By Ian Harbison

Biometrics: Helping Travelers Go With The Flow

As passenger numbers rise, airports want to introduce new methods to speed up passenger and baggage processing without compromising security.

According to IATA, full-year demand in 2025 (measured in revenue passenger kilometers or RPKs) rose 5.3% compared to 2024. Total capacity, measured in available seat kilometers (ASK), was up 5.2% in 2025. The overall passenger load factor (PLF) reached 83.6%, up 0.1% and a record for full-year traffic. Of this, international demand rose 7.1% compared to 2024 and capacity by 6.8%. The full-year load factor was 83.5%, another record rise of 0.2% Domestic demand increased by 2.4% and capacity by 2.5%. The load factor averaged 83.7%, down 0.1%.

That inevitably means that the busiest airports are coming under increasing pressure to cope with sheer volume of passengers but making physical changes to terminals, or building new ones, is a lengthy and costly process, assuming there is enough real estate still available for construction.

Instead, they are looking at new ways to increase the efficiency of their handling processes, with biometrics and AI having a large role to play. One of the most important is border security, although this is controlled and run by government agencies, but faster document processing has positive

benefits in reducing congestion.

Even relatively simple changes in this area can have huge potential for change. For example, from July 2026, U.K. children aged 8 and 9 years, who are at least 120 cm tall and accompanied by an adult, will be able to use eGates at 13 airports. Based on 2025 U.K. arrival figures, that is an estimated 1.5 million children who would previously have had to queue with the entire family for manual checks, so the congestion in school holiday times should be substantially reduced.

However, this pales into insignificance when compared to the potential numbers involved with the European Union's Entry/Exit System (EES), which was launched in October 2025 and became fully operational in April 2026 across all 29 member states in the Schengen Area. This applies to non-EU nationals and will use a photo of the passenger's face and/or a scan of their fingerprints. This can be done at the airport by an official or registered beforehand. The system will also record any overstays and refusal of entry.

Amadeus

Jeff Lennon, vice president EMEA travel and governments at Amadeus, makes the point that it is those authorities that are driving the market and most applications cover all types of border crossings, not just airports. They have access to various technical specifications to help them develop a new biometric system from sources such as IATA, ICAO and, especially, the EU Frontex agency, which has been used by other countries.

Amadeus has been involved with airports for over 20 years, including the first biometric border control eGate solution with facial recognition that started in Portugal in 2007 and now works with over 30 governments with technology deployments over 200 airports.

An interesting project is a joint development between Amadeus and Sinergi Teknoglobal Perkasa for the Indonesian Directorate General of Immigration. Called Seamless Corridors, it uses AI-enabled biometrics to validate passenger identities while they are moving, rather than stopping to manually present documents to a border guard or at a counter. There are two corridors at Jakarta airport and one at Surabaya.

It was originally designed for passengers requiring special assistance. Using the All Indonesia app, which brings together immigration, customs, health and quarantine declarations, they can submit passport details remotely to allow the immigration service to perform background checks in advance. At immigration, cameras in the Seamless Corridor scan their face and matches it with the photo on file to accurately confirm their identity as they cross the border.

In a twist to the original idea, it was first used last year for Hajj pilgrims. Each year, around 220,000 people travel between Indonesia and Mecca in Saudi Arabia, the largest overseas contingent of any country., requiring a series of charter flights.

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During the 2025 operation, each Seamless Corridor processed more than 30 border crossings per minute at peak times, a more than ten-fold increase compared to current biometric eGates. In total, more than 50,000 pilgrims were processed.

Lennon says Indonesia is really a pioneer and very forward thinking. The Seamless Corridor will become more common in the future but many government agencies are risk averse so it will take a bit of time, as it substantially changes their operational model. However, there are a few projects around, such as the Red Carpet system at Dubai International Airport, where the Amadeus solution was also tested, and several other pilot schemes are due to start shortly.

Another recent project went live at Manchester Airport Terminal 2 in March, using biometric identity reconciliation that allows domestic and international passengers to seamlessly share the same arrival and departure infrastructure. Previously, traditional terminal designs used physically segregated domestic and international flows that are structurally inefficient, duplicate infrastructure and reduce asset utilization.

Now, domestic passengers traveling within the U.K.'s Common Travel Area can move fluidly through the terminal, while international passengers are seamlessly directed to standard U.K. immigration processes, including eGates or officer-assisted control operated by the U.K. Border Force.

Since going live, Terminal 2's biometric platform is now processing tens of thousands of passengers each month, with automated reconciliation rates consistently close to 99% across both inbound and outbound journeys. Operational data also confirms operational and economic benefits, including increased capacity and improved commercial performance. It is used for

Jeff Lennon Amadeus

passengers flying with airlines including Aer Lingus, Aurigny, British Airways, easyJet, and Loganair.

Lennon adds that the company is involved with other transport sectors as well, where the technology is equally applicable. One of these is the cruise market, where the first biometric terminal has gone into operation with MSC Cruises in Miami. With some ships carrying over 6,500 passengers the advantages of faster embarking and disembarking are obvious, especially as this includes shore excursions as well as border crossing.

Looking forward, he says the next trend will be "orchestration" of travel, using mobile phones and digital ID wallets with pre-vetted data to link travelers, airports, airlines and governments with other stakeholders such as hotels and car rental companies.

Another possibility is to help with airport disruption. International transfer passengers can be identified and the aircraft for the onward connection could be moved to a closer gate. Of course, their passage through immigration will be seamless.

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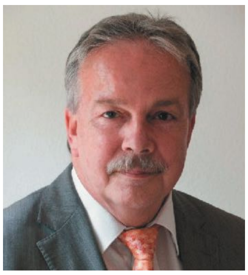
MODI Vision


Dieter Klawunder
MODI Vision

Dieter Klawunder, CEO of MODI Vision, says: "Most airports cannot simply rebuild infrastructure every few years. The future belongs to systems that can intelligently enhance existing environments while remaining operationally flexible."

Working alongside larger integrators and airport technology partners, the company has developed compact biometric edge devices that can integrate into existing infrastructure rather than requiring complete system replacement.

He notes that, while biometrics continue to expand globally, regulatory frameworks — particularly in Europe — remain a significant factor shaping deployment strategies. This centers on privacy protection, which is essential for long-term public acceptance of biometric systems. However, technologies such as encrypted remote enrolment, decentralized template storage and process-specific biometric verification are opening new possibilities for secure implementation while reducing data exposure risks.

He notes that passenger acceptance of biometrics is often much higher than many people assume, so the challenge is creating architectures that combine convenience, security and compliance in a trustworthy way.

If successful, a fully adaptive operational model where biometrics, passenger analytics and intelligent infrastructure work together will allow airports to become dynamic systems capable of continuously adapting to changing passenger behavior and operational conditions, instead of static environments built solely around maximum peak capacity.

The company has also identified one of the most overlooked inefficiencies inside terminals - traditional queue management systems. Across airports worldwide, retractable belt barriers continue to define passenger routing in security areas, arrivals halls and boarding zones. These systems are highly flexible from an installation perspective, but they are usually deployed in a configuration designed for peak periods.

The company recently filed a patent application for an intelligent gate module that can be integrated directly into existing belt-barrier systems. The concept allows airports to create temporary shortcuts through queue lanes in real time, depending on passenger density and operational demand.

Unlike conventional swing gates, the system is designed to move vertically downward when activated, minimizing the risk of passenger contact while preserving open flow dynamics.

Leidos

Seth Abrams, VP and CTO of airports, borders and security for Leidos' explains that his company does have the resources to develop whole networks, with experience of working with biometric data for large organizations within the Department of War and Department of Homeland Security.

There is also an opportunity to work with the vendors that capture and validate the data, including pilot schemes to see how they compare for speed and accuracy. However, he notes that some of those organizations have different requirements. The Department of Defense wants both while the Department of State, handling the sensitive storage and processing of passport data, places a higher importance on accuracy.

He says the company has been talking to the Transportation Safety Agency in the U.S. about these emerging technologies, such as eGates, and how they can help streamline travel.

Of course, he says, eGates are helpful but it is essentially a closed loop system for biometrics. The passport page is scanned and the camera image compared to the photo on the page and validity verified, but there is no transfer of biometric data to an external source. And that is the difference with biometric; the aim is to be able to identify someone using data held

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Seth Abrams
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elsewhere. Current U.S. laws limit the use of images captured at the airport, but the e-Gate can still enforce no fly information provided to it.

Just as in Europe, there is no consensus in the U.S. of whether or not biometrics can be stored for U.S. citizens.

There will also be a variety of passengers: those with pre-registered data, those traveling normally and those with entry restrictions. And domestic and international. That means different queues, so there needs to be some way of identifying and directing people to the right area to avoid generating a new bottleneck.

In a different area of operations, Abrams mentions baggage screening, where the company has been piloting remote operations. The X-ray image of a bag can be sent somewhere else for analysis, with an alert immediately sent back to the operators at the belt. This would allow more bags to be checked more quickly but avoid putting more people on the line.

Biometric identification could also be used for remote baggage drop off. If the system knows the passenger location and has all the relevant data, there is no need to go to a counter. Airlines call that biometric bag drop in a kiosk style that weighs the bag and sends it on its way.

He suggests this is part of a future possibility that would see wider use of mobile phones. If all the data was held on the phone and it is connected to the airport Wi-Fi, the passenger could be tracked by camera seamlessly from the terminal entrance to the gate.

To do that, though, requires a highly capable systems integrator.