DHS/TSA Panel

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ALERT ADSA Workshop

May 2-3, 2017

Transportation Security Administration

Innovation Task Force

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May 2-3, 2017

Transportation Security Administration

So What? Who Cares?

ITF Mission: Foster innovation by integrating key stakeholders to identify and demonstrate emerging solutions that increase security effectiveness and efficiency, improve passenger experience and the flow of commerce, and deliver solutions that secure the freedom of movement throughout the nation's transportation systems

Primary Objectives

Collaborate

Convene the aviation security ecosystem to identify and demonstrate solutions

Demonstrate

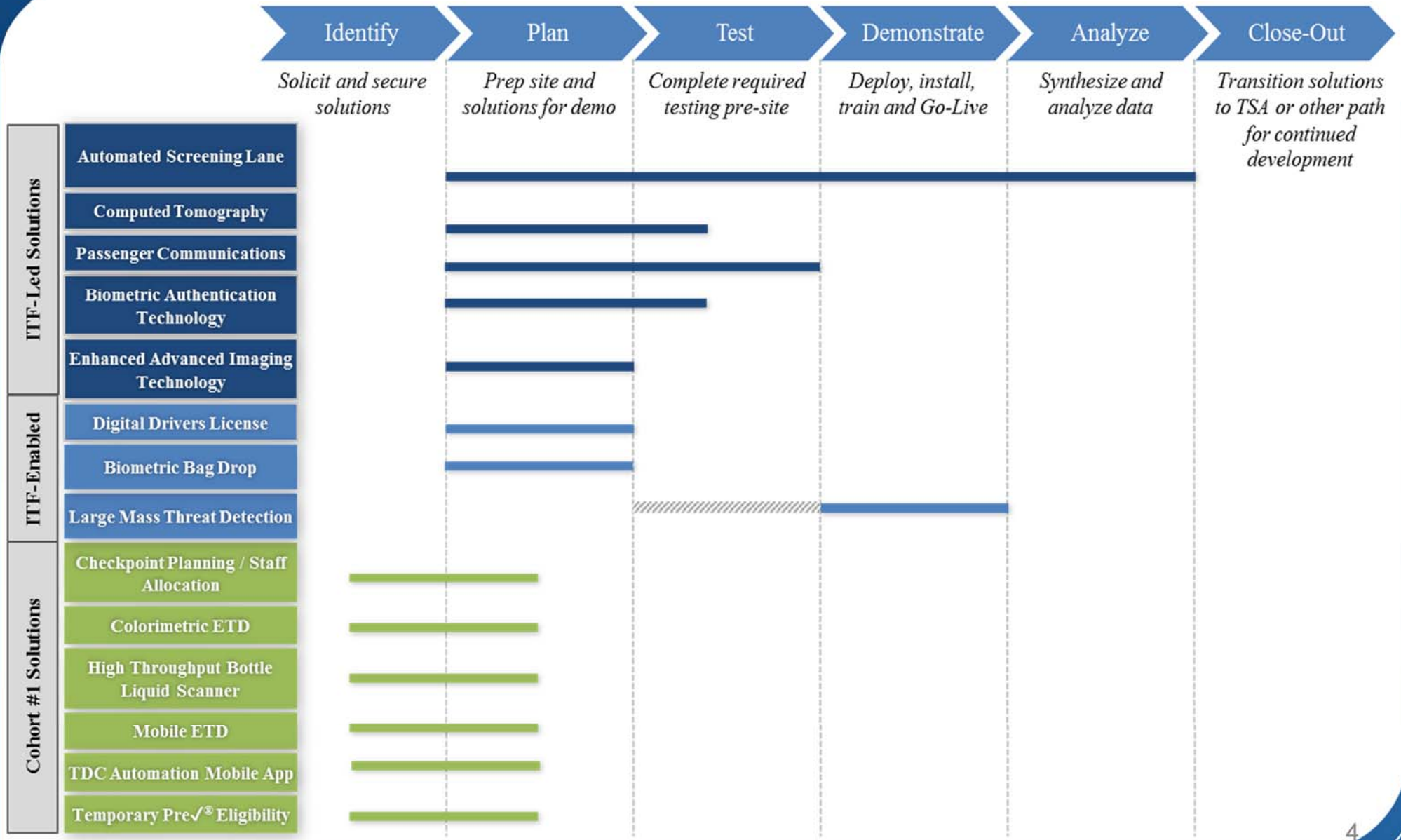
Establish the capability for TSA to quickly demonstrate innovative solutions

Assess

Measure solution effectiveness to achieve the optimized future state and provide vendors with data to improve solutions

TSA success depends on the support of and engagement with multiple stakeholders in the transportation security ecosystem for solution identification and demonstration.

Current ITF Activities



Future Solution Identification

As a continuation of innovative solution solicitation, ITF plans to launch its Innovative Demonstrations for Enterprise Advancement (IDEA) Broad Agency Announcement in Spring 2017.

IDEA Purpose

ITF is working with airports and airlines across the nation to identify innovation sites to demonstrate and assess solutions that address the following goals:

- **Align to TSA Mission**
- **Address Capability Gaps**
- **Enhance Passenger Experience**
- **Improve Screening Efficiency**
- **Improve Security Effectiveness**

Solution Categories

ITF has identified six submission categories for solutions under IDEA. These categories highlight specific areas of interest for TSA and will be used for the purposes of organization and evaluation. Vendors will be asked to submit a solution to a single category.

Solution Selection

Solutions will be reviewed by various TSA stakeholders against the following criteria:

Vendor Capabilities
Vendor's capabilities and related experience

Feasibility
Feasibility of demonstrating the proposed solution in a live airport/operational environment within six months of submission

Funding
Reasonableness of any funding requested and/or feasibility of lifecycle costs required for solution implementation

Mission Alignment
Importance, relevance, and timeliness of technical approach to TSA's mission

Solution Impact
Ability to address capability gaps, improve efficiency, or improve the passenger experience

Transportation Security Capability Analysis Process (TSCAP)

TSA-Wide Capability Gap Process

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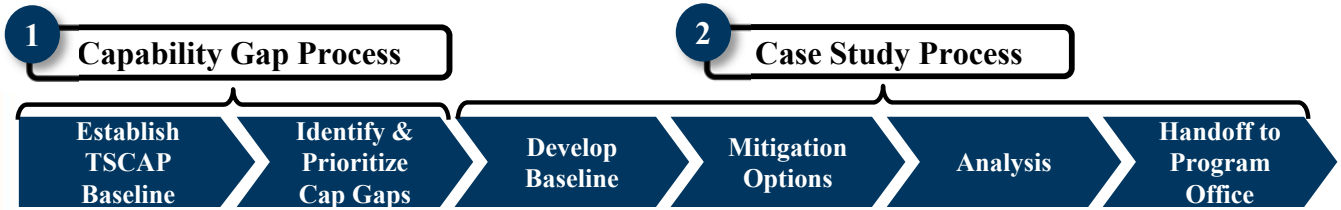
So What, Who Cares?

The Transportation Security Capability Analysis Process (TSCAP) is used by the TSA Office of Requirements and Capabilities Analysis (ORCA) to identify TSA's needs, support better decision making, and recommend security solutions.

Process



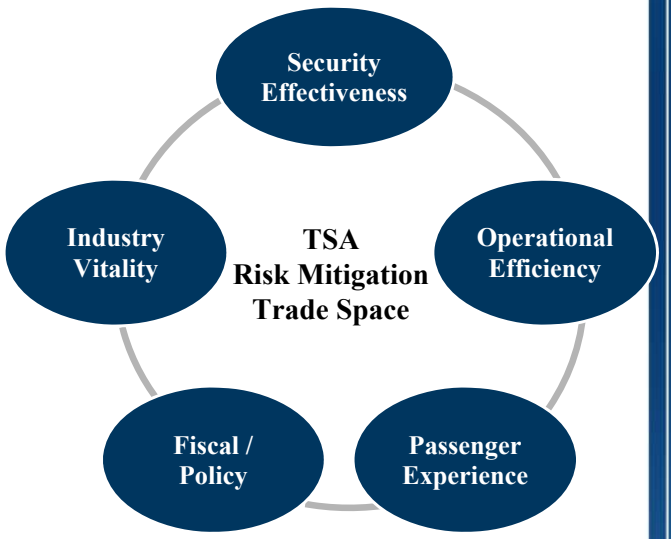
1 Capability Gap Process

Examine measurable performance factors (e.g., throughput rates, system detection) against Department and Agency legislative authorities and strategic plans.

2 Case Study Process

Complete a deep dive analysis into a capability gap(s) and identify alternatives to close the gap. Select appropriate alternatives to pursue R&D investments / new acquisition programs.

Evaluation Criteria



Industry and Academia Applicability

TSCAP allows TSA to document the applicability of new and emerging solutions to different capability gaps to justify investment from DHS. Initial TSCAP capability gaps have been made public in an un-prioritized list in the TSA Strategic Five Year Plan and can be used to guide research and development.

Impact of TSCAP

In the past, TSCAP has been used to justify investment decisions in checkpoint and checked baggage programs. TSCAP is expanding to include mission essential capability identification across the enterprise as TSA moves to inform investment decisions aligned to JRIMS, a DHS-wide process focused in mitigation of capability gaps.

Purpose

TSCAP provides a **structured, repeatable** and **transparent** process that strengthens TSA's ability to establish enterprise level capability gaps. Key elements of TSCAP include:

1. **What is the problem:** Establish the capability gap
2. **Why we need to solve it:** Establish the risk of the gap
3. **How we can solve it:** Document Courses of Action

Traceability

The TSCAP process identifies TSA capability gaps in meeting the TSA desired state. These gaps should identify:

1. Differences between current state and desired state;
2. Identify all of the current efforts underway to address the gap(s);
3. Relationship of gaps/current efforts;
4. The risk(s) associated with each gap.

Benefits

- **A comprehensive view of essential capabilities needed to perform TSA's mission**
- **An understanding of capability gaps that impact multiple offices**
- **The ability to make prioritized decisions**
- **A rationale for potential GAO/OIG audits**
- **Well-documented justification for establishing and funding programs**

TSA International Collaboration

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Aviation Security Commensurate Levels of Security Screening Capabilities

1. **Increases Security Effectiveness**: Improvements to the global aviation security baseline by raising minimum system performance levels to more effectively and efficiently mitigate threats to transportation in the US and abroad
2. **Original Equipment Manufacturers (OEM) Efficiencies**: Reduces industry development timelines and costs by focusing limited resources on a common set of global market requirements
3. **Drives Innovation**: Incentivizes OEMs to become more innovative to distinguish product lines from competition (i.e. larger threat libraries, increase sensitivity, lower operating costs and increase reliability)
4. **Manage Unknowns:** Reduces the number of unknowns to foster better risk picture while eliminating questions surrounding the difference between US/EU security measures
5. **Increases Industry Vitality**: Enables Industry to deliver products to an expanded international global aviation market
6. **Reduces Test Burden**: Commensurate detection standards and testing methodologies to potentially reduce demands on US/EU test centers through reciprocity and limiting assessments to unique requirements

Technology Work Streams

Current Technologies

Explosive Trace Detection

Enhanced Metal Detectors

Advanced Imaging Technology/

Security Scanners

Advanced Technology/

Explosive Detection Scanners for Cabin Baggage (EDSCB)

Explosive Detection Systems

Bottled Liquid Scanners/

Liquid Explosive Detection Systems (LEDS)

Future Technologies

?

Explosive Vapor Detection

?

Shoe Detection

Commensurate Opportunities

- **Threat Lists:** Substances, Concentrations, Density Ranges, Formulations, Characterization Data, etc.
- **Consistent Performance Requirements:** Probability of Detection, Probability of False Alarms, CONOPs (Laptops/ Liquids), etc.
- **Consistent Testing Protocols:** Detection Sets, False Alarm Sets, Confidence Levels, Quality Control, Threat Orientation, etc.
- **Consistent Reporting:** Certification/Approval letters, Reporting, vendor debriefings, Information Sharing with airports and End Users
- **Reciprocity:** Mutual acceptance of test results and identified procurement entrance criteria

Next Steps

- Collaboration with key EU Member States on new aviation screening technology capabilities in the US and abroad
- Collaboration with ECAC through the Technical Taskforce and Technology Study Groups on threat lists, threat masses, and common testing methodologies
- Work with EC, ECAC and EU Member States to expand TSA/EU databases of international classified detection standards, common testing methodologies, and test data (level 1, 2, 3 reports)
- Strengthen collaboration with EU industry representatives (ACI Europe/ EOS) to drive innovative screening solutions and help predict market and revenue streams
- Expanded focus on leveraging information sharing agreements with ASIA, Middle East, and Western Hemisphere partners to continue supporting next generation solutions
- Host and participate in US/EU test center exchanges to instill great consistency in testing methodologies and common evaluation process

Office of Requirements and Capability Analysis (ORCA)
Requirements and System Engineering

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So What, Who Cares?

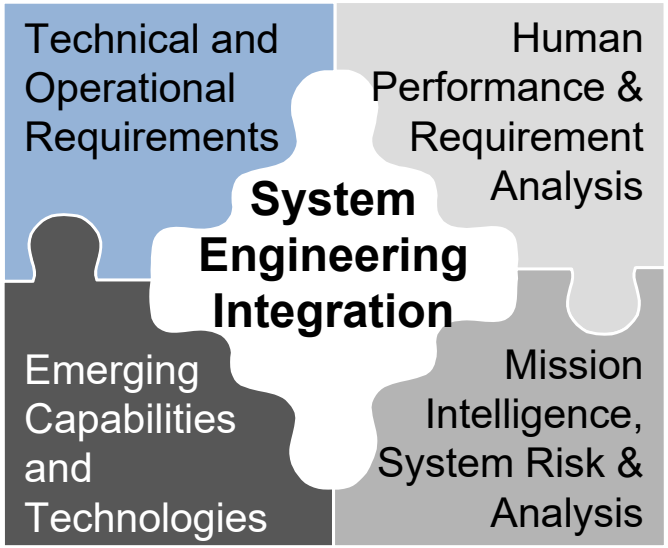
ORCA System Engineers are responsible for executing system level engineering at all technology readiness levels, integrating mission intelligence, risk, and human factors analysis, ORCA System Engineers are responsible generating robust requirements and capability analysis that close capability gaps and advance the overall security capabilities for the Transportation Security Administration

Technology Portfolios

- Translates user needs into technical requirements
- Evaluates current and emerging technologies and associated security capabilities

System Architecture

- Proactively define targeted screening capabilities at a system level and ultimately enable an integrated, interoperable, and modularized security screening system



Human Factors

- Provides user input to translate into technical requirements and performance improvements
- Reduce operational complexity of security technology and processes and gathers end-user input and feedback

System Risk and Analysis

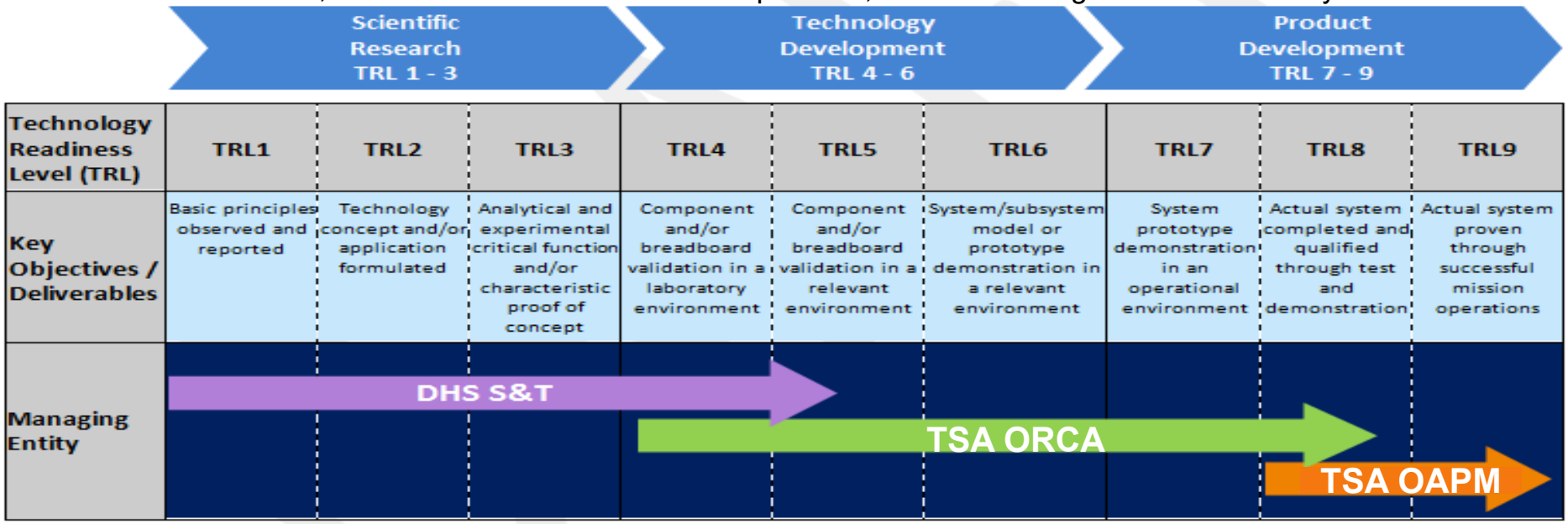
- Improve understanding of adversary characteristics and preferences; conduct risk analysis of various populations to inform leadership decisions and operations; model adversary assumptions and development

ORCA Requirements and System Engineering Partners & Resources

- Office of Acquisitions and Program Management (**OAPM**)
- Office of Contracting and Procurement (**OCP**)
- Office of Global Strategy (**OGS**)
- Office of Intelligence & Analyses (**OIA**)
- Office of Information Technology (**OIT**)
- Office of Training & Development (**OTD**)
- Office of Inspection (**OOI**)
- Office of Security Operations (**OSO**)
- **ORCA Divisions:** to include Intermodal, Innovation Task Force, System Architecture, System Risk and Analysis, Operations and Improvement
- Office of Chief Risk Officer (**OCRO**)
- OAPM Test & Evaluation
- **External Partners:** DHS S&T, TSL, TSIF, TRMG, National Labs, CBP. USSS, DHS Centers of Excellences, Foreign Delegations & Government regulators, and DOE Labs

Technology Development Process

TSA's approach to achieving transformational improvements in passenger and checked baggage screening is centered on collaboration with S&T, academic and commercial R&D partners, and the existing vendor community.



Focus Areas

- **Capability Development & Planning:** *Provides system level engineering analysis, establishes holistic system architecture definition, and identifies innovative security concepts through the various acquisition strategies, Broad Agency Announcements, and Interagency Partners that can that can be applied to support TSA's mission.*
- **Preliminary Requirements Development:** *Conducts capability gap analysis and modeling and simulation to develop data-backed preliminary reports in support of the AD 102 process to include Detection Standards, p-MNS, high-level CONOPS, system-level analysis of alternatives, and unconstrained Operational Requirements Documents (ORD).*
- **R&D Coordination & Technology Transition:** *Works with Interagency & Foreign Partners, DHS S&T, OEMs, and ORCA Divisions and OAPM Programs to align user needs to technical requirements development. Also, engages industry and attends industry conferences (ALERT, ACC, ADSA, etc.).*

Technology Portfolio Impact

FY17 Highlights

- Completed data collection and Algorithm Development for Emerging Threats
- Further developed and evaluated Capability Gaps
- Awarded 3rd Party ATR development for Cargo Pallet Scanner
- Initiated Data Collection & Preliminary Design Reviews for Machine Learning Applications
- Continued OTAP development & Awarded Increment 4&5 for TRAP
- Supported various Industry and External stakeholder engagement
- Continued support and BAA evaluations for TSIC and S&T EXD Apex Screening at Speed

CORE FUNCTION	EXAMPLE	IMPACT
Capability Development and Planning	▪ **Algorithm Development and Automated Threat Recognition (ATR)** ▪ *OEM Emerging Threat & Detection Tradespace Analysis* ▪ *Third Party ATR* ▪ *Machine Learning* ▪ **Improved Threat Discrimination:** ▪ *Differential Phase Contrast* ▪ *Multi Energy Detectors*	• Ability to fund innovative concepts that align to specific capability gaps based TSA priorities. • Capability inject and Technology roadmaps will help guide procurement strategies that align to relevant capability gaps.
Preliminary Requirements Development	▪ **Next Generation Alarm Resolution:** ▪ *Executed the TSCAP process in support of the development of requirements for CBRA operations* ▪ *Test & Evaluation of Homemade Explosive Detection* ▪ **Next Generation Explosive Detection System:** ▪ *EDS-CP2 Multi-Track Rolling Qualified Products List*	• Support System Engineering Life Cycle of TSE by identifying mitigation options for selected gaps, assist in strategic planning and develop operational requirements and concept of operations for material solutions
R&D Coordination & Technology Transition	▪ **Standards and Interface Requirements:** ▪ *Digital Imaging and Communications in Security (DICOS)* ▪ *ANSI N42.45 Image Quality Integration* ▪ *Common Graphical User Interface (CGUI) for EDS* ▪ **System Architecture Implementation** ▪ *Open Threat Assessment Platform (OTAP)* ▪ *TSE Requirements Analysis Platform (TRAP)*	• The promotion of standards, interface requirements, and Iterative development facilitate the planning and oversight of RDT&E activities; supporting the enhancement of aviation, mass transit, and security operations.

Advancement of Checked Baggage Security Systems (CBSS)

One primary task and four supporting tasks with possible multiple awards for each task area to expand innovation and participation for capability development.

Primary Task

1 Explosive Detection Equipment Development

Equipment (both hardware and software) shall be developed to the requirements and Original Equipment Manufacturers (OEMs) should integrate technology as appropriate from multiple sources to meet strategic planning and acquisition strategy

5 Infrastructure Components

Other infrastructure components that interface to checked baggage systems such as, but not limited to, BHS enhancements & RBS concepts

Collaboration & Integration

Informs

Collaboration & Integration

Supporting Tasks

2 Supporting Analytical Tasks

Advance the detection capability of the equipment (3rd party or non-OEM organizations may be viable).

3 Current TSE Platform Detection Assessment

Specific testing of OEM equipment to extend or enhance the detection capability particularly to expand RORs.

4 Architectural Components

Develop or mature needed component technology required by the OEM (relationship between OEM and 3rd party must exist).

Sub-Task Themes

Connected Technology - A system of systems approach to security requires that technology be connected throughout the infrastructure

Common Approach - In order to achieve a "System of Systems" , create a common framework that all checked baggage TSE will operate within.

Key Objectives

- **Threat Detection at highest capability on the new Detection Standard**
- **Alarm Resolution:** Increase effectiveness, discrimination and/or enhance capability resolve alarms produce by ATR
- **Key Performance Parameters**: Maintain and/or improve throughput, reliability, safety, and cyber security resilience

Collaboration and *Integration* between Original Equipment Manufacturer(s) and Other Organizations are key for task 1, 2, 4, and 5.