportunity - Biometrics
- Future of Passenger Screening
- Industry Challenge
- Questions
The Passenger Screening Program (PSP) focuses on identifying, field testing, procuring, deploying, and sustaining equipment that detects explosives and/or prohibited items that may be concealed on passengers and/or their carry-on items.

Security Technology Integrated Program (STIP) provides a dynamic, adaptable communications infrastructure that facilitates the transfer of information to and from TSE to meet the emerging data collection/management, equipment tracking/maintenance, and data analytics capabilities required by TSA.

**CHALLENGES**

- Responding to constantly evolving threats
- Maintaining affordability
- Ensuring compliance with acquisition guidelines and policy
- Addressing cybersecurity requirements
- Incentivizing best system performance
- Mitigating inconsistent within-fleet deployed TSE performance
- Accessing vendor software
- Leveraging biometrics
- Transitioning from innovation to acquisition
- Maintaining current Legacy Systems while investing toward future capabilities
**Current Legacy** resources and efforts yield to **Future Capability** investments and development

**Current Legacy Systems**
- CAT
- AT
- Wide-Band AIT Tier III
- BLS
- AIT Tier II
- L3 AT

**Future Capabilities (System of Systems)**
- Automation of image analysis (deep learning algorithms)
- Reduced false alarm rate
- Minimized divestiture (laptops and liquids in bags)
- New detection standards
- Added HME-detection capability
- Interchangeable Checked Bag/Checkpoint common platform X-Ray
- Adaptive screening capability Risk-Based Security (RBS)

**MITRE System Architecture Work**
- Maintain agility by constantly modifying developing capabilities based on the evolving threat environment

**Resource Challenge:**
- Current Passenger Screening Program (PSP) will transition from procurement to sustainment in 2020
- Future capability costs exceed the PSP funding profile for these legacy systems
- TSA is planning for the establishment of new programs to support checkpoint operations based on an Open Architecture (OA), System of Systems (SoS) approach
TSE Procurement Quantities for FY17-26

Procurement quantities for full TSE requirements (PSP and New Programs) based on the program’s current needs and capabilities

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Additional Federalized Airports = Additional TSE Requirements

Working to Determine…

Timing  Number  Specific Locations
As we approach the upcoming FY, CSID is focusing its efforts on the five high priorities below, which aim to improve detection capabilities and security effectiveness at the checkpoint.

- **Credential Authentication Technology (CAT)** – Working to meet cybersecurity requirements in order to deploy CAT
- **Advanced Imaging Technology (AIT-3)** – Researching opportunities to improve detection capabilities of currently fielded systems
- **Advanced Technology (AT) Tier II** – Working to achieve Tier II capabilities on currently fielded systems
- **Explosive Trace Detector (ETD)** – Working to ensure the deployed fleet of ETDs can meet the current and upcoming detection standards
- **Bottle Liquid Scanner (BLS)** – Looking to increase detection capabilities to include scanning opaque bottles and other liquids

*Industry can support these priorities by becoming involved in the development of the passenger screening technologies and capabilities outlined above*
The networked CAT solution (CAT Phase II) relies on network connection to SecureFlight (SF) via STIP in order to receive passenger flight and vetting information.

**Pre-Checkpoint Operations**

- Passenger Pre-Screening
  - Passenger risk is determined by SF and communicated to CAT through STIP.
  - Passenger provides data to SF
  - SF conducts vetting and returns result to airline
  - Passenger accesses boarding pass

- Benefits
  - Ability to access and vet passengers through SecureFlight at the checkpoint
  - Authentication of IDs
  - RBS approach at the checkpoint
  - Encryption of Personally Identifiable Information data in transit

**Checkpoint Operations**

- Boarding Pass Assessment
  - The passenger’s boarding pass and identification (ID) are compared to ensure that they are directed to the correct screening.
  - CAT validates ID
  - CAT displays passenger vetting status information to the Transportation Security Officer (TSO)
  - TSOs directs passenger to lane

- Physical Screening
  - The passenger undergoes physical screening processes by TSOs.

**Status:**
- Developing solution to address cybersecurity requirements
- Preparing for operational test & evaluation
- Planning to deploy in FY17-18
Capability - AIT

The AIT safely screen passengers for metallic and non-metallic threats.

**AIT-1 Capabilities:**
- Offers a significant increase in detection capabilities for non-metallic threats in addition to metallic threats
- Automated Target Recognition eliminates the need for communication between the Image Operator and Screening Operator, which increases passenger throughput, increases privacy by producing a generic outline with anomalies, and reduces staffing costs
- Meets or exceeds all relevant national and international health and safety standards

**AIT-2 Capabilities:**
- AIT-2 units will have increased detection performance, faster processing times and a smaller footprint
- Current Status: Deployment of AIT-2 units is in process until mid-October

**Near-Term Capabilities (1-3 Years):**
- Wide-Band AIT:
  - Tier 3 & 4 detection capability
  - Improved Inspire threat detection
  - Reduced false alarm rate
- Walk-Through AIT (Open Architecture):
  - Standardized panel form factors, system configurations, hardware and software interfaces, data file formats
  - Application program interfaces for third party software
  - Adaptive screening capability (RBS)

**Mid-Term Capabilities (3-5 Years):**
- Integrated Walk-Through AIT:
  - Positive identification (ID) (Biometrics)
  - Minimal Divestiture (Object Recognition, Shoe Screening)
  - Behavior Detection (Video Analytics)
  - ETD (Optically-Based)

**Status:**
- There are several development and testing efforts focused on advancing AIT detection capabilities that are either currently underway or planned for kickoff:
  - AIT-1 Targeted Threat Algorithm Development Effort
  - AIT-1 and AIT-2 European Union-Approved Software Evaluation
  - AIT-1 Tier III/IV Algorithm Development
  - AIT-1 and AIT-2 Wideband Antenna Development
  - Initiating Primary Passenger Screening T-BAA in FY17
Advanced Technology X-Ray (AT-2) systems are based on penetration X-Ray technology, which presents two-dimensional imagery for threat detection.

**AT-2 Capabilities:**
- Provide TSA with the ability to detect a wide range of threats in carry-on baggage
- Provide a clearer, high-definition X-Ray image compared to single projection systems
- Detect increasingly sophisticated threats in complex concealment scenarios
- Provides the opportunity to reduce the burden on the travelling public by removing restrictions on liquids and electronics in carry-on bags
- Multi-views present X-Ray imaging of carry-on articles from various angles; reduces the potential for masking

<table>
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<th>Near-Term Capabilities (1-3 Years):</th>
<th>Mid-Term Capabilities (3-5 Years):</th>
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<tr>
<td><strong>Enhanced AT-2:</strong></td>
<td><strong>Common Platform X-Ray (Open Architecture) II:</strong></td>
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<td>o Improved vendor algorithms &amp; Concept of Operations (CONOPS)</td>
<td>o Additional measurements in X-Ray tunnel through the use of scatter or phase signatures that improves detection capability and reduces false alarm rates</td>
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<td>o Evaluation of multi-energy detectors</td>
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<td>o Automation of image analysis (deep learning algorithms)</td>
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<tr>
<td><strong>Common Platform X-Ray (Open Architecture):</strong></td>
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<td>o Minimized divestiture (laptops and liquids in bags)</td>
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<td>o Standardized hardware and software interfaces, data file formats</td>
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<tr>
<td>o Application program interfaces for third party software</td>
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**Status:**
- Completed deployment of 550 AT units.
- Contract awarded to Smiths to buy 55 additional AT units
- Completed AT MacDonald Humphrey SmartLane Proof of Concept (PoC) test at TSIF in Q2FY16
- Initiating Primary Carry-on Screening T-BAA

**Qualified Units:**
- **Rapiscan 620DV**
  - US Qualified Products List
  - ECAC Standard 2 Type C Approved
- **Smiths 6040 aTix**
  - US Qualified Products List
  - ECAC Standard 2 Type C Approved
- **L3 ACX 6.4 MV**
  - US Qualified Products List
  - ECAC Standard 2 Type C Approved
Explosives Trace Detection (ETD) technology detects explosive particles on individuals and accessible property intended to be carried into the sterile area or transported onboard and aircrafts.

**ETD Capabilities:**
- Enables TSA to detect explosive particles on individuals and accessible property
- ETD tests can be used at checkpoints, checked baggage, and cargo environments
- TSOs can swab specific items of question for explosive particles

**Near-Term Capabilities (1-3 Years):**
- Multi-track
  - Open windows for Detection Standard 5.0 and 6.2
- Homemade Explosives (HME) detection:
  - Address additional threats, maintain false alarm rate
- High Resolution (Open Architecture):
  - Install broader threat detection capability; reduce false alarm rate
  - Allow third party software

**Mid-Term Capabilities (3-5 Years):**
- Non-contact Sampling:
  - Reduce/eliminate need for manual swabbing through the use of direct analysis methods

**Status:**
- Recapitalizing to bring all deployed systems to Detection Standard 5.0

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**Detected Equipment (Legacy Systems):**
- Smiths Detection
  - Ionscan 400B
  - Ionscan 500DT
- GE Itemiser 2
- Morpho Detection (MD)
  - Itemiser DX
- Implant Sciences
  - QS B2200

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**Deployment Tracking:**

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BLS screening systems are used to detect potential liquid or gel threats which may be contained in a passenger’s property.

**BLS Capabilities:**
- Differentiate liquid explosives from common, benign liquids and are used primarily to screen medically necessary liquids in quantities larger than 3.4 ounces.

**Status:**
- Continue to work with vendors to refine requirements while ensuring the deployed systems continue to capture possible threats
- Plan future BLS testing and activities to be held at Transportation Security Laboratory
- Support potential change in detection standards
- Develop future requirements for the next generation of BLS units

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**Spatial Offset Raman Laser**
- Cobalt Insight 100
  - ECAC Certified Standard 3
  - Class 3 Laser
  - Sampling time 5-8 seconds

**Raman Laser**
- Thermo Scientific Truscreen
  - ECAC Certified Standard 3
  - US Qualified Product List
  - Class 3 Laser
  - Sampling time < 20 seconds

**Wideband Radio Frequency, Infrared**
- CEIA EMA–3
  - ECAC Certified Standard 3
  - US Qualified Product List
  - Sampling time < 5 seconds

**Ultrasound & Dielectric**
- Sellex LS10
  - ECAC Certified Standard 3
  - Sampling time < 5 seconds

**Smiths Detection Responder**
- Spatial Offset Raman Laser
- Cobalt Insight 100
- CEIA EMA–3
- Sellex LS10

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Opportunity - Biometrics

Biometric technologies are crucial tools that TSA can employ to manage risk, increase security effectiveness, and positively impact operational efficiency. CSID is reinstituting a Biometrics Integrated Project Team that strategizes and focuses on TSA biometrics initiatives in alignment with the Department of Homeland Security’s vision for biometrics capabilities.

- **Passenger Identification Support**
  Using the DHS Automated Biometric Identification System to support identification centralizes access to federal and international biometric databases.

- **Conformance to Standards**
  Implementing standardized solutions focused on government and industry open standards will enhance innovation and operability to impact future requirements development.

- **Automated Resource Intensive Identify Processes**
  By automating identify verification, resources at the checkpoint can be freed up to focus on potential threats to the airport and passengers.

- **Throughput Efficiency**
  Expediting security processes using identity verification capabilities will improve passenger throughput, security, and passenger experience.

*CSID has an opportunity to leverage cross-organization efforts and accelerate progress towards a cohesive, long-range strategy that focuses the future use of biometrics by TSA.*
The Future of Passenger Screening

• Pursuit of SoS open architecture
• Acquired as a complete, upgradeable, integrated checkpoint solution meeting current and future broad capability requirements
• Leveraging biometric passenger identification/confirmation/risk-based screening
• Featuring cybersecure STIP connectivity providing operational and maintenance performance monitoring and cuing and software updating capability across the checkpoint enterprise
Industry Challenge

Below are a list of opportunities for Industry to innovate and improve TSA’s capabilities to protect the Nation’s aviation passengers from a range of evolving threats.

• Provide input to T-BAAs
• Develop TSE that fit into an open architecture framework
• Allow greater access to vendor software, including third party access
• Reduce the need for physical contact with passengers
• Reduce divestiture requirements
• Increase TSA’s threat detection capability
• Examine use of biometrics to scan and validate individuals, both for passenger identification and insider threat detection
• Tighten consistency of within-fleet TSE operating performance
Questions?