



5 questions about the use of biometrics for traveler identity verification

TRAVEL

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Biometrics has proved its worth in traveler identity verification and is here to stay. The technology was initially used for government border control applications. Given the high degree of accuracy required to identify travelers crossing borders, fingerprint recognition was favored for many years. More recently however, phenomenal progress has been made using Artificial Intelligence (AI) to improve the accuracy and speed of facial recognition systems. Significant advances have also been made in making iris recognition a smoother and less intrusive process for passengers. All of these technological innovations have expanded the use of biometrics to more use cases in the travel industry.

1. Why is biometrics use steadily increasing in the air travel sector?

One of the key factors driving biometric identification roll-out in airports around the world is **travelers' expectation of more digitalized and streamlined processes** that allow them to control their journey. According to the *ACI World – ASQ 2022 Global Traveller Survey*, 72% of travelers are more likely to use self-service solutions and automated touchpoints than manual counters, and the *IATA 2022 Global Passenger Survey* indicates that 75% passengers would willingly use biometrics ahead of passports or boarding passes. The traveler mindset is crucial here: travelers are prepared to share their biometric data to benefit from an **improved experience and a faster journey**.

From the airport and airline perspective, providing a convenient experience and ensuring **faster onboarding enhances brand image and customer loyalty**. This is a key driver for deploying biometric traveler identity verification to as many touchpoints as possible, from check-in to boarding. Automated biometric systems boost operational efficiency and provide more effective **human and infrastructure resources**. The air travel industry has been convinced of the benefits of biometric technologies for years and started roll out with the One ID initiative years ago. The post-pandemic situation has merely served to reinforce the need to accelerate deployment to ensure smooth ground operations—hence the plethora of biometric system trials to facilitate passenger flow.

Border control authorities—the early adopters of biometric technologies—are now **adding face and/or iris recognition to their systems**. While in the past they tended to use only fingerprint recognition at automated border control (ABC) gate for passenger clearance, and manual counters for visa holder identity verification, the most advanced government services are now using **multiple biometric checks** at manual counters and self-service kiosks – and even mobile biometric devices for more agile controls and smoother passenger throughput. While fingerprinting was the norm back in the early days, **facial recognition is now the go-to technology**—and helps enlarge the passenger population eligible for automated border controls. The advances in biometric technologies and equipment have allowed border control authorities to go one step further in terms of security enhancement, and **focus human intervention where it is needed**—with the additional benefit that it streamlines the border clearance process for bona fide travelers.

2. Which biometric technologies work best for traveler identity verification?

Throughout the world, border authorities, airports and airlines are adopting three biometric technologies—fingerprint, face and iris recognition—to make the traveler journey from home to boarding gate as smooth and secure as possible.

The choice between one biometric technology and another is **not so much a question of performance**—face and iris recognition have caught up with fingerprinting in terms of reliability and efficiency over the past few years. The choice really depends on **use cases** as well as **cultural preferences** and cost considerations.

Depending on stakeholder requirements and objectives, they will look for the best tradeoff in terms of security, user-friendliness and cost:

- ➡ **Fingerprint recognition** was the first biometric technology adopted by border authorities and is still widely trusted. To make it even easier to use and respond to new hygiene concerns that emerged during the pandemic, contactless fingerprint solutions have also come into play.
- ➡ **Facial recognition** is the go-to technology, especially for passenger flow facilitation use cases where airports and airlines are looking for the most ergonomic solution in order to minimize interaction for the traveler while still ensuring a high level of security. It is also the best biometric technology, enabling passengers to check-in remotely via secure traveler identity verification from their smartphone.
- ➡ **Iris recognition** is a valuable addition that enhances border control systems. It is the most reliable biometric data over time and the most difficult to fake. The latest advances allow walk-through iris capture in less than 2 seconds, while meeting the most stringent security requirement based on advanced anti-spoofing capabilities.
- ➡ **Multi-biometric solutions** come into play when enhanced security is needed—most often at critical border touchpoints. They typically combine fingerprint with face and/or iris recognition.

At Los Angeles International Airport, **facial recognition** is used to offer travelers a secure and seamless boarding experience. In India, facial recognition technology will be deployed at Delhi, Hyderabad and Goa airports to verify the identity of domestic flyers—offering them a **digitalized and streamlined experience** for terminal entry and security clearance.

While **iris is by far the most accurate and stable biometric over time**, its adoption may be hampered by the fact that government databases and passports do not generally support this biometric. Another reason for slower adoption may be the **special equipment** required—unlike facial recognition, which simply uses a webcam. While this equipment is becoming more affordable as technology improves, there are still certain limitations. For passenger flow facilitation, for example, the iris cannot be used for remote enrollment via a smartphone, meaning that enrollment has to take place at the airport. On the other hand, iris recognition is predominantly used in the Middle-East due to cultural preferences. It is also used in Changi airport in Singapore to enhance security, together with fingerprint and facial recognition.

3. Are there certain prerequisites for using biometric identification when traveling?

The main points to consider when implementing a biometric system for border control or passenger flow facilitation are the legal framework, the IT infrastructure, the choice of equipment and solutions, infrastructure compatibility and, **above all, passenger acceptance**.

For example, to be able to offer an end-to-end self-service journey to travelers from coach to gate, airports and airlines need to **upgrade their check-in application with biometric capability that allows remote enrollment**. However, they should also provide in-situ alternatives for travelers who do not own a smartphone—or whose smartphone camera does not have sufficient definition for biometric enrollment. These passengers won't be able to check-in from home but they will still be able to begin their biometric passenger journey when they arrive at the airport by using a **self-service kiosk**. This will capture their face biometric data with the required quality level and match the **security requirements** needed to deploy a fully automated traveler identity verification journey.

It is also important to stress that the benefits of biometrics are not limited to passengers holding a biometric passport. For travelers who do not have a biometric passport, it is possible to securely retrieve their personal data – including their picture – by capturing their passport data page in order to create a unique identifier linked to their biometrics.

But the most important prerequisites for deploying a biometric system for traveler identity verification are **passenger consent** and **compliance with local regulations** concerning personal data and privacy protection. In certain European countries, such as France, the use of biometrics is highly regulated and is more readily accepted for border control use cases—where it enhances security—than for passenger flow facilitation (despite successful trials conducted by Air France at Paris Charles de Gaulle Airport, or by VINCI Airports at Lyon Saint-Exupéry Airport).

4. What are the key steps in the passenger biometric identification journey?

The steps in **the passenger biometric journey may vary** depending on the use case (border control, passenger flow facilitation, or a combination of both). Also, depending on the project specification or local regulations, the different touchpoints of the biometric system may use either **authentication** (i.e. 1:1 match between passenger passport data and live capture of their fingerprint, face and/or iris), **identification** (i.e. recognition of passenger based on their enrolment in the database of the border control authority, airport or airline, without the need to present the passport after check-in), **or they may even provide both options** to accommodate passenger preferences.

Depending on regulations, border control authorities – and in some cases airports and airlines (based on user consent) – may be authorized to securely hold passenger biometric data for the duration of the trip or for up to a couple of years. Here, as always, **the first and most critical step in the traveler biometric journey is enrollment**, during which the passenger's biometric data will be captured in order to subsequently proceed with traveler identity verification. Travelers will only be enrolled once and won't need to go through a full enrollment process again during the defined period.

Under the European Entry/Exit system, Third Country Nationals wanting to cross a Schengen border will have to enroll on their first visit to a self-service kiosk (passport scan, four-fingerprint capture, face acquisition) and will have to go to a manual counter to complete the clearance process **before they can go through an automated gate**. On subsequent border crossings they will be able to use a self-service kiosk to verify and update their personal data with their passport and a capture of their face. They may then proceed directly to the automated gates, or they may occasionally be redirected to the counter if further controls are required by a border guard.

Other deployment models exist where airports and airlines do not have – or do not want – the authority to retain traveler biometric data, even for a short period of time. In this scenario, **passengers alone hold their biometric data**, which can be stored on their smartphone or even encrypted and encoded in their boarding pass barcode.

5. Where can biometric technologies be used to help with traveler identity verification?

Biometric technologies were adopted years ago by border control authorities in airports due to the strategic nature of air borders and the large volumes of travelers. This early adoption was also driven by intrinsic air border constraints in terms of infrastructure size. In airports, biometric self-service touchpoints and automated eGates allow not only border authorities, but airports and airlines as well, to **manage very high volumes of travelers with a smaller footprint than that required by manual counters.**

For **land and sea borders**, although the interest in automated passenger identity verification powered by biometrics is more recent, initiatives to reduce queues and provide a more digitalized and streamlined experience for travelers are **emerging on all continents.** Automated border control e-Gates have already been deployed at two UAE seaports as part of this country's multi-biometric Entry/Exit program. In Singapore, the Woodlands and Tuas land checkpoints have already been equipped with automated gates and the country's Automated Border Control System will be expanded to other land and sea checkpoints. As part of the European Entry/Exit System, certain countries such as Iceland and Lithuania will also deploy biometric systems in seaports, train stations and at land border crossing points.

In comparison to airports, land and sea borders present specific challenges due to their specific features, the different modes of transport used by travelers and the variety of traveler profiles that need to be processed. To handle these different environments, border crossing points may be equipped with **a combination of fixed, mobile and handheld biometric technologies.**