DHS Science and Technology Directorate
Checked Baggage Program

Checked baggage and the evolving threat

Explosives continue to be a growing threat to aviation and the Homeland Security Enterprise. Explosives can be hidden in checked baggage aboard aircraft in various items such as toys, computers, food, drinks, shoes, and even flashlights and medical devices. The Department of Homeland Security Science and Technology Directorate (S&T) is working on automated high-speed, high-performance checked baggage explosives detection systems (EDS) with improved material discrimination/identification, improved throughput and reduced operations and maintenance costs for acquisition by the Transportation Security Administration (TSA).

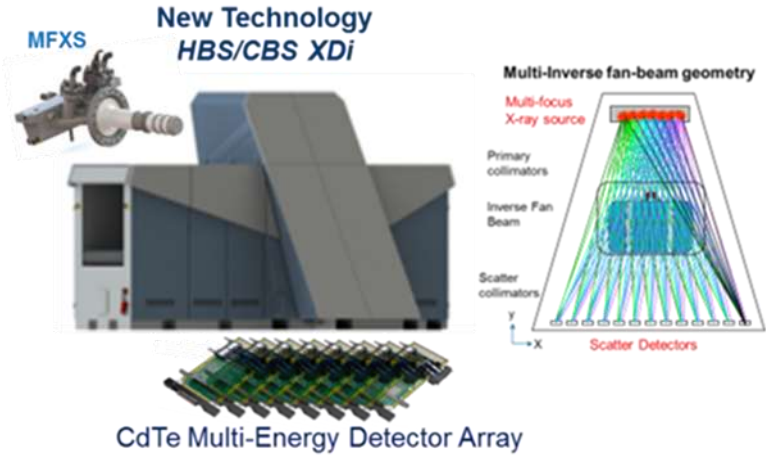
S&T is also assisting TSA in the development of performance requirements and standards as well as core technologies for next generation EDS. This process progressively upgrades the ability to detect explosives in all situations, including the ever-evolving threat of homemade explosives.

The commercial development of these next generation systems will substantially improve the performance and affordability of checked baggage screening. Some S&T Checked Baggage Program successes are described below.

Checked Baggage Screening System

S&T delivers advanced algorithms for improved detection and testing

Funded by S&T, new, advanced algorithms have been developed by both vendors from academia and current X-ray industry. These algorithms have made improvements to previously developed approaches such as risk based screening, as well as novel methodologies such as kernel-based analysis and dictionary learning. Using both novel approaches and improving on current approaches, there is great potential for significant increases in the probability of detection, and reductions in the probability of false alarms. Vendors from industry and academia have also created experimental test beds, which will serve to improve material recognition and identify specific threats. Improved material discrimination increases the ability to detect difficult threats, and to differentiate between threat and not threat materials.



Newly developed technology HBS/CBS XDi multi-energy detector array

S&T Customers/Partners

TSA is the primary customer for the Checked Baggage Program. S&T continually coordinates with the Transportation Security Laboratory (TSL) and their partners in support of the program.