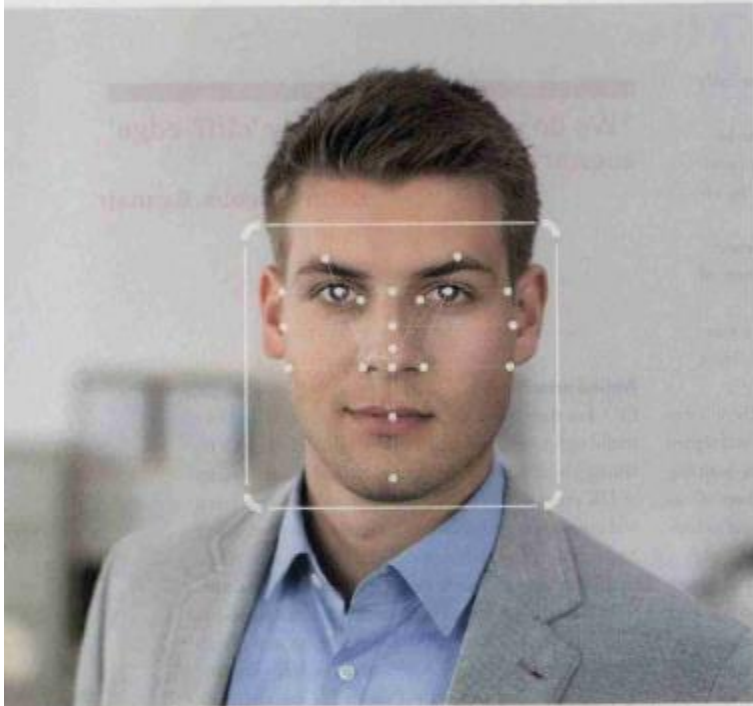


Air Transport World



JETBLUE

Facial and fingerprint recognition is moving from the lab to airports.

BY HENRY CANADAY

BETTER WITH BIOMETRICS

Kiosks and online check-in have relieved much of the line agony passengers once experienced at airports. But these technologies were installed as other queues were growing, for baggage, security and border control. Overall, today's passengers may not feel their airport journey has been eased. Could another technology, biometrics, help? Governments, airlines, airports and their technology partners have begun experimenting. Better, faster and more accurate biometric tools are coming online. The new tools could enhance border control and air-travel safety, while helping passengers get through airports quicker and with fewer security and airline staff required. Essentially, biometrics could recognize passengers, negating the need for staff to check all IDs. Some call it "hand-in-pockets" travel. There

is work to be done and choices to be made, especially in standardizing processes and fitting equipment into tight airport space, but the long-term outlook is promising.

Biometrics started with governments eager to improve their processes. Australian border authorities have used biometrics to verify the identity of 27 million travelers, nearly half of arrivals, since 2007 and begun using biometrics to check departures in 2015. Both facial recognition and fingerprints are used. Australian officials say biometrics are more accurate than document checks and biometric data more difficult to forge than paper documents.

Spain has installed face- and fingerprint-recognition kiosks at two of its largest airports. The technology speeds passport control for travelers with Spanish elec-

tronic ID cards or European Union e-passports.

SITA has completed a proof of concept on facial recognition for security at Doha International Airport in Qatar, where the great majority of traffic is transferring through the facility. At the main security gate, a device captured a facial image from each passenger's passport or national ID card and matched this with the actual passenger's face. The match interacted with government systems to check on passenger risk, and boarding passes were captured to verify onward flights. Matched and cleared passengers had faces checked again at gates for departure. The initial check took 20 to 30 seconds, and the match at the gate only five to 10 seconds.

Another Doha test combined both steps at the boarding gate itself, with a camera confirming the traveler's face matched his or her travel document. This took a little longer than the first security check.

In July 2017, border authorities tested facial recognition for exit on one American Airlines international flight from Chicago. The carrier noted that checking physical passports will always be necessary for boarding international flights, since they are required at destinations.

The US Transportation Security Administration is testing fingerprints submitted under its expedited PreCheck program as substitutes for both identity documents and boarding passes at screening in Denver and Atlanta.

Airlines also see advantages in biometrics for easing passenger journeys at their touchpoints. SITA tested facial recognition at Brisbane Airport. Air New Zealand passengers check in at kiosks with e-passports, a camera verifies faces match passport images, and passengers then use their faces as boarding passes at gates. SITA plans to extend facial recognition to baggage drops and more airlines, then to test it for preclearance on flights to Auckland.

New York-based JetBlue Airways, meanwhile, is conducting a test on departures from Boston to Aruba. Passengers step up to a camera and have their faces checked against a border patrol database of passport, visa or immigration images for their flight. The approach eliminates both manual passport checks and boarding pass scanning. If it is successful, the carrier may extend it to other airports and touchpoints.

No more boarding passes?

Finnair tested facial recognition at Helsinki, with 1,000 frequent flyers submitting facial images and then using a designated desk to check in with just faces. The carrier says this could eliminate the need for boarding passes.

Delta Air Lines has begun facial matches with passport images for checking bags at Minneapolis-St. Paul. Another Delta test lets frequent fliers enrolled in CLEAR, a \$15-per-month program for automating ID checks before security screening, use fingerprints to



check in to Delta's lounge at Reagan Washington National Airport. The test is being extended to bag check-ins and flight boarding with the same biometric. And Delta has tested the capture of facial images for border authorities at departure gates in New York and Atlanta.

Delta COO Gil West predicts that face, iris or fingerprints will eventually be the only identification needed for many transactions, at airports or elsewhere. Sean Farrell, who directs government and security solutions at SITA, says "end-to-end is coming." He hopes a single biometric will eventually be used at all identification points at airports. These could include check-in, bag drop, security, border control and departure, even entry to the airport, if fear of terrorism dictates this step is necessary.

But which biometrics, and how might they be used?

Facial recognition is practical for international flights that require passports. More than half of international travelers carry e-passports that allow easy, fast access



FINNAIR

to facial images. Machines can match actual faces with small databases very rapidly.

But fingerprints on e-passports are difficult to access. "You need digital keys to unlock them," Farrell said. So this biometric requires passengers to submit fingerprints beforehand. And they must touch an imaging plate for the match.

Speed and accuracy depend on matching task. A one-to-one match of a face with an e-passport image, as SITA did in Doha and Brisbane, is instantaneous and extremely accurate. Matching a face with stored images of a few hundred passengers on one flight can be done in milliseconds. This requires tuning software to maximize matching rates while avoiding false positives of more than one in 10,000 times. It yields perhaps 3% false negatives, which require human intervention.

Larger "one-to-many" matches, for example of all passengers leaving an airport in the next several hours, would take longer and be less precise. Matching a face with images of all passengers at all US airports is impractical.

Image capture also raises questions. One-time captures of a digital face or fingerprint is most convenient. But privacy advocates say this is risky. They worry especially about software that could capture and match faces outside airports.

Whizzing through airports with only a camera capturing faces is appealing. But there must probably be some check, manual or electronic, that the passenger

has his physical passport before boarding an international flight, because it will be needed on arrival.

Walk-up convenience

Biometric approaches tend to differ according to whether they serve governments, which demand accuracy, or airline touchpoints, which emphasize convenience.

Tugberk Duman is project manager at Futurice, which helped Finair test facial recognition at Helsinki. He is talking to other airports about biometrics, emphasizing easing passenger journeys. "Biometrics have been perceived as an additional security measure and associated with extra hassle," Duman explained. "We want to change that."

Futurice enabled 1,000 volunteers to register facial images on personal devices with a special app. Then they just walked toward a special check-in desk. A camera captured their pictures "on the go" and matched these with one of the 1,000 registered images, all in 150 milliseconds.

Duman thinks this effortless matching, with no special kiosks or elaborate gates, could make facial recognition attractive to passengers. He predicts constant improvement in recognition software, rather than hardware, will make it possible in perhaps 10 years.

Software is certainly improving. Lithuania's Neurotechnology made the matching system used at Spanish airports. Its newest system can do 1.2 billion one-to-one fingerprint matches per second, 1.2 billion faces per second or 700 million eye irises per second.

Farrell argues for SITA's smart-path approach. It uses gates at certain checkpoints to ensure identity has been verified. Smart-path could apply to both private and government touchpoints. Farrell says it would not change any basic processes, just automate them where possible. He is seeing interest from government security and border officials.

And passengers like the idea. A SITA survey reports that passengers who used biometrics for passport checks and boarding rated this experience well above that of face-to-face transactions. Fully 57% would use biometrics on their next trip. Farrell sees no technology hurdles, but says biometric tools "require critical mass to catch fire."

As with kiosks and online check-in, the best approach will likely give passengers several choices among biometric and manual ID checks. **ATW**