

Operational Changes and Implications for Technology

Anne Cowan
Bonnie Kudrick
Ron Mildiner
Steve Sciulli



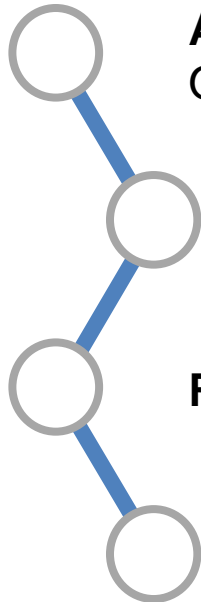
TSA/ACC Security
Capabilities Workshop
July 18, 2017



Transportation
Security
Administration

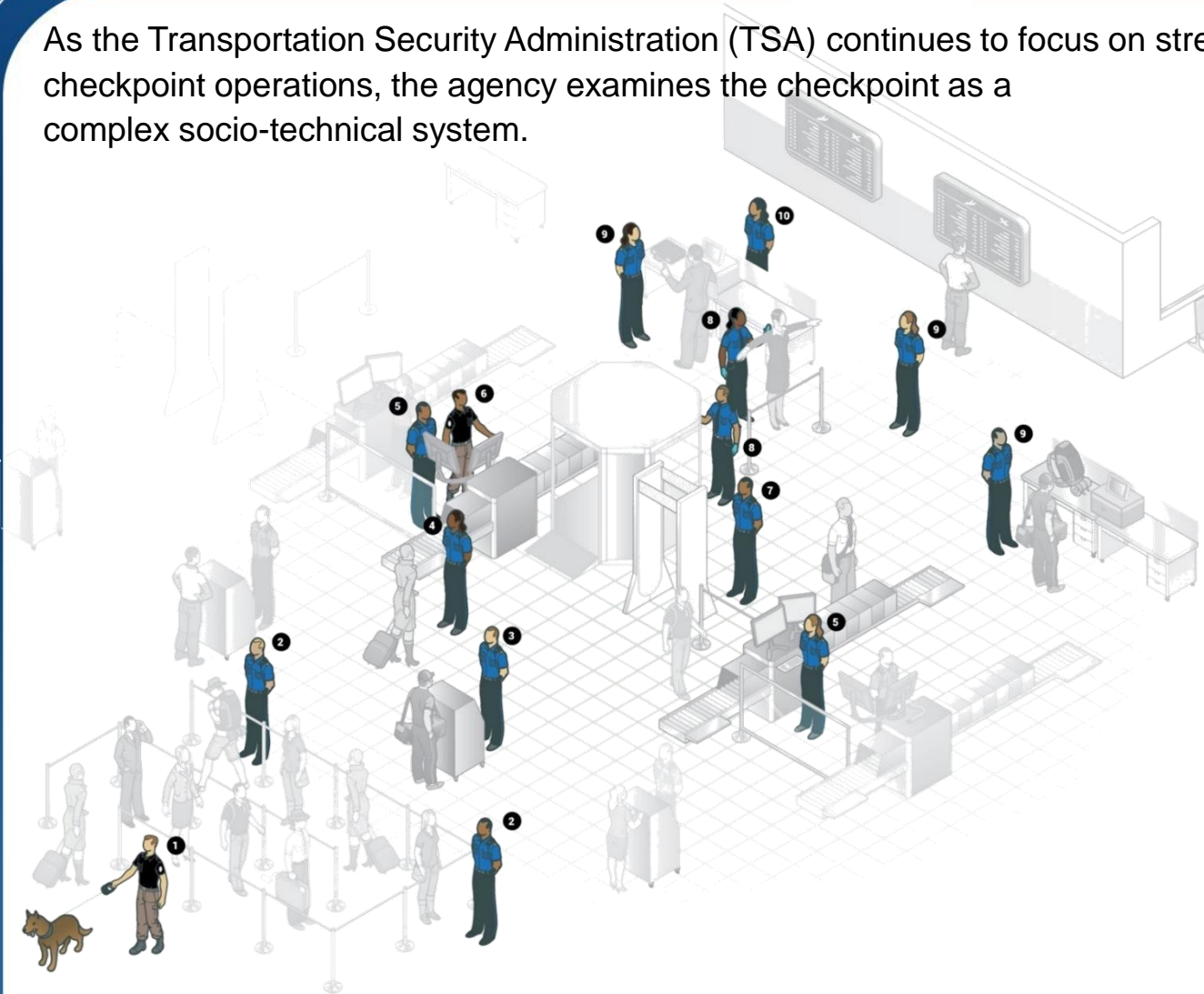


Panel Members

- 
- Anne Cowan** – Acting Division Director, Capabilities Management Division, Office of Requirements and Capabilities Analysis
 - Bonnie Kudrick** – Branch Manager, Human Performance Branch, Office of Requirements and Capabilities Analysis
 - Ron Mildiner** – Deputy Federal Security Director, DCA
 - Steve Sciulli** – Program Analyst, Office of Global Strategies

Human Performance and Checkpoint Operations

As the Transportation Security Administration (TSA) continues to focus on strengthening checkpoint operations, the agency examines the checkpoint as a complex socio-technical system.



A Checkpoint Team



1. Passenger Screening Canine Team
Specially trained canines can detect explosives odors in bags or on people.



2. Behavior Detection
Actively engages passengers and observes for indicators of an imminent attack.



3. Travel Document Check
Verifies boarding passes and identification documents.



4. Divest
Prepares the passenger for the screening process.



5. X-ray
Identifies potential explosives and other prohibited items.



6. Explosives Specialist
Responds to suspicious X-ray images. Trains officers on explosives recognition.



7. Walk Through Metal Detector
Screens for hidden guns, knives, and explosives components.



8. Advanced Imaging Technology
Screens for prohibited items hidden on the body.



9. Explosives Trace Detection
Detects the minutest particles of explosives residue.



10. Supervisor
Coordinates the team and provides first-line oversight.

Vision and Functional Statements







The Office of Requirements and Capabilities Analysis (ORCA) and its subcomponents have developed functional statements that define roles and responsibilities for supporting the ORCA mission, and enable coordinated development of capabilities and resources at both the ORCA and enterprise levels.

ORCA Mission



ORCA is responsible for driving the strategy and development of TSA's security architecture and operational capabilities to enhance security and optimize mission performance through analysis and innovation.

ORCA Capabilities Management Division (CMD) Functional Statements

-  Represent ORCA as the delegated Lead Business Authority (LBA) in Acquisition Program Integrated Project Teams (IPTs) and key Acquisition Program review points.
-  Coordinate with other ORCA divisions to represent the LBA at each of the System Engineering Lifecycle reviews. This includes such activities as determining if functional requirements and test procedures translate to user needs, and if the planned solution and developed solution meet the user need.
-  Evaluate existing deployed operations to determine areas for improving operation of existing capabilities. This may include identifying procedural improvements, training improvements, and/or minor software/hardware improvements. Software/Hardware improvements will be coordinated with the responsible Acquisition Program.
-  Support operational training and field mentoring by developing and disseminating supplemental operational guidance and tools to improve operational efficiency and effectiveness and understanding of system performance.
-  Responsible for establishing the rates and standards relating to operational performance utilized by the Office of Security Operations (OSO) Staffing and Scheduling Branch as an input to determine the annual Full-Time Equivalent (FTE) budget and resource allocations for all airports.
-  Provides Operational modeling and Simulation expertise, responsible for the development, validation, sustainment, and deployment of operational simulation models.

Vision and Functional Statements

ORCA and its subcomponents have developed functional statements that define roles and responsibilities for supporting the ORCA mission, and enable coordinated development of capabilities and resources at both the ORCA and enterprise levels.

ORCA Mission



ORCA is responsible for driving the strategy and development of TSA's security architecture and operational capabilities to enhance security and optimize mission performance through analysis and innovation.

ORCA Human Performance Branch (HPB) Functional Statements



Conduct analysis and provide human factors expertise to ensure tasks, functions, information, processes, procedures, tools, and environmental conditions optimize end user performance.



Enhance human performance by directing in-depth analysis on specific operational concerns/issues to clarify requirements and identify operator improvement opportunities, including innovative concepts, which evaluate and advance human and machine interactions.



Coordinate closely with OSO, the Office of Human Capital, and the Office of Training and Development, and other TSA stakeholders as appropriate to develop procedures and training, validate Concepts of Operations (CONOPs), and review operational guides, serving as human factors Subject Matter Experts (SMEs) to enhance performance.



Identify opportunities for increased passenger experience improvement based on analysis and field trials.



Coordinate closely with the Innovation Task Force (ITF) Division and requirements groups to improve human-systems integration.



Develop analytic capabilities/resources to address full/systemic range of Human Performance issues that impact the TSA mission, including but not limited to person-machine interface.

Checkpoint Operations as a Complex Socio-Technical System



Summary

As the operational arm of TSA, Transportation Security Officers (TSOs) represent the front line of physical security screening operations for all commercial airline passengers, baggage, and cargo. ***Characterizing the checkpoint as a complex socio-technical system allows for a macro-ergonomic approach*** that takes into consideration job task analyses, performance assessments, TSO perceptions, workforce scheduling, training considerations, and operational requirements.



Challenges

One of TSA's primary challenges is to optimize human performance of screening tasks across the agency in order to enhance security effectiveness and efficiency. This involves ***ensuring that officers consistently follow Standard Operating Procedures (SOPs), mitigating peer pressure within the checkpoint environment, decreasing distractions due to noise and lighting, and optimizing officer cognitive load.***

Mitigating Challenges



TSA is working to address operational challenges by leveraging strategic partnerships with TSA-internal stakeholders, airport authorities, original equipment manufacturers, and national recognized laboratories. These partnerships are working towards enabling the development of innovative and data-driven security solutions.

Human Performance Branch Designated Research Airport (DRA) Partnership

HPB and OSO have established agreements to facilitate field data collection at DRAs. DRAs give HPB access to officers for data collection efforts that frequently include *officer focus groups*, *individual interviews with officers*, and *checkpoint observations*.

Throughout this process, *airports and officers receive early exposure to cutting-edge technology, processes, and research*, and officers are able to provide direct feedback to Headquarters personnel.



Data collection at an HPB DRA

Human-Focused Capabilities

- Human proficiency analysis
- Training requirements
- Technology and engineering optimization
- System and process design
- Tool creation

Key Datasets

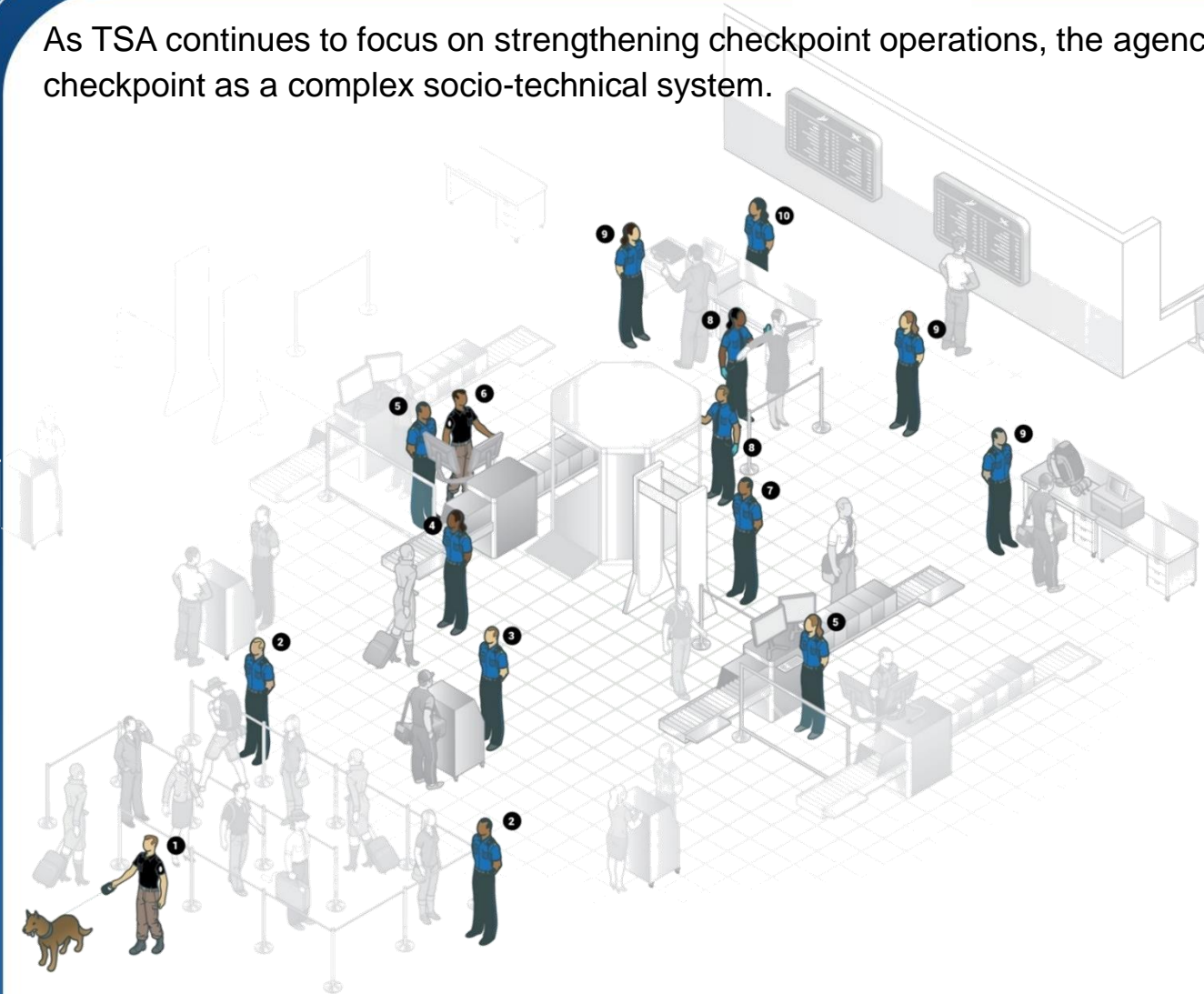
- Performance metrics
- Feedback and usability metrics for technology
- Officer aptitudes
- Optimal duty cycle times for officers
- Cognitive burden

Partnerships











- Office of Security Operations (OSO)
- Office of Human Capital (OHC)
- Office of Training & Development (OTD)
- Department of Homeland Security Science and Technology (DHS S&T)
- 11 Designated Research Airports (DRAs)

Human Performance and Checkpoint Operations

As TSA continues to focus on strengthening checkpoint operations, the agency examines the checkpoint as a complex socio-technical system.



A Checkpoint Team

- **1. Passenger Screening Canine Team**
Specially trained canines can detect explosives odors in bags or on people.
- **2. Behavior Detection**
Actively engages passengers and observes for indicators of an imminent attack.
- **3. Travel Document Check**
Verifies boarding passes and identification documents.
- **4. Divest**
Prepares the passenger for the screening process.
- **5. X-ray**
Identifies potential explosives and other prohibited items.
- **6. Explosives Specialist**
Responds to suspicious X-ray images. Trains officers on explosives recognition.
- **7. Walk Through Metal Detector**
Screens for hidden guns, knives, and explosives components.
- **8. Advanced Imaging Technology**
Screens for prohibited items hidden on the body.
- **9. Explosives Trace Detection**
Detects the minutest particles of explosives residue.
- **10. Supervisor**
Coordinates the team and provides first-line oversight.