Written Statement

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Introduction

Good morning, Chairman Gimenez, Ranking Member Thanedar, and distinguished Members of the Subcommittee. Thank you for inviting me and my Transportation Security Administration (TSA) colleague, Mr. Mario Wilson, to testify on the role of technology in aviation security. Our testimony will highlight the development of requirements for new checkpoint technologies, acquisition timelines with the associated funding requirements, and how the technology is used in the field to both enhance security effectiveness and improve the passenger experience.

First and foremost, I would like to thank the Committee and Congress for your continued support of our workforce, most notably through approving funding for TSA's pay plan which was included in the FY 2023 Omnibus Appropriations Act. Although today's hearing is focused on technology, it is important to note that sustaining this increase in pay for our entire workforce ensures that those who we need to operate TSA's government funded technology are properly and comparably paid. This is especially important as we have seen record-breaking passenger volume in recent months. This necessary and significant increase in pay that occurred in July upon conversion to the new pay plan brought the salaries of TSA personnel to a level equal to our federal counterparts, and will enable the TSA to recruit, and most importantly retain, top candidates for federal employment. Positive impacts are already being seen. The TSA is committed to providing the very best tools, training, and procedures to our personnel to enable them to efficiently and effectively secure the aviation system.

Second, TSA has seen the benefits of dedicated annual funding for our checked bag systems and are supportive of any legislation that would establish a similar concept for our checkpoint security screening technology. Dedicated funding would enable TSA to complete the deployment of new technologies years, if not decades, ahead of its current deployment timelines of 2042 and 2049. Ending the diversion of the Security Service Fee is critical to TSA's mission. In the aftermath of the terrorist attacks of 9/11, Congress authorized the collection of a fee from commercial flight passengers to offset the costs for civil aviation security services: the Security Service Fee. In 2014, Congress passed legislation to increase the fee to $5.60 per one-way trip with a maximum of $11.20 per round trip. However, the legislation also diverted a large portion of the fees collected away from TSA and to the Treasury General Fund – not for aviation

security. If the diversion of the fee away from TSA is terminated and the fees collected are directed back towards TSA as originally intended, it will provide TSA approximately $1.6 billion annually to offset the agency's appropriated funding. This funding is essential as TSA has seen an unprecedented increase in passenger volume in recent months, which is projected to increase even further in the future.

Passenger volumes have recovered and are exceeding pre-pandemic levels. TSA is screening an average of 2.3 million passengers per day. In FY 2023, TSA screened a total of 838.1 million passengers, a 13.8 percent increase from the prior year; 99.1 percent of passengers waited 30 minutes or less in standard lanes and 98.7 percent of passengers waited 10 minutes or less in TSA PreCheck lanes. This summer, TSA screened 150 million checked bags. In FY 2023, TSA experienced six of the busiest travel days on record, the highest being June 30, 2023 with 2.88 million passengers screened.

Checkpoint Security Screening Technology

Given this staggering volume, it is imperative that TSA develop and deploy the most effective technologies available to promote safe air travel of passengers, checked baggage, and cargo, while ensuring that the system supports a positive and streamlined customer service experience. To do this, TSA uses robust risk analytics to inform the operational requirements for screening equipment, ensuring that investments are made in technologies that provide the most security benefit. These risk analytics are then used to inform research priorities for the agency to ensure research and development (R&D) funding is applied to the most pressing needs.

Recent research efforts include biometric identification technologies, advanced algorithms for explosives and prohibited items (guns, knives, grenades, etc.), detection in carry-on baggage, and advanced on-person screening equipment. Additional critical research is being conducted into what is called Alarm Resolution. Alarm Resolution is the process Transportation Security Officers (TSOs) use to resolve alarms that occur during on-person or luggage screening to quickly determine if the alarm is the result of an actual prohibited item.

TSA coordinates all of these R&D activities with the Department of Homeland Security (DHS) Science and Technology (S&T) Directorate, ensuring no redundancies. TSA also actively

participates in S&T's research portfolio development process to ensure that the Administration's basic research needs are addressed.

What follows is a summary of TSA's major procurement efforts and plans for future technology development and fielding.

Credential Authentication Technology

Credential Authentication Technology (CAT) is one example of the agency's major procurement efforts. From a security perspective, positive identification of passengers is critical to aviation security. In FY 2023, TSA discovered a total of 452 fraudulent IDs at a checkpoint. The CAT is a technology that scans a passenger's identity credential (driver's license, passport, etc.) for security features, displays it on a screen for the TSO to compare it to the passenger's face, and connects to TSA's Secure Flight passenger prescreening system, returning the passenger's screening status (i.e., Standard, TSA PreCheck, or Selectee) in near real time. This enables the officer to more accurately identify the passenger and direct them to the appropriate level of screening, and it negates the need to produce a boarding pass. Currently, a total of 2,054 CAT machines are deployed at 227 locations.

Building on the success of the CAT, TSA is integrating digital identity capabilities, namely the interoperability of state-issued mobile Driver's Licenses, into the second generation CAT system known as the CAT-2. The CAT-2 incorporates biometric matching and digital identity functionality into the CAT unit. The biometric capability on the CAT-2 is a 1:1 facial match where the system compares a live photo of the individual's face with the image on the physical credential. The passenger allows permission for their smart device to transmit their credential information to TSA using the CAT-2 unit, where the CAT-2 performs biometric matching against the digitally provided credential. In September 2023, TSA began retrofitting the existing CAT units with upgrade kits providing CAT-2 functionality, including the ability to interact with digital identities. The TSA will continue to deploy these upgrade kits to existing CAT units throughout FY 2024.

Given the wide diversity of the millions of passengers moving through airport checkpoints daily, accuracy in biometric solutions is a key issue for TSA. Therefore, TSA is grounding its exploration of biometric solutions in rigorous scientific study and analysis to

ensure the full benefits of biometrics technology are realized. We are aware of a variety of public concerns related to performance errors and take this issue seriously. Along with its federal partners, TSA is carefully studying matching performance differences across biometric systems and operational environments to identify the existence of disparities on these and other grounds. TSA works closely with Department of Homeland Security's Science and Technology Directorate and National Institute of Standards and Technology to independently assess the performance of biometrics solutions and found no statistically significant differences in biometric performance across gender, race, and skin tone under varied test conditions for the CAT-2 system. Accuracy in biometric solutions is a priority for TSA, and one that is being carefully studied to ensure TSA realizes the full benefits of this technology and makes informed decisions to mitigate risks.

TSA is also conducting a "1:n" facial identification touchless proof of concept for passengers with a Known Traveler Number (KTN) who are eligible to participate in TSA PreCheck. 1:n is a process that uses the Customs and Border Protection's Traveler Verification Service (TVS); galleries of day-of travelers are built of passengers who have met the requirements and have opted-in to the touchless experience. TSA PreCheck passengers in these locations can step up to the system, have their face photographed, and have their image matched against the day-of gallery in TVS. If there is an identity match, they are allowed to enter the security checkpoint without having to produce any physical or digital forms of ID. Through this innovation, TSA PreCheck passengers now can process through the security checkpoint significantly faster than through the standard CAT-2 protocol. Passengers must take several steps to participate and already have a photo on file for the purpose of travel. Privacy is protected through opt-in consent and deletion of the photo collected at the checkpoint within 24 hours after flight.

If a passenger decides not to opt-in to using biometrics identification, then a normal manual verification process is used. This is addressed in the Privacy Impact Assessment for this touchless proof of concept, and signage is prominently displayed near the 1:n prototype devices.

All of TSA's identity management, facial recognition, and biometric programs are reviewed internally by TSA Privacy and TSA Civil Rights & and Liberties offices, as well as by

the DHS Privacy and DHS Civil Rights and Civil Liberties offices to ensure the protection of privacy, civil rights, and civil liberties of the traveling public.

Lastly, the careful development and deployment of biometric and digital identification capabilities will significantly streamline the passenger identification process while ensuring privacy is enhanced.

Checkpoint Property Screening System and Computed Tomography

Another major technology advancement that TSA is currently procuring is the Checkpoint Property Screening System, or CPSS. At the current rate, TSA will surpass last year's record of 6,542 firearms prevented from getting onboard an aircraft. The CPSS consists of a computed tomography (CT) three-dimensional X-ray scanner. A three-dimensional CT image enables the TSO to rotate the image, scan through items in order to better identify potential threat contents, and virtually remove laptops in the image to assess for signs of tampering. The system is capable of using advanced detection algorithms to detect explosive materials. TSA, in conjunction with the CPSS manufacturers, are currently developing Prohibited Item algorithms to detect weapons such as knives and firearms. There are currently 781 CPSSs installed in the field, and TSA currently has contracts in place with three vendors to deliver additional CT capability. These new CPSSs come in one of three configurations: base, mid-size, and full-size, depending on the size of, and space at, the airport checkpoint.

CAT and CPSS Deployment Timelines

Due to funding constraints, TSA does not have the resources needed to purchase and deploy all of the necessary equipment to airports nationwide. Based on the current funding levels, TSA will not be able to deploy all of the 3,585 CAT machines needed to airports until approximately 2049. Similarly, it will take until approximately 2042 for TSA to be able to deploy all of the 2,263 CPSS machines to airports.

On-Person Screening Technology

TSA is currently in the development phase of the next generation of on-person screening technology. On-person screening technology currently consists of the Walk-Through Metal Detector (WTMD) and the Advanced Imaging Technology (AIT). The WTMD is currently used

predominantly for TSA PreCheck passengers to screen for metallic objects. The AIT is used to screen standard, non-PreCheck passengers for metallic and non-metallic objects. The WTMD is unable to detect non-metallic items, to include explosives, but it provides for expanded passenger throughput for the vetted TSA Trusted Traveler and TSA PreCheck populations. The AIT screens standard, non-PreCheck passengers without physical contact for both metallic and non-metallic threats, including weapons and explosives that may be concealed under a passenger's clothing. Utilization of AIT decreases the need for pat downs for both metallic and non-metallic threats, including weapons and explosives.

In June 2023, TSA concluded deployment of the low probability of false alarm algorithm on AIT units to increase detection capability, decrease false alarm rates, and reduce the need for a pat down by 50 percent. Additionally, High-Definition AIT is currently being tested in the DHS S&T Transportation Security Laboratory in Atlantic City, NJ. If successful, this new technology will both significantly increase security through enhanced threat detection and decrease the false alarm rate even further, which would also help accelerate passenger throughput.

TSA is also evaluating screening technologies to replace the WTMD. These technologies show promise in detection of both metallic and non-metallic items when passengers pause, or walk through, the equipment at a slow speed.

Advanced Alarm Resolution Capabilities

The TSA is also currently conducting extensive research into advanced Alarm Resolution (AR) capabilities. The AR program will replace older and limited resolution systems (e.g., the current Bottle Liquid Scanners) with next generation solutions such as Bulk Resolution Technology that will positively identify a significantly increased number of threat materials concealed in containers.

Checked Baggage Capabilities

The TSA is also investigating the next generation of checked baggage (CB) screening systems. TSA has developed a CB roadmap outlining the needed capability enhancements and technology upgrades over the next several years. The roadmap defines the TSA's current state and future vision for CB capability and is designed to guide investments into the long-term

research, innovation development, and acquisition strategy. The TSA must seek technology aimed at closing the capability gaps in today's CB screening systems. Through dedicated research and innovation, the agency will introduce new technologies with the ability to detect an expanded set of threat materials, lower false-alarm rates, and lower lifecycle costs. Ideally, all future capabilities will reduce the cognitive burden on the TSOs and improve their operator experience and detection ability, which will ultimately improve the passenger experience. Historically, some airports lacked the infrastructure to accommodate the large and heavy Explosive Detection System (EDS) machines. Those airports were required to rely solely on the use of Explosive Trace Detection (ETD) to screen passengers and their luggage. To improve CB security effectiveness, the TSA is transitioning from ETD-only to EDS at locations that are now capable of supporting EDS. Additionally, TSA recently tested Dual Use Computed Tomography (DUCT) in some airports, which utilizes one piece of screening equipment to screen both carry-on and checked baggage. Early results show that the use of DUCT systems would significantly increase security effectiveness. DUCT systems could be deployed at low volume airports that currently rely on ETD physical search.

Cargo Capabilities

TSA is also responsible for the oversight of the screening of cargo. TSA established the Certified Cargo Screening Program in 2009 under which it certifies cargo screening facilities in the United States in order to meet the mandates of the 9/11 Act to screen 100 percent of cargo transported on passenger aircraft. The TSA requires Certified Cargo Screening Facilities (CCSF) or their authorized representatives to use TSA-approved methods which include diverse methods of screening such as X-ray systems, EDS, ETD, explosives detection canine teams certified by TSA, or a physical search together with manifest verification. The range of air cargo commodity types is extraordinarily wide, and this poses challenges to developing appropriate screening systems. TSA is aggressively pursuing next generation solutions including systems that combine X-ray, ETD, or EDS enabling technologies to not only rely on images but leverage the ability to detect trace components; large aperture systems that enable screening an entire pallet at one time; fast parcel systems to increase throughput; and automated alarm software that is currently being developed in partnership with DHS S&T to mitigate complete reliance on screeners.

Open Architecture

The technologies discussed above, and any future acquisitions, will be grounded in Open Architecture (OA). OA is a design approach where components such as software and hardware are standards-based and interoperable to allow any vendor to create improved subcomponents such as new detection algorithms, enhancements to user interfaces, and reporting systems to support improved business intelligence. Ultimately, these components come together to create a superior combined system.

Leveraging OA will improve TSA's ability to rapidly respond to emerging threats and work with all of industry to address capability needs. OA strengthens TSA's ability to stay ahead of ever-evolving threats through greater agility and flexibility in the acquisition of innovative, interconnected and advanced transportation security technologies. It will define an improved approach to delivering enhanced capabilities to the field in a timely manner, providing the workforce access to the most effective security technology while simplifying the processes and procedures used to help keep the nation secure. TSA published the Open Architecture Roadmap in July 2023 and is actively working to operationalize key OA concepts in FY 2024.

Passenger Experience

As TSA develops and deploys new checkpoint security screening technology and procedures, the agency's primary focus is on strengthening aviation security while enhancing the passenger experience. CAT enables TSOs to validate a traveler's reservation without having to request a boarding pass thus reducing documentation requirements for the traveling public to access our security checkpoints. The deployment of CT three-dimensional X-ray machines will reduce the need for passengers to remove items from their bags, greatly improving throughput at the checkpoint. The development of advanced detection algorithms will enable TSOs to focus on potential threats that are automatically identified, both improving security and increasing efficiencies. New on-person screening capabilities will further reduce the need for pat-downs, significantly improving the passenger experience.

Any investments in technology to improve security enhancements must be placed in the hands of a talented and well-trained workforce. The TSA is committed to providing the very best

tools, training, and procedures to our personnel to enable them to efficiently and effectively secure the aviation system.

Conclusion

To carry out its aviation security mission, TSA needs dedicated, predictable, and robust funding to continue to develop and deploy next-generation checkpoint security screening technology and procedures. TSA is actively pursuing these technologies in partnership with multiple vendors, including small businesses. The single biggest limiting factor is that TSA is inadequately funded to fully implement checkpoint technology acceleration plans to address known and evolving threats. As passenger throughput continues to increase, TSA must have the tools and technology necessary to ensure the safety and freedom of movement of people and commerce.

Chairman Gimenez, Ranking Member Thanedar, and members of the Subcommittee, thank you for the opportunity to appear before you today on the role technology plays in aviation security. My colleague and I look forward to your questions.