New technology breakthroughs for enhancing Airport Security in increasingly complex threat environment

Commercial aviation plays a central role in our daily lives and is an essential part of the national economy. Total global air travel demand increased 5.9 percent year over year in 2014, and capacity increased 5.6 percent, according to the International Air Transport Association. The number of passengers are predicted to rise from 3.4 billion passengers in 2014 to 6.7 billion in 2032 to 16 billion in 2050. More than 100,000 flights take off and land every day across the world.

Commercial aviation has also been an alluring target for terrorists for decades now. On the morning of 22 March 2016, three coordinated suicide bombings occurred in Belgium: two at Brussels Airport in Zaventem, and one at Maalbeek metro station in central Brussels killing at least 30 people and wounding 230 others. The perpetrators belonged to a terrorist cell which had been involved in the November 2015 Paris attacks. Local mayor Francis Vermeiren confirmed the ISIS suspects checked in their explosives-packed suitcases just seconds before the atrocities. He said: ‘They came in a taxi with their suitcases, their bombs were in their bags. ‘They put their suitcases on trolleys, the first two bombs exploded. The third also put his on a trolley but he must have panicked, it didn’t explode.’ Another series of bombs and shootings inside Istanbul’s Ataturk airport killed dozens; and most recently in Fort Lauderdale, a gunman killing five before surrendering to police.
Terrorists have been using innovative new technologies and tactics like smuggling modular explosive devices onto planes, camouflaging explosives in everyday items and hiding them inside suicide operatives’ bodies, and carrying 9/11-style attacks. In 2006, there was a major plot to blow up several trans-Atlantic flights using explosives concealed in drinks bottles. Further attempts included a bomb hidden in a terrorist’s underwear in 2009, and the printer cartridge bomb in 2010. Even airport terminals and associated facilities such as car parks have come under terrorist attacks. As threat is evolving continuously the security measures also must adapt continuously to reduce the risks.

“Passenger numbers are expected to double in 20 years, putting airport security facilities under immense pressure,” said Ken Wood, Sales and Marketing Director of Sequestim Ltd, a joint venture between Cardiff University and QMC Instruments Ltd.

Commercial aviation has been an alluring target for terrorists for decades now.

Brian Michael Jenkins, senior adviser to the president of research organization RAND Corp on an interview to Aaron Hutchins suggested several reasons: Operations: “These are assemblies of people, crowds in confined environments and easy to access. It makes them an ideal killing field. For those who are concerned about carrying out bombings, the fact that people arrive with large suitcases enables someone to walk in with a large bag carrying an explosive device and it attracts no suspicion.” Prestige and attention: “All other things being equal, such as number of casualties, terrorist events at airports get more national and international attention than terrorist attacks at other venues—unless they are [dramatic] like the truck plowing into people in Nice.” Scare away tourists, ruin country’s economy: “Tourism in Turkey has plummeted. For countries where tourism represents a significant contribution to the GDP, like Egypt or Tunisia, airplane and hotel attacks can devastate the economy. It’s pretty effective in terms of economic warfare. Psychological effects: “It touches a nerve with people’s psychological reactions more than other [attacks] ... People are talking about the need to protect airports—not just airplanes—and create
security perimeters at the front doors of the airport, not at the corridors of the doors leading to the planes. We’ll move to a situation where people see armed guards and automatic weapons. On one hand, that may be reassuring, but on the other hand it’s a reminder that nothing is safe.”

**Airport Security**

The high concentration of people on large airliners can result in high death rate with attacks on aircraft. This sheer number of passengers that must be screened and number of aircraft that must be secured also makes security a very difficult task. James Somerville-Smith, EMEA Channel Marketing Leader at Honeywell Security & Fire, agrees that the primary challenge for security professionals with regards to today’s rapidly expanding airports is the level of congestion: “Airports are some of the world’s busiest spaces, which can be difficult to monitor effectively.”

Another hurdle for those securing airports, reckons Somerville-Smith, is that most never stop their operations: “Their security systems must perform day or night throughout the year. Continuing to operate without interruption is essential to providing a good service to airlines and passengers, even in the event of an unexpected power failure. The answer is installing integrated security systems, with automatic fail-over to back-up systems.

Airport security that refers to the techniques and methods used in protecting passengers, staff and aircraft from accidental/malicious harm, crime and other threats, is also evolving to meet the growing threats. The cost of security is also prohibitive. “The underwear bomber’s device failed. His total investment was probably $5,000. And yet, in response, the United States spent close to a billion dollars deploying
full-body scanners.” “One attack on one airport in the United States obliges the authorities to increase security at 450 commercial airports. In other words, it’s not the magnitude [of the attack] that drives the diversion of resources to security, but rather the volume and magnitude of targets to be protected,”

In a 2004 study, RAND presented near-term options for improving security at Los Angeles International Airport based upon one fact that consistently emerged from the analysis: it is not the size of the bomb that matters most; it is where it is detonated. All of the most dangerous terrorist attacks involve placement of a bomb in close proximity to a vulnerable crowd of people. The authors proposed two valid ways to reduce this vulnerability: Move the possible bomb detonation away from the people or move the people away from the possible bomb detonation. The study also identified an easy way to make people a less attractive target – improve ticketing and security operations so that crowds of people aren’t waiting in line, as reported by Henry H. Willis and Michael A. Brown.

The authors also gave example of two emerging technologies – smart vehicles and smart infrastructure – that may offer innovative solutions to introduce some useful unpredictability that would improve security by moving high volumes of people and traffic out of line. Smart infrastructure can detect when congestion is occurring. Connected vehicles can use this information to help reroute traffic around congested areas or streamline the flow through congestion.
Airport Security Technologies

The system of tracking terrorists’ movements has been introduced at the airports of 13 countries and will soon come into operation in 20 more states, UN Under-Secretary-General, Head of the UN Counter-Terrorism Office Vladimir Voronkov told TASS. He cited example, “The program of countering foreign militants – terrorists by way of strengthening air security,” which envisages getting preliminary information about passengers. The diplomat mentioned among the other programs, which the UN Counter-Terrorism Office was implementing or planning “the support of terrorism victims, the prevention of violent extremism and the efforts to counter the financing of terrorism, including arms deliveries, and also counter-terror sports.”

The United Nations Security Council has unanimously adopted its first resolution to address the growing terrorist threats to the civil aviation community. The resolution, known as 2309 (2016), has asked all nations to improve screening and use new technologies to identify explosives and other threats in airports. It also called on the countries to share information about possible threats and enhance international and regional cooperation to counter extremist threats.

A large number of airports utilize stringent screening and access management technology but do not take adequate measures to separate the public area from the Air Operations Area (AOA), making it easier for terrorists and unauthorized personnel to access a parked aircraft. Airport security market vendors offer technologies such as light and motion sensors, surveillance and thermal cameras, and video analytics systems
that can enable airport authorities to enforce security protocols and deter outsiders from hijacking airplanes and stealing cargo.

**Video Surveillance**

High-performance video surveillance is a key component of a comprehensive airport security system. The video content is analysed to find dangerous items, irregular activities and garner intelligence on passengers. Video Cameras are complemented with thermal cameras to reduce false alarms.

A next important step is perimeter security that utilizes license-plate readers upon entering an airport or transportation hub, or when you enter a parking garage. Perimeter intrusion detection systems (PIDS) are multi-faceted systems that can employ radar, video motion detection, infrared cameras, and fence sensors, among other things. The perimeter part of the layered defense includes hundreds or even thousands of cameras needed for effective airport surveillance with facial recognition software to monitor known terrorists and suspicious activities. It includes a whole range of smart functions to analyse video footage in real time or offline, including analytics for video tracking.

Big data technologies Integrated with cloud computing resources can be used to detect anomalies (unattended baggage, a passenger in a restricted area, crowd formation, etc.), estimates and predicts wait times and spots suspicious behaviour patterns anywhere in the airport.
Recognizing dangerous behaviors with predictive analytics and machine learning complement current security measures and promotes better flying conditions. The theory behind behavior recognition is based on the theory that when someone is in the process of carrying out a criminal or terrorist act, that person exhibits behavior that is out of the norm.

According to datanami.com, this type of behavior is often a tip-off that something is wrong, and can be split into two categories. This may include micro behavior like facial expressions, perspiration, lack of eye contact. Macro behavior is broader movement throughout the space, such as attempting to hide his or her face by turning away when someone approaches or trying to stay out of sight. By using predictive analytics, security operation managers can monitor both access and behavior of internal employees and contractors, identifying dangerous insiders and halting an attack before it happens.

**S&T’s Immersive Imaging System’s High-Resolution Images & 360-degree Coverage, Provides Full Scene Situational Awareness**

Airports are flooded with people and cargo around the clock. For security practitioners, it could seem impossible to catch everything that happens in such a wide open, but extremely crowded space. Stadiums and other large, public venues require near-perfect surveillance systems to do so.

Funded by S&T and developed at the Massachusetts Institute of Technology Lincoln Laboratory (MIT/LL), Immersive Imaging System (IIS) could provide security practitioners with vastly
greater imagery than any prior camera system, collecting visual data that is both clear and comprehensive. Offering high-resolution images and 360-degree coverage, the system provides full scene situational awareness of areas of interest with rapid forensic capabilities and real-time actionable data analytics.

360-degree view will help maximize visibility for a curb-to-gate solution in airports. A 180 degree version of IIS is currently being demonstrated at Seattle’s CenturyLink Field under a project with Pacific Northwest National Laboratory (PNNL). The award winning IIS technology has been licensed to Consolidated Resource Imaging, LLC (CRI). The IIS systems can be custom configured to provide a 90 to 360 degree area of coverage, depending on the installation location.

Many cameras today are pan-tilt-zoom and must be pointed directly at areas of interest, forcing operators to choose either a high-resolution view of a small area or a low-resolution, larger area view. The 360-degree cameras currently available are mostly low-resolution and only inform other pan-tilt cameras where to look.

IIS transforms typical 360-degree situational awareness by delivering a resolution sufficient to identify even the smallest details at distances up to 100 meters in all directions simultaneously, adding a new layer of safety to high-impact locations. Using up to 50 individual, high-resolution cameras and lenses, the system stitches the many perspectives into a single, continuous image. The system’s graphical user interface incorporates viewer software with detection and video processing algorithms, delivering a constant, all-encompassing feed, Fortune explained.S&T’s
Immersive Imaging System provides a small presence but big impact with its expansive 180-degree field of view.

It also allows multiple operators at once to scan and zoom across the whole 360-degree span digitally, selecting areas to designate for automated alerts as well as play back archived footage to review critical events. Full-resolution footage can be stored and retrieved from the camera for up to 30 days, and image compression allows for efficient capture of data. One challenge, of course, is managing the volume of data collected from such a powerful system over long time periods. However, the Immersive Imaging System’s storage solution enables extremely high data rates, which further supports real-time surveillance.

This high resolution camera array provides first responders and critical infrastructure owners with increased capability to identify threats and analyze incidents with better quality analytics as compared to today’s standard CCTV systems, explained Jim Grove, S&T Portfolio Manager to FLETC. The goal of the pilot is to provide requirements for analytical software and development of a mobile version of the system, which could be used at crowded areas and high-risk events.

Cyber threats and Cyber Security

The security of commercial airlines and whether the systems crucial to fly planes are vulnerable to cyber-attacks hit the headlines recently after a security researcher claimed that he had been able to hack into flight controls via his underseat entertainment unit. Airport databases are hubs for client information such as financial and personal data. The increasing reliance on the internet for operations such as
data storage, tracking of cargo in real-time, and others can subject this information to security breaches and data theft.

“Cyber security means analyzing the risk systematically and with a calm head, anticipating the threats and addressing the main vulnerabilities, supporting industry with the actions it needs to take, and taking the right actions as regulators to help protect industry and passengers when we need to,” says Lord Ahmad of Wimbledon, Department for Transport.

The high installation and maintenance costs of the solutions is hindering the growth of the airport security market. The technology must be upgraded at frequent intervals of time as hacking software are continuously evolving at a rapid rate. For instance, the Petya ransomware, working similar to WannaCry, is disrupting the operations of airports and large companies in Russia and Ukraine causing the normal operations to be halted.

Screening Technologies

New screening technology and new approaches to find concealed explosives are required. New techniques are required which will not only offer better detection, but will also help speed passenger throughput and reduce industry costs. They should also cause minimum inconvenience to the passengers in terms of shortening waiting times and allowing for faster processing through the checkpoint, whilst maintaining the highest levels of security. “What’s clear is that as terrorists continue to innovate, our protective measures have to stay on their coat tails, and where possible get ahead.”
Full-body scanners

Travelers are screened by metal detectors to detect either weapons or items that could be used as weapons on board aircraft so that they could hijack the plane. There are two types of these scanners currently in use: backscatter scanners that use X-rays and ‘millimetre wave’ machines that use non-ionising radio waves to produce a three-dimensional image.

Backscatter X-rays devices use Compton scattering to detect hidden weapons and explosives on passengers. They, require that the passenger stand close to a flat panel and produce a high resolution image but they depict the passengers in a state of undress that some find embarrassing.

Millimeter wave machines running privacy software, generates a cartoon-line body image that identifies the location of a potentially suspicious element, instead of an all-too-revealing picture.

Explosive detection machines used include X-ray machines and explosives trace-detection portal machines. Explosive detection machines can also be used for both carry on and checked baggage. These detect volatile compounds given off from explosives using gas chromatography.

CT Scanning

Another possible solutions for the next generation of airport security screening is computed tomography (CT) scanning – a similar technology to what is used for scans in hospitals. The concept: shoot 3D images of ever passenger item, the same way a CT scan swirls around the body to offer detailed imaging. By sampling each passenger item in 360°, security forces are able to better assess any potential threats, or hidden layers.
“The conventional equipment simply doesn’t collect as much data as CT equipment. So a spinning source in a relatively similar amount of time will collect much more data about what it’s looking at compared to a conventional X-ray, which may have just one, two or three cameras that are taking a photo. So when you have more data about what it is you’re looking at, in this case bags, you’re simply able to do more things with that data in the same amount of time.”

Analogic’s Director of Global Sales and Service, Jonathan Stone, described to FTE the key benefits of CT technology: “The benefit of this product, and with CT technology in general, is that passengers can keep laptops and liquids in the bag when they reach the checkpoint. The equipment maintains or exceeds the detection capability of the existing equipment at checkpoints while keeping those items in the bag, so it’s a double benefit.”

New passenger scanner uses Passive Millimeter wave and Terahertz technology to speed up airport security

A team of engineers at the University of Delaware has built and demonstrated a real-time mobile video camera that sees the environment through radio frequency (RF) waves as opposed to optical or infrared (IR) waves. In early demonstrations, the device has shown that using high-frequency waves enables it to ‘see’ through non-metallic objects and detect concealed objects. In December 2018, the university announced the team received USD1.5 million in funding from the US Department of Defense (DoD) to reduce the size, weight, and power (SWaP) of the device in preparation for a live trial in May.
The ability to make the device smaller is important, Dennis Prather, endowed professor of electrical engineering at the University of Delaware, told Jane’s. Typical imaging systems scale in three dimensions (3D) – they have a lens and have to be a certain distance from the focal plane. In an IR camera, or any kind of visible-light camera, the lens focuses the image onto film, or an electronic focal plane array, so they scale in 3D, Prather explained. “If I want to make a bigger lens, I have to make it deeper too, which means they scale volumetrically. If you can do it in a phased array like we do, it only scales in 2D, so it has a ‘pizza box’ scale factor as opposed to a moving box-scale factor,” he said.

That means Prather and the team can make a system that more closely resembles a flat-panel television (TV) set. “It will still be big in area because that is proportional to the wave length. You really can’t compromise that,” he added. “You can now imagine having an imager that is a RF video camera hanging on the walls much like a flat panel TV. That is the breakthrough we have been able to develop,” he said. Prather noted the team from the University of Delaware may be the only group in the world that has ever built a video camera that works in those frequencies from a phased array antenna system.

A super-sensitive passenger scanner that reveals hidden security threats is being trialled at Cardiff Airport in the UK. The walk-through scanner, which uses space technology to image human body heat, is the result of a collaboration between Sequestim Ltd. and Cardiff University scientists.

“Our scanner combines a number of world-leading technologies developed by our team here in the UK. It uses the human body as a source of “light”, in contrast with existing scanners
which process reflected and scattered millimetre-waves while
the passenger is required to strike a pose.” “Our system only
needs a few seconds to do its work. Passengers walking
normally through security would no longer need to take off
clothes and jackets, or remove personal items such as
phones. Originally built to study the furthest reaches of the
universe, the technology used is so sensitive it could see a
100W light bulb at a distance of 500,000 miles (twice the
distance to the Moon.)

The scanner quickly “learns” the difference between items that
can and cannot be taken onto an aircraft, reducing the risk of
false alarms which inconvenience passengers and slow down
screening. “The detector technology was originally developed
to study the most distant astronomical phenomena. For example,
we study how stars are born from gigantic clouds of gas and
dust,” explained Mr Wood. “It detects millimetre-waves, which
are just like visible light but at a wavelength more than one
thousand times longer. The ability of the scanner to reveal
hidden objects has also attracted interest from Border Force,
responsible for the UK’s frontline border control operations
at air, sea and rail ports.

Any concealed items show up very clearly as a shadow because
the human body, by dint of its heat, acts like a light bulb
for our scanner. The new scanner images do not present any
ethical issues because anatomical details do not show up. No-
one will need to see the images when the technology is
eventually used for real, however, because the system will be
completely automatic. The airport trial aims to prove that
passive terahertz imaging is robust, versatile, fast and
convenient.
Real-Time, Hand-Held Scanner to Revolutionize Airport Security

A real-time, hand-held chemical scanner with stand-off detection capabilities has been unveiled by a team of researchers and engineers from nine European countries.

The device can scan from a distance of up to 100 feet (30 m) and is capable of instantaneous, real-time, unambiguous detection. With real-time scanning delivering a realistic detection rate of one every few seconds, and therefore a rate of 1,200 per hour, the new device can deliver over 6 times more capability than state-of-the-art trace portal scanners that detect bombs and illegal drugs at a rate of 180 of passengers per hour.

“We are making the next generation of sensors that are compact, low cost and low on power consumption and capable real-time detection where the speed and sensibility is unrivaled,” said MIRPHAB coordinator Sergio Nicoletti, from CEA-Leti, France.

“Spectroscopic sensing in the Mid-IR wavelength band (3 to 12 μm) is a powerful analytical tool to address societal challenges like climate change or monitoring emission controls,” said Jose Pozo, Director of Technology and Innovation at the European Photonics Industry Consortium (EPIC).

“In this wavelength band, the so-called ‘fingerprint region,’ chemicals exhibit intense adsorption features allowing superior detection capabilities and unambiguous identification.” The device could be installed on the front of airports, scanning crowds for suspicious material, like explosives or illegal drugs, before they even enter the building.

https://www.youtube.com/watch?v=Yogw8LkwPOY
Explosive scanner from the Loughborough University

Professor Tyrer, from the University’s Wolfson School of Mechanical, Electrical and Manufacturing Engineering, have developed an automated real time technique that can identify tiny amounts of explosive particles invisible to the naked eye. Using complex laser technology, it can remotely scan vehicles, cargo and crowded areas, such as airports, train stations and sports stadiums, automatically alerting an operator if it detects traces of explosives and accurately pinpointing its location.

The system is non-invasive, works in real time and causes no delays to the public or businesses. It is fully automated, ruling out human error, and the images produced are no more controversial than those generated by CCTV. “When you handle an explosive, the chemicals and various constituent components present, leave traces on your fingers and clothes, and are transmitted to anything you touch. Using some of the laser technology that we have invented here at Loughborough over the past few years, we have been able to create a device that can see the explosives and reject all other materials.”

“Sadly it seems inevitable now that we are going to see more and more terrorist attacks like those we recently witnessed in Brussels,” says Professor Tyrer. “And had our device been in operation at Brussels Airport I firmly believe those terrorists would have been identified and prevented from entering the terminal

ExDtect will soon be used to scan cargo for an international
courier, and discussions are taking place with several other international organisations which are also keen to use the technology.

**DHS S&T awards $200K to Quanergy Systems for LiDAR technology**

The Department of Homeland Security (DHS) Science and Technology Directorate’s (S&T) awarded $200,000 to Quanergy Systems, Inc, a Sunnyvale, California-based start-up, to develop LiDAR-based technology to enhance Customs and Border Protection’s (CBP) counting and measuring capabilities in airport security and customs processing queues.

According to the U.S. Department of Transportation, approximately 227 million international passengers entered U.S. ports of entry in 2017. This high volume of travelers is continuing to grow, potentially resulting in congestion in processing areas. “Developing more accurate and flexible tools to analyze the way changes in operations impact processing and queue times could result in a powerful capability to collect quantitative data to inform decision-making in the facilitation of the flow of travelers.”

LiDAR, or Light Detection and Ranging, is a method of surveying and sensing objects through the use of laser light. Quanergy’s awarded LiDAR capability consists of two parts—a mechanical spinning LiDAR sensor with a 360° field of view and a solid state—or non-moving—sensor.

Quanergy’s technology detects human presence and anonymously
analyzes and tracks the walking paths and density of travelers within the LiDAR’s field of view. When crowds are bottlenecked, CBP agents may be able to detect and adjust queues and staffing to optimize the customs and inspection processes.

**MRI for luggage**

Scientists at Los Alamos National Laboratory in New Mexico, have developed a system called MagRay, combining X-rays and nuclear magnetic resonance technology, based on the MRI scanning. “We combine the two methods to discriminate benign from threat liquids,” says Michelle Espy, a physicist at Los Alamos and MagRay’s project leader.

**Biometric Security**

Biometric technologies are also being tested that allows us to verify a person is who they say they are by using their own unique set of identifiers – fingerprints, iris scans or a combination of the two.

Two Homeland Security agencies entered the second phase of tests for a facial recognition technology that compares photos of airline passengers on international departing flights against a temporary cloud-based database populated with previously captured photos of passengers. The testing is the next step for the technology’s possible wider deployment by Customs and Border Protection and the Transportation Security Agency. Airports and airline partners where the system is being tested have said the system can shave 15 minutes off of traditional manual methods of comparing passenger ID photos against larger databases.
The second phase, tests how passenger photo data is stored and sent to TSA’s travel document checker for international outbound flights. The data from a CBP-owned camera near an agent’s podium takes a picture that is transmitted to TVS, converted into a template and matched against the preassembled passenger photos taken from other documents stored on other databases. The results are sent to the TSA agent’s tablet computer through a dashboard app.

A locally-developed Smart Security Investigator (SSI) system was unveiled by the Ministry of Interior (MoI) to detect potential smugglers or travellers infected with epidemic diseases at Qatar’s entry points. “The new system could identify suspicious travellers and speed up the clearance process, without unnecessary delays due to security related searches,” said Captain Ali Hassan al-Rashid, from the Internal Security Force (ISF)

“The new system depends on detecting the changes in the size of the retina of the eye and thermal changes of the person who stands before the sensor of the system for a few seconds,” “There are readings for normal persons and other indicators for persons with criminal conduct, which normally shows up in certain biological changes in the size of their retina or the temperature of their bodies. Such changes could be considerably different from those that display normal unrest, sickness or perplexity,” Captain al-Rashid stated.

Scientists are also working on monitoring physiological measurements such as breathing rates, heartbeats, perspiration and blink rates that may help spot and uncover terrorists.
The Transportation Security Administration has been quietly using a program called Quiet Skies to take notes on targeted travelers’ behaviors, according to multiple reports. The program will use an algorithm to analyze passenger travel patterns. It will then highlight to air marshals if they should observe the passenger more closely. TSA’s internal documents revealed that air marshals should observe behaviors such as excessive fidgeting, excessive sweating, cold penetrating stare, wide open, staring eyes, face touching, how much they sleep during a flight and using a smartphone.

**Ultrafast liquid explosive scanner to accelerate Airport Security checks**

The Laser Detect Systems Ltd. (LDS), an Israeli electro-optics company has launched a breakthrough in explosive detection systems. This system is able to accurately and reliably detect a wide range of explosives and other hazardous compounds in liquid, gel or powder form. It can also detect the materials sealed in plastic or glass as well as materials mixed or diluted with other substances in a bid to escape detection. It can also detect traces and residues of explosives on already inspected systems. The company sources say that the system offers high sensitivity, low false alarm rate and high throughput, performing a typical inspection in only 3 to 5 seconds.

The laser scanner employs advanced laser gated Raman spectroscopy scanning methods and has been built in cooperation with Israel’s security forces. According to company sources, the system has successfully undergone exhaustive testing by explosion detection experts, led by Israel’s internal security agency.
Cyril Dujardin is CEO of Morpho Detection, a leading supplier of explosives, narcotics and chemical detection systems. “We have developed technology around X-ray Diffraction that will allow airports to screen liquids in the bags at checkpoints without the need to take them out.” The future development could see it also being used to detect solid explosives if and when airports are required to screen solid explosives automatically at the checkpoint.

Transportation Security Administration missed a whopping 95% of guns and bombs in recent airport security “red team” tests. “However according to experts” We don’t need perfect airport security. We just need security that’s good enough to dissuade someone from building a plot around evading it”. There are also technology failures; the current screening technologies are terrible at detecting the plastic explosive PETN

“For me the ideal experience is no security,” said Dujardin. “Or, at least the feeling that there is no security – that everything is as much as possible automated and seamless for the passenger.”

**Security Market Growth**

The Airport Security Market is set to grow from its current market value of more than $9 billion to over $16 billion by 2024; according to a new research report by Global Market Insights, Inc.

Growing number of safety threats are compelling airports to become highly vigilant and are dictating the requirement for smarter security solutions. Such factors are driving
investments towards the development of screening and identification technologies such as RFID, biometrics in identity and access monitoring, contactless entryway checkpoints, x-ray scanners, and thermal cameras and prototype screening devices among others. Conventional security measures employ invasive procedures and protocols such as physical checks and body pat-downs which are highly uncomfortable.

To boost passenger convenience, airport security market vendors are investing in R&D activities for the development of technologies such as x-ray scanners. In high-risk settings, preventive measures are required over reactive technologies. In such cases, it is essential to track and forecast security threats in contrast to taking measures to fix the issues after their occurrence.

Screening technology was worth over USD 4 billion in 2015. Increasing adoption owing to the presence of the advanced features including metal detectors, X-ray machines and protection from sudden attack is fueling the technology demand. The ability to screen individuals and luggage to identify endangered material will positively impact the airport security market share.

The airport cybersecurity market is anticipated to dominate the revenue during the forecast time period. Cyber-attacks can be conducted from within the airport complex and from remote locations. Large airport that contain massive databases of critical customer financial and personal data are susceptible to these threats and are accounting to its high adoption. In
July 2013, for instance, the hacking attack on the software of Istanbul Atatürk and Sabiha Gökçen airports, caused the passport control systems to shut down at the departure terminal lines, causing customers to miss flights and experience delays for approximately six hours.

Asia Pacific is anticipated to witness significant growth owing to the attractive India and China airport security market share and growth prospects. The region accounted for over 25% of the global revenue in 2015. Economic growth and improving infrastructure are driving demand for advanced security solution in the region. Middle East & Africa airport security market size is expected to witness notable growth due to the rise in the vulnerabilities and undesirable attacks in the countries including Saudi Arabia and the UAE.

Prominent players in the airport security market include Smiths Detection, Safran Morpho, OSI Systems (Rapiscan), L-3 Security & Detection, and American Science & Engineering. Other notable players include, Bosch Security Systems, AutoClear LLC, CEIA, and Lockheed Martin. Technological innovations and increase in R&D expenditure are among the key strategies adopted by participants to offer differential solutions to maximize market share.

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