Touchless Screening

July15, 2022

Fiscal Year 2022 Report to Congress

Homeland Security

Transportation Security Administration

Message from the Administrator

July 15, 2022

I am pleased to present the following report, "Touchless Screening," which was prepared by the Transportation Security Administration (TSA).

This report was compiled in response to direction in the Joint Explanatory Statement accompanying the Fiscal Year (FY) 2022 Department of Homeland Security (DHS) Appropriations Act (P.L. 117-103). It discusses TSA's efforts to ensure sanitary checkpoints, ongoing touchless screening initiatives, and proposals for acquisition of touchless screening technologies.

Pursuant to congressional requirements, this report is being provided to the following Members of Congress:

The Honorable Lucille Roybal-Allard
Chairwoman, House Appropriations Subcommittee on Homeland Security

The Honorable Chuck Fleischmann
Ranking Member, House Appropriations Subcommittee on Homeland Security

The Honorable Chris Murphy
Chair, Senate Appropriations Subcommittee on Homeland Security

The Honorable Shelley Moore Capito
Ranking Member, Senate Appropriations Subcommittee on Homeland Security

Inquiries relating to this report may be directed to me at (571) 227-2801 or to TSA's Legislative Affairs office at (571) 227-2717.

Sincerely,

David P. Pekoske
Administrator

Executive Summary

This report responds to the requirement for an update on touchless screening as outlined in the Joint Explanatory Statement accompanying the FY 2022 DHS Appropriations Act (P.L. 117-103). TSA's activities support its strategic goal of "Accelerating Action" by building a culture of innovation that anticipates and rapidly counters changing threats and rapidly fields innovative solutions. Additionally, these activities support DHS's mission and the Secretary's priorities for responding to the Coronavirus Disease 2019 (COVID-19) pandemic and for creating a modernized lower touch security environment while maintaining security effectiveness. TSA took the following actions in response to COVID-19:

- Deployed acrylic-shield barriers to high-contact areas in checkpoints to protect both local Transportation Security Officers (TSO) and passengers;
- Developed a comprehensive set of enhanced cleaning guidelines for the entire TSA enterprise and initiated contracts and/or reimbursed airports to ensure that cleaning services were paid for;
- Updated standard operating procedures at security checkpoints and established a new infection-control monitor position to ensure that new guidelines and processes are followed;
- Worked with industry partners to accept the donation of antimicrobial bins that enhance bin cleanliness and increase the traveling public's confidence in the safety of this high-touch area;
- Launched a "Stay Healthy. Stay Secure." campaign to keep the traveling public informed of TSA protocols and created a public webpage to broadcast important announcements;
- Developed a variety of communication vehicles for TSOs (playbooks and security notices) to share the latest information and procedural changes rapidly; and
- Supported a variety of international and interagency partnership efforts to standardize and document COVID-19 response efforts, such as the publication of the *Runway to Recovery* guidance document.

TSA also has prioritized the deployment of technology enhancements and solutions and has explored other solutions to accelerate progress toward a lower touch screening experience. Solutions either deployed or explored for potential use include:

- The use of ultraviolet light for disinfection of surfaces within the security checkpoint environment;
- The deployment of 300 computed tomography (CT) units procured in 2019 and an additional 314 CT units procured in 2022 as part of the Checkpoint Property Screening System program;
- The evaluation of stand-off detection technology to minimize the need to be near or to have physical contact between TSOs and passengers;
- The evaluation of explosive vapor detection to provide a touchless alternative to secondary screening solutions;

- The development of upgraded algorithms to achieve lower false alarm rates for the current advanced imaging technology (AIT) fleet that dramatically decreased touching that occurs because of reduced false alarms;
- The testing completion on the Quick Personnel Security 201 Scanner, which is an AIT unit that allows for an arms-down passenger stance that may ease the passenger screening process and that may enable TSOs to review alarm images and screen passengers simultaneously at alternative locations;
- The upgrade to the Credential Authentication Technology machines with biometric, digital identity, and self-service capabilities;
- The integration of a digital identification document (ID) authentication capability with CAT-2 to verify a passenger's identity at the airport checkpoint;
- The inaugural launch completion of the digital ID solution, in coordination with Apple and the Arizona Department of Motor Vehicles on March 23, 2022, at select Phoenix Sky Harbor International Airport TSA PreCheck® lanes;
- One-to-few facial identification capabilities testing by using U.S. Customs and Border Protection's Traveler Verification Service to compare a passenger's live image to a gallery of pre-enrolled reference photos.
- Conducting research and development in support of enhanced contactless alarm resolution countermeasures, with the goal of requiring fewer types of containers to be touched, handled, or opened by TSOs;
- Co-leading, with the DHS Science and Technology Directorate's Screening-at-Speed Program, the development of checkpoint technology solutions to include self-screening of TSA PreCheck® passengers resulting in fewer patdowns and decreased contact with TSOs; and
- Testing a crowd movement analytics solution supported by the DHS Silicon Valley Innovation Program to support symptom identification and social distancing efforts.

In addition, TSA conducted a touch-rate analysis to assess the impact of these changes on the level of direct and indirect touch between passengers and TSOs. Preliminary findings for the first phase of the touch-rate analysis indicate that direct touch was reduced by 10 percent and that indirect touch was reduced by 51 percent.

TSA is engaged continuously with a variety of stakeholders to source best practices and effectively socialized solutions to the traveling public and to the TSA workforce, ensuring awareness of security environment changes. TSA will continue to respond to the latest guidance and will innovate to provide a safe, secure, and sanitary security environment for the traveling public and for TSA's workforce.

Touchless Screening

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I. Legislative Language

This document has been compiled in response to direction in the Joint Explanatory Statement accompanying the Fiscal Year (FY) 2022 Department of Homeland Security (DHS) Appropriations Act (P. L. 117-103), which states:

> *Touchless Screening.*—Within 90 days of the date of enactment of this Act, TSA shall provide a report to the Committees detailing options to enhance Transportation Security Equipment capabilities to limit interactions that are not conducive to a touchless screening environment without adversely impacting the core security mission.

II. Background

When the Coronavirus Disease 2019 (COVID-19) pandemic emerged as a major threat, the Transportation Security Administration (TSA) stood up the Critical Incident Management Group to direct TSA's immediate response. Subsequently, TSA formalized a Pandemic Planning Executive Committee composed of a variety of workgroups dedicated to various aspects of the response. These workgroups collaborated within TSA, with interagency partners, and with the aviation security industry to implement procedural changes and technology solutions to mitigate the spread of COVID-19 at airports, using funding from the Coronavirus Aid, Relief, and Economic Security (CARES) Act.

III. Procedural Efforts and Initiatives to Create a Low-Touch and Sanitary Checkpoint Environment

To address the COVID-19 threat, TSA brought low-cost procedural and technology mitigation solutions to security checkpoints across the Nation. Some of these solutions included:

- Changes in procedures;
- Enhanced cleaning standards for airports;
- Installation of acrylic-shield barriers;
- Adjustment of current technologies to be lower touch; and
- Deployment of personal protective equipment (PPE).

These efforts were coordinated closely with stakeholders and allowed TSA to protect passengers and transportation security officers (TSO) better from the virus and to create a sanitary, touchless travel experience while maintaining security effectiveness.

A. Procedural Changes

TSA conducted an in-depth review of all screening policies and procedures to determine opportunities to increase the health and safety for TSA's workforce and for the traveling public. TSA also conducted risk assessments after identifying proposed modifications to ensure that changes did not affect security effectiveness negatively or did not compromise individual privacy, civil rights, and civil liberties.

Throughout the response, TSA delivered modified policies and procedures to the field through a new security notice format. This format was developed in March 2020 to deliver comprehensive procedural information rapidly to all front-line officers and field leadership.

Following the release of several security notices, a variety of stakeholders discussed additional screening policies, procedures, and safety measures, including short- and long-term options, with applicable TSA stakeholders. These discussions led to the development of COVID-19 standard operating procedures (SOP), which were released in May 2020, and consolidated procedures and best practices from several security notices into one document. Since the release of the COVID-19 SOP, TSA continues to refine its procedural guidance to integrate best practices and public health guidance in consultation with TSA's Office of Occupational Safety, Health, and Environment and Office of Chief Counsel. TSA's modified procedural responses to COVID-19 are listed in **Figure 1**.

Figure 1: Modified Screening Procedures

Modified Screening Procedures	
Mask Requirement	Mandatory for all individuals (complies with executive and Centers for Disease Control and Prevention (CDC) orders)[1]
Social Distancing	Required between passengers and TSOs in all screening locations
Identification Document (ID) Verification	Passengers scan their own boarding pass, without physical contact between the TSO and passenger
Gloves	Mandatory use by TSOs while performing screening functions
Changing Gloves	Mandatory for TSOs after every on-person and in-property search, and every 30 minutes or sooner for other screening functions
Acrylic Barriers/ Face Shields	Required to the maximum extent possible during screening and when within 6 feet of, or closer to, others
Hand Sanitizer	Permitted in carry-on bags as medically necessary in quantities of up to 12 ounces; individuals must remove from their bags before X-ray screening
Commercial Disinfectants	Permitted uniformed and non-uniformed flight crew to bring commercial disinfectants of any size, so long as the item is not listed on the prohibited items list and it undergoes appropriate screening
Explosives Trace Detection	Swabs must be discarded after each use on passengers, their accessible property, or checked baggage.
Divestiture Requirements	Increased focus on: • removing specific items like belts and bulky jewelry on the passenger • removing food items to reduce alarms and the need for additional screening of passengers and accessible property • passengers divesting their own items and/or moving their own belongings through the checkpoint to limit physical/touching assistance provided by TSOs
Reduced Patdowns	• Use of alarm-resolution (AR) procedure, which allows for additional rescans with Advanced Imaging Technology (AIT) • Use of AR procedure, which enables passengers to adjust their clothing in nonsensitive areas for TSO visual inspection • Implement procedure for sensitive-area AR, which includes a patdown of the alarming area only • Increased use of a handheld metal detector to focus walkthrough metal detector alarms and to minimize the need for full-body patdowns • Modified procedure for passengers who appear 75 years of age or older, in a wheelchair or scooter

[1] As a result of a court order issued on April 18, 2022, the CDC order requiring masks on public transportation conveyances and at transportation hubs is no longer in effect.

B. Distribution of PPE

Throughout the pandemic, TSA has distributed gloves, eye protection, face masks, and face shields to protect its workforce and the traveling public. TSA required face masks for the traveling public prior to the April 18, 2022, district court ruling striking down the mask requirement on public transportation conveyances and at transportation hubs. Since that ruling, TSA continues to provide face masks for the traveling public, for TSA employees at the checkpoint, and for TSA employees in close contact with the public, as needed. TSA also requires and provides face shields for all screening employees in high-transmission areas, as well as for those in positions where they are within 6 feet of others and where no acrylic shield barrier is installed. Face shields were required for vaccinated employees for approximately 6 weeks only, but were required for unvaccinated employees until revision 4 of Administrative Directive, *Face Masks in TSA Facilities*, was issued on March 2, 2022.

TSA also requires TSOs to wear gloves and to change them frequently based on the level of passenger interaction. TSA revised its procedures to allow commercial disinfectants, like hand sanitizer, of any size or quantity through the security checkpoint for uniformed or non-uniformed crewmembers. As cited by the U.S. Government Accountability Office Audit 21-364, since fall 2020, TSA has maintained a 2-3-month stockpile of PPE, in addition to a 60-day inventory of PPE sufficient to meet requirements for 100 percent of security screening operations.

C. Social Distancing

Throughout COVID-19, social distancing policies were tailored to the unique layout and volume constraints of each airport and checkpoint. TSA continued to work with airport authorities, airlines, and tenant operators to ensure that space was maximized for effective social distancing. TSA also used infection control monitors, a position entrusted with ensuring that TSOs and passengers comply with COVID-19 response procedures, to remind passengers to maintain social distance from each other.

Moving forward, TSA is testing a crowd movement analytics solution supported by the DHS Silicon Valley Innovation Program. The solution includes a metric to measure the density of a crowd or queue, the length of time that the crowd is exposed to one another at that density, and the population size. The metric displays green, amber, and red dots to indicate low, medium, or high risks of viral transmission among members of the population. The analytics solution and associated metrics are being developed, collected, and verified still. Future social distancing procedures can include a three-level response effort that includes:

- Thermal cameras to identify passengers that show overheating symptoms;
- Physical separation measures to reduce congestion and to increase passenger separation; and
- Additional crowd management techniques.

D. Enhanced Cleaning Guidance

TSA updated its "Enhanced Cleaning Guidance," published in June 2020, to include:

- Cleaning all surfaces mentioned in the guidance at least once a day;
- Cleaning high-touch surfaces every 4 to 8 hours, depending on the number of passengers and level of community transmission;
- Cleaning and increased ventilation (if possible) after identification of a confirmed positive COVID-19 case (employee or passenger) either working at or passing through the checkpoint; and
- Only using cleaning products listed in the TSA transportation security equipment document.

In general, the guidance provides a uniform cleaning standard to limit the spread of COVID-19 at checkpoints and other security screening areas. It requires the use of a disinfectant approved by the U.S. Environmental Protection Agency upon job rotation every 30 minutes or as directed by the equipment manufacturer's specifications. TSA worked with its chief medical officer as well as with industry partners—including hardware manufacturers, airlines, and airport authorities—to develop these guidelines and will continue to refine them as needed based on evolving guidance from the CDC.

The CARES Act provided TSA with funding for additional cleaning procedures at federalized airports to include when a positive COVID-19 case is confirmed, and for cleaning teams that would sanitize checkpoints continuously.

E. Acrylic Shield Barriers

TSA deployed acrylic-shield barriers to high-contact areas in checkpoints to protect both TSOs and passengers. These areas include the travel document checker podium, the carry-on baggage divestiture area, lobby-installed checked baggage explosive detection systems, and the AR area. The barriers initially were sent to airports with the highest numbers of screeners, as well as to COVID-19 hot spots. TSA received FY 2020 funding from the CARES Act to pay for the acrylic-shield barriers. Airports not included in the first round of delivery had the option to purchase their own acrylic-shield barriers using TSA purchase cards.

TSA also was awarded an indefinite delivery/indefinite quantity contract to provide all airports with acrylic-shield barriers through a phased approach between June and September 2020. TSA received orders from more than 350 airports (more than 5,500 barrier kits) and has completed those deliveries. Moving forward, TSA field personnel have begun to remove temporary barriers used during the COVID-19 pandemic in areas of low transmission. These locations will continue to retain the barriers on hand in the event they are needed to re-deploy based on transmission levels.

F. Antimicrobial Bins at the Checkpoint

TSA worked with industry partners to accept the donation of antimicrobial bins for the automated screening lanes. These bins enhance cleanliness and increase the traveling public's confidence in the safety of this high-touch area. The bins have built-in surface protection to prevent the growth of microbes and bacteria, which enhances sanitization, although it is not necessarily effective against COVID-19. TSA published a list of tested and approved bins for purchase or donation and will continue to update that list as tests on other bins are completed.

G. Infection Control Monitor Position

TSA created and has maintained use of an infection control monitor position at checkpoints to ensure TSO and passenger compliance with COVID-19 response procedures. The infection control monitor provides guidance on cleaning protocols to TSOs, verifies that social distancing procedures are maintained, ensures that PPE (for example, face masks and gloves) is available and is worn correctly, and ensures that enhanced cleaning of high-touch surfaces is occurring.

H. Passenger Communications

TSA worked to ensure that its workforce and the traveling public understood the measures taken to respond to the COVID-19 pandemic and to improve workforce and traveler confidence at security checkpoints. To accomplish this, TSA used signage addressing COVID-19 procedures and social distancing to remind travelers to maintain distances during security screening operations. TSA also explored enhanced digital communications capabilities through hardware, such as digital totems, to provide targeted messaging to passengers for specific COVID-19 procedures.

TSA's "Stay Healthy. Stay Secure." campaign also provided information to the traveling public on the measures that TSA has taken to respond to the COVID-19 pandemic, building on the checkpoint communications, to provide passengers with information outside the checkpoint space. Travel tips, educational posts, and timely information about TSA's changes to the checkpoint are available in a variety of outlets, such as TSA's public COVID-19 website (www.tsa.gov/coronavirus), press releases, social media accounts, and blog, and segments on news channels. TSA also established reporting and tracking mechanisms to inform the public of the number and location of presumed or confirmed positive infections.

I. Communicable Disease Response Playbook

In June 2020, TSA introduced the "TSA Communicable Disease Response Playbook," which consolidated all of TSA's best practices and recommendations for security checkpoints to mitigate the spread of COVID-19. This playbook was shared with TSA leaders, federal security directors, industry stakeholders, vendors, and airlines. The playbook contains a series of solutions organized by theme:

- Minimizing touchpoints during the security process;

- Increasing social distancing;
- Enhancing cleanliness of the checkpoint;
- Requiring PPE; and
- Establishing new acquisition pathways.

The playbook includes an appendix with instructions, resources, and links to tactical information to implement these solutions in a variety of checkpoint environments. Everything is integrated and linked into one document for easy access by employees throughout the field. To date, all requirements that have been issued to the field are included in the playbook's sensitive security information appendix, including the COVID-19 SOP, security notices, and return-to-duty guidance.

To achieve maximum accessibility, the latest version of the playbook is available on the TSA News app as well as on TSA's COVID-19 iShare page, and updates are made regularly to ensure that the latest guidelines are published.

J. Interagency and International Stakeholder Coordination

TSA's response to COVID-19 was coordinated across all levels of the TSA enterprise, as well as with airlines, airports, industry, and interagency stakeholders, to ensure that its mitigation practices were current and consistent with other agencies across the Federal Government. Some examples of these collaborations are listed below:

- TSA leveraged its partnership with DHS's Science and Technology Directorate (S&T) in constructing its COVID-19 response. TSA established biweekly meetings and defined work streams with S&T's COVID-19 working group to leverage research and development (R&D) solutions to detect, mitigate, and reduce the spread of COVID-19 at checkpoints.

- S&T also worked closely with TSA's Innovation Task Force (ITF) to prepare to deploy elevated body temperature (EBT) screening across the enterprise. TSA was asked urgently by the National Security Council to review options for the potential deployment of EBT at TSA Checkpoints in the summer of 2020. The ITF assisted with the rapid exploration of technology and procedure options. Ultimately, TSA did not deploy the EBT as ITF did not receive the authority to deploy the capability. The TSA Systems Integration Facility lab assessment provided information related to the feasibility and effectiveness of the solution. S&T's relationship with TSA (and ITF specifically) was key to testing different EBT systems and to establishing a concept of operations if the units needed to be deployed.

- TSA also engaged the U.S. Department of Energy laboratories to gather information on planned and ongoing R&D work linked to mitigating the presence of COVID-19. TSA identified several linked projects including environmental sampling, closed-space modeling, antibacterial/antiviral solutions, and portable detectors.

- TSA, along with other DHS agencies, supported the publication of the *Runway to Recovery* guidance document, which provides airports and airlines guidance for implementing measures to mitigate the public health risks associated with COVID-19 and to prepare for an increase in travel volume, while ensuring that aviation safety and security are not compromised.[2] It addresses public health concerns comprehensively and consistently and supports U.S. air carriers and airports as they make decisions and implement changes, such as efforts to create a more low-touch screening environment, related to reducing the spread of COVID-19.

International coordination was another essential part of achieving TSA's goal to find, implement, and communicate best practices for COVID-19 mitigation. Some examples of TSA's international collaborations are listed below:

- TSA conducted conference calls with more than 20 international partners such as Canada, Mexico, China, and Germany, to share best practices and lessons learned on detection and mitigation of COVID-19 at airport checkpoints. These calls led to the exchange of test reports, procedures, and guidance material used in the United States and abroad, including TSA's "Communicable Disease Playbook" and enhanced cleaning guidance.

- TSA organized opportunities for S&T to share its latest R&D findings with cleared foreign partners and industry representatives. It also participated in multilateral meetings to help to set and influence voluntary international COVID-guidance, such as the International Civil Aviation Organization's Council for Aviation Recovery Taskforce Guidance.

K. Advisory Panels

Another key to TSA's success managing COVID-19 changes at checkpoints was early and consistent engagement with stakeholders through an advisory panel structure.

TSA established an advisory panel of federal security directors from across the country that met weekly to provide feedback and to discuss progress. Feedback from the field was particularly valuable as TSA rapidly responded to the evolving threat of COVID-19. Candid questions and feedback on how response solutions would affect field operations allowed TSA to troubleshoot and deploy effective solutions to the field. Consistent communication with the field allowed TSA to pinpoint existing and emerging threats not evident from TSA Headquarters' perspective.

TSA also established a panel of current and former industry executives with expertise in aviation, security, acquisition, and public health. This panel of industry executives met bi-weekly, helping TSA leaders to gain feedback on specific solutions and allowed the panelists to communicate TSA's progress to external stakeholders.

[2] *Runway to Recovery, the United States Framework for Airlines and Airports to Mitigate the Public Health Risks of Coronavirus*, guidance jointly issued by the U.S. Departments of Transportation, Homeland Security, and Health and Human Services (July 2020). (DHS, DOT, and HHS Issue New Guidance for Airline Industry Partners to Facilitate Safe Air Travel | Homeland Security)

IV. Procurement and Acquisition of Touchless Screening Technologies

TSA identified several needs to enhance its ability to mitigate the spread of COVID-19 through its enhanced touchless screening environment. For all existing and proposed screening technologies, balancing passenger security and privacy will continue to be TSA's priority and an underlying principle in assessing promising solutions.

A. Eliminating Touchpoints During Travel Document Checking

Traditionally, identity authentication at the checkpoint required a physical interaction between the TSO and the passenger. As the entry point to the screening process and the initial determination for the passengers' level of screening, TSA must verify a passenger's identity effectively and efficiently. Consistent with its security imperatives, TSA is exploring efforts for decreasing touchpoints between TSOs and passengers during travel document checking.

At the onset of COVID-19 in March 2020, TSA collaborated with its credential authentication technology (CAT) vendor and other stakeholders to explore if changes to existing CAT systems could provide a safer checkpoint experience while maintaining the same level of security authentication. To increase social distancing, to limit cross-contamination, and to reduce the interaction between TSOs and passengers, TSA instituted an immediate procedural solution of rotating the CAT to make it more self-service, but required a more sustainable, permanent material solution moving forward.

TSA is upgrading CAT machines with biometric, digital identity, and self-service capabilities (CAT-2) in response to COVID-19 and the growing availability of robust identity solutions in the market. Biometric technology and automation can increase aviation security effectiveness, particularly at the airport checkpoint, by enhancing current ID verification procedures and by allowing professional screening personnel to leverage their training and experience to focus more on alarms and error resolution.

CAT-2

TSA is testing one-to-one (1:1) facial matching capabilities by integrating biometric capture with CAT to verify a passenger's live image against the image on their photo ID (for example, a passport or driver's license). Known as CAT-2, 1:1 facial matching does not require a database of pre-staged passenger biometric images. Instead, it simply compares an image from the document presented by the passenger against an image taken of the passenger at the checkpoint.

Because of collaborative efforts, TSA was able to plan and initiate a demonstration of CAT-2 at Ronald Reagan Washington National Airport (DCA) in August 2020. Based on further analysis of the DCA demonstration, TSA conducted formal field tests with volunteer passengers at DCA, Miami International Airport (MIA), Indianapolis International Airport, and Phoenix Sky Harbor International Airport (PHX). These tests helped to identify, evaluate, and mitigate system performance issues across diverse operational environments and passenger demographics. TSA plans to conduct additional CAT-2 pilots in 2022.

Integration of Digital Identity

To support the touchless checkpoint experience further, TSA deployed 122 CAT-2 units in February and March 2022 to evaluate the operational effectiveness of 1:1 facial matching and the interoperability of standard-based digital IDs.[3] TSA is exploring the integration of a digital ID authentication capability with CAT-2 to verify a person's identity at the airport checkpoint using the digital ID information. Digital ID also includes the mobile driver's license, or mDL. An mDL is a digital representation of the information contained on a physical driver's license, stored on or accessed through a mobile device, such as a smartphone. It is considered a complement to, not a replacement for, a physical driver's license or ID.

TSA is coordinating with stakeholders and is aligning to industry standards to develop a digital identity capability that serves as a secure, digital protocol for handling nonphysical credentials at the checkpoint. Independently of how the mDL information is transmitted to TSA, TSA will verify the authenticity of the identity through digital signature verification against the issuing authority. TSA will establish ownership of the data by performing a 1:1 facial matching, biometrically linking the person passing the data to the photo associated with the digital mDL.

The inaugural launch of the digital ID solution, in coordination with Apple and the Arizona Department of Motor Vehicles, occurred on March 23, 2022, at select TSA PreCheck® lanes in PHX. Apple publicly has announced 12 additional states that will allow their driver's licenses to be provisioned to the Apple Wallet in the future. The exact states and sequencing is subject to change based on Apple's work with the states. Assuming requisite polices are approved for the acceptance of mDLs, availability of funding, and successful testing, TSA plans to upgrade all deployed CATs with the ability to accept mDLs in FY 2024. TSA is working continually with additional industry partners and states to enable the use of other digital IDs at the TSA checkpoint.

TSA PreCheck®: Touchless Identity Solution

TSA also is testing one-to-few facial identification capabilities by using the U.S. Customs and Border Protection's (CBP) Traveler Verification Service to compare a passenger's live image to a gallery of pre-enrolled reference photos. This solution, known as TSA PreCheck®: Touchless Identity Solution, is being tested only for the Trusted Traveler population right now (for example, TSA PreCheck® and CBP Global Entry members). This solution also will be integrated with the CAT-2 platform. TSA began piloting it at Detroit Metropolitan Wayne County Airport checkpoint in March 2021. In November 2021, the pilot was expanded to support the baggage-drop touchpoint at Hartsfield-Jackson Atlanta International Airport (ATL). In 2022, the pilot will include the ATL checkpoint.

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[3] Digital ID was developed using standards in the fields of information and communications technology by the National Institute of Standards and Technology and the International Organization for Standardization/International Electrotechnical Commission.

B. Improving On-Person Screening

TSA has deployed AIT[4] enhancements to reduce touch, to improve passenger experience, and to provide clarity to TSOs when groin patdowns are required. Combined with procedure updates, these enhancements demonstrated a statistically significant reduction in groin patdowns at Category III/IV airports with AITs that have the Target Threat Algorithm.

In addition to the enhancements made to AIT systems in response to COVID-19, TSA is proposing a multiyear program to implement solutions quickly that reduce touch rate, increase threat detection, and reduce false alarms. These solutions also promote social distancing, reduce TSO contact with passengers, and reduce contact between passengers.

Software Enhancements and Upgrades to AIT

TSA also is investing heavily in the development of upgraded algorithms to achieve lower alarm rates for the current AIT fleet. Initial testing in the lab has shown one of these, known as the AIT Low Probability of False Alarm algorithm, to increase detection to address emerging threats while decreasing the current alarm and passenger-touch rate by 50 percent. Additional field testing is ongoing to verify this capability.

If field testing is positive, this algorithm will provide TSA with enhanced detection capabilities and an improved passenger experience. Using machine learning, the algorithm allows for dramatically decreased touching because of reduced false alarms. At the same time, because the algorithm is gender-neutral, TSOs no longer will have to ascertain a passenger's gender before the passenger enters the AIT. Other enhancements also will contribute to increased detection capability and lower false-alarm rates.[5]

TSA also will complete initial activities toward an eventual upgrade of the AIT fleet to meet next-generation, on-person screening requirements using a wideband upgrade kit and algorithms. This kit will: lower false alarms, require fewer patdowns, increase throughput, and thus, improve the passenger experience. The kit is scheduled to be tested in FY 2023 and FY 2024, and potentially to be ready for deployment in FY 2025.

Quick Personnel Security 201 Scanner

Another technology that TSA completed testing on is the Quick Personnel Security (QPS) 201 Scanner. This flat-panel, millimeter-wave AIT unit allows for an arms-down passenger stance (compared to AITs that require passengers to raise their arms during screening) that may ease the screening process for passengers. It also enables TSOs to review alarm images and to screen passengers simultaneously at alternative locations.

In testing, QPS 201 had a faster processing time and fewer false-alarm rates when compared to

[4] AIT relies upon Automated Target Resolution software to reduce the impact to individual privacy by eliminating the image of each individual's body.
[5] This includes deployment of an AIT operating system update (Windows 10) AIT 2 computer replacement (to ASCU 7 computers), and AIT post-implementation review emulator development and test/deployment.

the baseline, which, in turn, would reduce the need for patdowns of passengers.

Currently, TSA has no plans to procure any additional AITs, to include the QPS 201. TSA is evaluating airport needs continuously and will adjust procurement plans as needed.

C. Enhancing Detection with Computed Tomography

Computed tomography (CT) for screening carry-on items produces high-quality, three-dimensional images that can be rotated 360 degrees by TSOs operating the CTs on three axes for a more thorough visual analysis of a bag's contents. By rotating images, TSOs are better able to analyze carry-on bags for potential threats without having to touch the bag compared to existing two-dimensional screening, which more often results in physical bag searches. CT also can see through clutter in a bag more easily to identify specific potential threat items, resulting in fewer manual bag checks compared to the two-dimensional images produced by the existing advanced technology (AT) X-ray units that CT is replacing.

2021-2022 CT Deployment Strategy

TSA is developing a logistically efficient CT deployment strategy that seeks to enhance security effectiveness and to reduce passenger carry-on item search rates. TSA deployed all 300 of the initial round of CT units that it procured in 2019, and in the first quarter of FY 2022 began deployment of an additional 314 CT units that it procured as part of its comprehensive Checkpoint Property Screening System testing and qualification program.[6]

D. Reducing False-Alarm Rates with AR

TSA is conducting R&D in support of enhancing AR countermeasures that require fewer types of containers to be touched, handled, or opened by TSOs. The R&D is focused initially on advancing handheld and tabletop confirmatory bulk threat detection[7] capabilities. This advanced technology ideally would replace the aging fleet of chemical analysis devices, colorimetric kits, and bottled liquid scanners with a solution that can identify a greater number of benign and threat materials and can scan through more container types with which passengers commonly travel.

The planned R&D aims to promote development of technologies that will resolve quickly and less invasively a greater number of primary screening alarms on benign materials. This improved capability will result in fewer alarms needing to be escalated to transportation security specialists in explosives officers for further handling and ultimate resolution.

[6] Confirmatory technology identifies and analyzes the alarm material with no further procedures or equipment required to verify whether it is benign and the alarm can be cleared or whether it remains a potential threat that must be elevated to advanced AR.
[7] This capability is a matériel approach that analyzes bulk quantities of substances for threats. Analysis is performed either with or without opening the container.

E. Increasing Distance while Conducting Screening

TSA identified several additional technological solutions that will increase social distancing and that will create more sterile environments while maintaining security effectiveness.

Stand-off Detection Technology

Stand-off detection (SOD) is a technology system that allows for noncontact screening of weapons and explosives. SOD was identified as a potential security technology for aviation spaces at security checkpoints, including an ability to protect soft targets. SOD would help to minimize the need to be in close proximity or to have physical contact between TSOs and passengers.

TSA assessed several emerging passive[8] SOD solutions in the aviation environments. SOD solutions can screen individuals quickly, and without physical contact, for items hidden under layers of clothing, which could indicate the presence of an explosive device. There is no X-ray or other penetration of garments and no collection of identifiable information or display of bodily characteristics.

Remote Screening

TSA is exploring ways to support the development and integration of remote screening at the checkpoint. Remote screening entails TSOs conducting the primary carry-on baggage image review function in a location away from the immediate checkpoint area. Remote screening limits exposure of TSOs performing carry-on baggage screening using CT or similar devices by removing a subset of them from the checkpoint floor and by relocating them to a remote viewing room. It also reinforces social distancing practices by reducing the necessary number of TSOs present at the checkpoint because TSOs will be able to screen bags and to review images of carry-on baggage from a remote room. TSA's use of remote screening improves a TSO's capability for image analysis and offers increased staffing flexibility without being limited by the space available at checkpoint lanes.

Off-Lane X-Ray Resolution

Off-lane technology allows for remote AR procedures to occur in a location away from the immediate checkpoint area. Screening carry-on bags remotely with an off-lane screening technology would separate TSOs from passengers to maintain social distances by establishing remote viewing rooms at airports with the requisite technology. To implement this concept, TSA must assess whether this procedure can reduce the number of carry-on bags handled by TSOs, while maintaining security effectiveness. It also would assess if existing remote screening procedures and AR requirements that currently apply to checked baggage also apply to the remote screening of carry-on bags.

[8] Passive imaging detection techniques rely on collecting naturally occurring radiation and on using the contrast between apparently "warmer" and "colder" objects, which usually results from contrasts between the different materials' ability to absorb and radiate energy.

F. Reducing Human Contact with Explosive Vapor Detection

TSA continues to explore alternative solutions to secondary screening that would reduce human contact, such as explosive vapor detection (EVD). EVD-based technology is designed to provide novel AR sampling techniques that allow for trace-level, threat detection capability for on-person, in-baggage, and cargo scenarios. Currently, deployed trace detection techniques require the operator to come into direct contact with passengers or their accessible property, whereas EVD technology functions by assessing the vapor being emitted from the explosive or chemical threat at a defined stand-off distance. The research conducted considers longer range technologies that are 3 to 6 years away from fielding. TSA will assess improvements on current technologies, innovative approaches, and new detectors or components to improve vapor collection efficiency based on dependencies such as explosive substance, physical size, and temperature.

In partnership with S&T, TSA initiated work to support AR through understanding the limits of detection (that is, sensitivity) required for EVD, ultimately resulting in the development of a new EVD standard for on-person, baggage, and break-bulk cargo screening. This work will assess operational needs to detect explosive vapor signatures; to develop EVD requirements and concepts of operation, mature EVD technologies, and test and evaluation tools; and to integrate EVD technologies into the current and future aviation screening architecture.

G. Utilizing Ultraviolet Light for Disinfection

TSA is exploring two types of systems that use ultraviolet (UV-C band (UV-C)) light for disinfection of surfaces within the security checkpoint environment.

UV-C Light Standalone Systems

TSA accelerated the demonstration process for two standalone disinfection systems for bins using ultraviolet light, specifically the dosage of light needed to inactivate COVID-19, as determined by DHS S&T and TSA. The technology is intended to provide a sanitary checkpoint and to prevent both passengers and TSOs from being exposed to harmful viruses and bacteria.

The initial demonstration of UV-C devices from two different manufactures took place in two checkpoints at DCA from March to May 2021. One manufacturer’s device did not meet the dosage requirements determined by DHS S&T and TSA. This unit was recommended for further research before any procurement actions could be determined. The second manufacturer’s device met all minimum dosage requirements. This unit was recommended for “Acquire via Donation Only” and added to TSA’s Acceptable Capability List.

UV-C Light Integrated Systems

TSA is exploring in-line bin systems that could integrate with existing automated screening lanes (ASL). An in-line bin system refers to a bin return system that is incorporated into the existing ASL, automating the process for collecting bins from the recompose area and returning them automatically to the divest station. TSA is evaluating the efficacy of these integrated solutions between three separate UV-C light providers and four ASL vendors across checkpoint AT and CT scanners in the field. To expedite the end-to-end acquisition and deployment process, TSA aims to use these demonstrations to inform subsequent risk assessment and system evaluation activities. Additional considerations include retrofitting the current AT-ASL fleet and upgrading the checkpoint CT-ASL fleet.

H. Exploring Self-Service/Self-Screening Capabilities

Under the DHS S&T Screening-at-Speed Program, TSA co-leads the development of checkpoint technology solutions for self-screening security of TSA PreCheck® passengers.

In late 2021, DHS S&T awarded four contracts for the Screening-at-Speed Program. This effort includes system concept design, prototype design and development, system integration, and subsystem maturation for passenger self-screening solutions. Once a solution is vetted appropriately through testing and evaluation, it will be demonstrated at one of TSA's innovation airports that are located across the United States.

Self-Screening is a network of systems that allows an individual to complete the screening process and to resolve system alarms with minimal outside instruction or oversight. This capability would enable a near self-sufficient one-step passenger screening process, where people and property can be screened together. Currently, two-step screening processes exist at airports where people and property are screened separately. Enabling a one-step self-screening network could support both on-person screening and divestment of personal property (for X-ray screening).

Additionally, passengers directly receive on-person alarm information, which would allow them to self-resolve alarms. As a result, they have decreased contact with TSOs, fewer instances where a patdown or secondary screening would be necessary, and quicker processing through screening checkpoints.

I. Streamlining Acquisition and Procurement Processes

To decrease passenger touchpoints and to enable its ability to combat COVID-19 and other future threats rapidly, TSA restructured its acquisition and procurement processes. The product of this restructuring was five distinct pathways and processes for more efficiently fielding new, mission-critical technology, mostly under emergency conditions.

The **TSA Urgent Solution Intake Process** defined a standardized evaluation process to vet technology solution proposals rapidly that address urgent mission needs, as determined by TSA leadership. The process integrates existing solution intake channels[9] into a uniform evaluation process to reach an outcome decision within 4 weeks.

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[9] Currently, intake channels include a broad agency announcement (BAA), the DHS commercial solutions pilot program, and S&T reports.

TSA Acquisition and Procurement Pathways provided users with baseline criteria to identify the procurement and acquisition processes and outcomes that are most appropriate for efficient implementation of a given solution. Solution owners and relevant stakeholders can reference these pathways to direct the transition from a TSA solution intake channel (for example, BAA, DHS Commercial Solutions Opening Pilot, S&T tech scouting) to an acquisition program or to direct procurement. The criteria for each pathway provide users with a starting point to initiate outreach with appropriate stakeholders to launch a formal acquisition or procurement.

The **TSA 90-Day Procurement Process** defines the steps required to award a contract rapidly to meet mission-critical requirements under emergency conditions and to address health and safety concerns. This process is intended only for critical circumstances as determined by TSA leadership. It requires the prioritization of the procurement and concentration of contracting resources to achieve a 90-day award.

TSA's Capability Acceptance Process is a framework to partner with stakeholders, such as airlines or airport authorities, to donate checkpoint capabilities and screening equipment to TSA. This process is an option for stakeholders who benefit from accelerating capability deployment timelines, from recapitalizing screening equipment, or from enhancing security and the passenger experience. Typical checkpoint technology solutions that may minimize touch or otherwise limit the spread of COVID-19, such as CAT, already are approved for donation.

TSA's ITF has an established BAA process for the aviation security industry to submit proposals on potential security capabilities that support TSA in these efforts. ITF received technology proposals relating to touchless screening, such as crowd movement analytics that ensure social distancing, automated methods to disinfect bins associated with property screening, and remote screening via X-ray technology.

V. Touch-Rate Analysis

TSA conducted a touch-rate analysis to assess the impacts of these changes to the procedural and operational environment for direct and indirect touch between passengers and TSOs.

- **Direct touch** is the average time that a passenger is touched by a TSO performing a patdown to resolve a primary screening alarm.
- **Indirect touch** is the average time that a passenger’s belongings are touched by a TSO and includes the time that a TSO touches the passenger’s items such as an ID, boarding pass, or carry-on baggage.

A. Findings

Preliminary findings for Phase I of the touch-rate analysis focused on impacts to passengers processed through the standard screening process using AT equipment. **Figure 2** shows a comparison of touch with and without COVID-19 mitigations implemented in the screening environment as of February 2021.

Figure 2: Direct Touch vs. Indirect Touch

Touch Category	**No Mitigations** (seconds/passenger)	**COVID-19 Mitigations** (seconds/passenger)	**Change**
Direct Touch	6.4	5.86	-10%
Indirect Touch	68.7	36.20	-48%

B. Analysis Methodology

TSA applied field data and inputs from subject matter experts to construct a detailed screening-data model in accordance with TSA SOPs. The model computed the seconds per passenger of direct (TSO and passenger) and indirect (TSO and property) touch in a two-lane passenger screening checkpoint. To quantify the impact, TSA calculated the total touch time per passenger with and without COVID-19 mitigations, with consideration of the operational environment, to quantify the impacts.

C. Timeline

TSA is conducting the touch-rate analysis in a phased approach and is updating the model projections as additional data is collected, validated, and analyzed. **Figure 3** outlines the timeframe for each activity.

Figure 3: Touch-Rate Analysis Timeframes

Timeframe	Activity
May – June 2020	TSA developed a touch-rate analysis data model and applied discrete event simulation modeling (NetSCO) to estimate the impact of COVID-19 social distancing on screening performance.
Phase I July – September 2020 **Phase II** October – November 2020	TSA conducted two phases of field data collection activities to observe screening under the COVID-19 environment and to gather field data to validate touch rates. • **Phase I:** TSA collected operational data at four locations.[10] The sample size was limited because of passenger volumes and travel limitations. • **Phase II:** TSA collected operational data at seven locations,[11] targeting airports with higher passenger volume.
November – December 2020	TSA incorporated Phase I data results into the COVID-19 touch-rate analysis and assessed the impact of COVID-19 procedure changes at the checkpoints.
January – February 2021	TSA updated the COVID-19 touch-rate analysis with Phase II data results.

[10] DCA, Dulles International Airport, Boston Logan International Airport, and Detroit Metropolitan Airport.
[11] John F. Kennedy International Airport, LaGuardia Airport, Portland International Airport, Los Angeles International Airport, ATL, Tampa International Airport, and MIA.

VI. Conclusion

TSA continues to make significant procedural and technological enhancements at airport checkpoints to enable touchless screening procedures, sanitization measures, enhancements to technologies, and initiatives that limit interactions between passengers and TSO. TSA continues collaboration with stakeholders to implement procedural best practices and to deploy new technology in ways that are efficient and responsive to the current environment while also respecting travelers' privacy, civil rights, and civil liberties. TSA will continue to identify and deploy long-term technology and process solutions to enable a more efficient touchless security environment in the future.

Appendix: Abbreviations

Abbreviation	Definition
1:1	One-to-One
AIT	Advanced Imaging Technology
AR	Alarm Resolution
ASL	Automated Screening Lane
AT	Advanced Technology
ATL	Hartsfield-Jackson Atlanta International Airport
BAA	Broad Agency Announcement
CARES	Coronavirus Aid, Relief, and Economic Security
CAT	Credential Authentication Technology
CAT-2	Credential Authentication Technology - 2
CBP	U.S. Customs and Border Protection
CDC	Centers for Disease Control and Prevention
COVID-19	Coronavirus Disease 2019
CT	Computed Tomography
DCA	Ronald Reagan Washington National Airport
DHS	Department of Homeland Security
EBT	Elevated Body Temperature
EVD	Explosive Vapor Detection
FY	Fiscal Year
ID	Identification Document
ITF	Innovation Task Force
mDL	Mobile Driver’s License
MIA	Miami International Airport
PHX	Phoenix Sky Harbor International Airport
PPE	Personal Protective Equipment
QPS	Quick Personnel Security
R&D	Research and Development
S&T	Science and Technology Directorate
SOD	Stand-Off Detection
SOP	Standard Operating Procedure
TSA	Transportation Security Administration
TSO	Transportation Security Officer
UV-C	Ultraviolet (C Band)