# Technology meets the need for speed

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A new generation of screening systems allows passengers to be scanned 'on the fly'.
Kylie Bielby and *Barry Cross* report

The rapid growth of the aviation security industry over the past 20 years has fuelled – and been driven by – the constant search for next-generation technologies and capabilities that screen passengers quickly and efficiently.

Historically, in response to terrorist attacks, the aviation security industry has worked with regulators and airports to develop and bring to market many of the solutions and procedures that passengers see today.
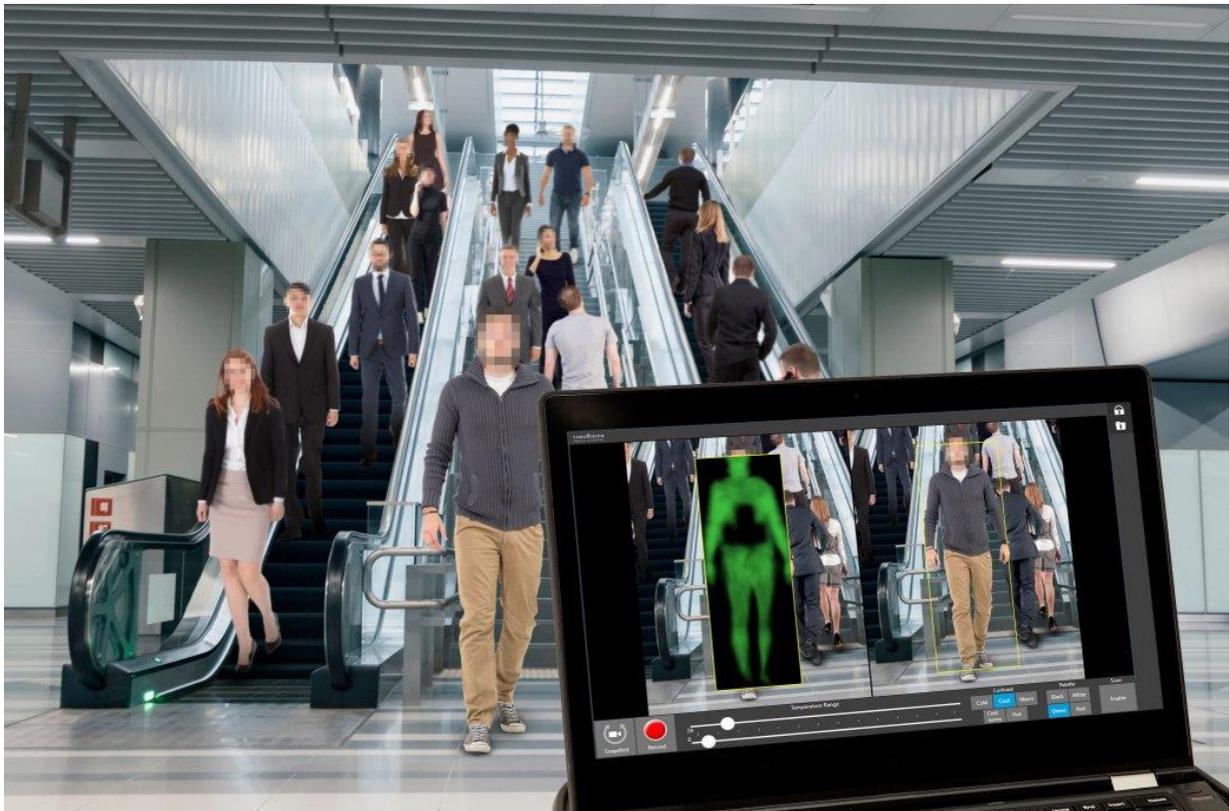
New-generation technology screens passengers on the move for explosives and other threat items. (ThruVision)

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The bombing of Pan Am Flight 103 in 1988 ushered in the era of 100% hold baggage screening, and the 2001 attempt by shoe bomber Richard Reid to bring down American Airlines Flight 63 set off a requirement for passengers to remove their shoes, although research and development (R&D) continues into technology to detect threat items in

footwear. The unsuccessful attempt by underwear bomber Umar Abdulmutallab in 2009 to detonate plastic explosives in his clothing on a flight from Amsterdam to Detroit acted as a catalyst for the development of body scanners, which are now in place at hub airports worldwide.

More recent attacks and emerging threats continue to redefine how the air transport industry maintains a secure flow of passengers and goods. At the same time, the burgeoning capabilities of artificial intelligence (AI) are being integrated into surveillance, screening, cybersecurity, access control, and perimeter security. According to a market report from BCC Research in January, the global market for AI technologies in airport security will grow at an average annual rate of 9.7% by the end of 2023, reaching USD281.8 million.

Public areas

In the 2010s, airports in Belgium, Pakistan, Russia, Turkey, and the US have suffered mass casualty attacks in public areas of the airport (pre-checkpoint for departures or in the arrivals hall). Security in these areas is often unregulated; in the US, for example, Transportation Security Administration (TSA) responsibilities start at the checkpoint so other agencies (municipal authorities or airport operators) must deal with security in public areas.

Keeping public areas safe is a growing priority for US airport authorities, according to Chris Bidwell, senior vice-president of security issues at Airports Council International - North America (ACI-NA). "Our members train on and use a layered approach that includes CCTV, licence plate readers, plain-clothes officers, and visual assessments," he noted. "Each airport is required to have individual plans and response protocols in place."

The TSA has funded checkpoint and hold baggage screening technology and operations since the agency was established in 2001 after the 9/11 attacks, but public area security funding only came into the spotlight recently. The TSA Modernization Act of 2018 included a Law Enforcement Officer Reimbursement Program to help local municipalities offset the cost of providing personnel for public area security. "Ensuring continued funding of this programme is essential to long-term public area airport security," said Bidwell.

In addition to law enforcement officer reimbursement, Bidwell cited the TSA Innovation Task Force as essential to enhancing public area security. "Long lines at passenger checkpoints are more vulnerable to attack," he explained. "It is important that TSA has the appropriate funding and all responsible parties – including local governments and Congress – work together to achieve this."

Collaboration, explained Bidwell, is essential in dealing with the diverse range of security threats to aviation. These include intrusions by unauthorised or maliciously operated unmanned aerial vehicles, as shown by the temporary closure of Gatwick Airport in December 2018. "Currently, US airports don't have the authority to deploy drone mitigation and detection technology," Bidwell said. "ACI-NA is working with TSA on a concept of operations [CONOPS] and with the FAA to determine responsibilities and evaluate what technologies can be used."

Scanning on the move

At the checkpoint, recent deployments and industry R&D have primarily focused on modifying existing technologies to screen people and baggage quicker, more accurately, and less intrusively. After successfully screening hold baggage in the US and a growing number of countries for nearly 20 years, computed tomography technology is making inroads at the checkpoint. It will be widely deployed in the US to screen carry-on bags after the TSA committed to purchasing 300 systems over the next five years.

Body scanners have had a more chequered history: the 2009 underwear bombing triggered an initial rush to deploy the technology at airport checkpoints, especially in the US, but this led to various concerns over privacy, efficiency, and throughput speed. Body scanner manufacturers refined their designs with systems that identify potential concealed threats without violating privacy. These new-generation scanners also operate on a smaller footprint, with an increased throughput and lower staffing requirements.

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