

### CHALLENGE: AIR SECURITY IN A CHANGING WORLD

The Department of Homeland Security (DHS) Transportation Security Authority (TSA) screens 750 million passengers and 850 million checked bags every year and the numbers continue to rise. Air cargo is carried on nearly all commercial flights, makes up 35 percent of global trade, and is mandated to be 100 percent screened, while security threats continue to evolve and become more difficult to detect. All these factors create a complicated and massive screening requirement to protect people and infrastructure. Current security systems will not be capable of screening at the speed, capacity, and detail needed to stay ahead of emerging threats and keep pace with the speed and growth of travel and commerce.

### INVESTING IN THE FUTURE OF SCREENING

The DHS Science & Technology Directorate (S&T) Baggage, Cargo, People Screening Program is at the forefront of screening, detection, and mitigation research and development, to detect explosives and prohibited items at airports and in air cargo. The program invests in solutions for these complicated requirements through a subset of programs covering four focus areas: Air Cargo, Checked Baggage, Next Generation Explosives Trace Detection, and Screening at Speed (which pursues next generation passenger and carry-on screening). All four work together with government, industry, and academic partners to develop new processes, technologies, and training to keep up with changing detection and security requirements.

### SOLUTIONS THAT BENEFIT EVERYONE

This Program uses a system-of-systems approach with open architectures and layered aviation security assets from curb to gate, which reduces security risks, facilitates rapid system upgrades, improves responsiveness to evolving threats, and lowers security costs. Solutions created by these programs also improve detection of explosives and prohibited items and reduce false alarms. That means fewer secondary inspections of checked and carry-on bags, fewer passenger pat downs, less divestment of personal items, and reduced need to unload air cargo pallets. Improvements in air security can also be applied elsewhere, such as along borders and at large-scale national security events.



### RECENT ACCOMPLISHMENTS

- Commercialized the High Definition-Advanced Imaging Tomography (HD-AIT) and Shoe Scanner systems;
- Demonstrated a third-party automatic threat recognition (ATR) algorithm to implement machine-learning and artificial intelligence in screening;
- Developed Explosives Trace Detection (ETD) Quality Control kits, conducted a field-testing event, and validated detection performance of deployed ETDs; and
- Successfully tested the Opacity and Complexity Assessment Software Tool (OCAST) threat-screening software for air cargo at Seattle-Tacoma International Airport.

### UPCOMING MILESTONES

- Demonstrate a real-time AIT system capable of scanning passengers at a walking pace;
- Pilot an X-ray diffraction alarm resolution system at an airport in partnership with TSA's Innovation Task Force;
- Complete certification of the Explosives Vapor Testbed;
- Transition OCAST software to TSA for deployment;
- Operational assessment of cargo skid scanner prototypes at three U.S. airports (Los Angeles International, Logan International, and Dulles International); and
- Demonstration of third-party ATR for the Checked Baggage Technology Development Project.