

# **Biometric Boarding using Identity as a Service:**

## The potential impact on liability in the aviation industry

July 2018

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## Project participants

**IAG:** International Consolidated Airlines Group is one of the world's largest airline groups, flying to 268 destinations and carrying around 105 million passengers each year. IAG combines leading airlines in Ireland, the UK and Spain, enabling them to enhance their presence in the aviation market while retaining their individual brands and current operations.

**British Airways:** British Airways is one of the world's leading global premium airlines and the largest international carrier in the UK. It has its home base at London Heathrow, and flies to more than 200 destinations in 75 countries across the globe.

**CBP:** U.S. Customs and Border Protection is one of the world's largest law enforcement organizations, charged with protecting the borders of the United States; keeping terrorists and their weapons out of the United States while facilitating lawful international travel and trade.

**IATA:** The International Air Transport Association is the trade association for the world's airlines, representing some 280 airlines, and over 80% of total air traffic. IATA supports many areas of aviation activity and help formulate industry policy on critical aviation issues, including the development of new technology and innovation.

# Glossary

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## APIS

- Advance Passenger Information System (APIS) is an electronic communication system whereby required biographic passenger information is collected and transmitted to border control agencies prior to flight departure or arrival, and to the airport of entry.
- Government agencies use this information to screen passengers against databases to determine their authorization to travel.

## Biometrics

- Unique behavioral or physiological characteristics.
- Physical biometrics include fingerprint, hand geometry, facial recognition, and iris and retinal scan.

## Biometric Enrollment

- Capturing one or more biometrics for later use.
- The passenger can be enabled for identity verification via biometric recognition at a biometric touchpoint.

## Biometric Recognition

- To match an individual against the image or data of an existing biometric capture for instant identity verification.
- This is included in the identity verification terminology.

## Identity as a Service

- Identity as a Service (IDaaS) is an authentication infrastructure managed and operated by a third party. Under IDaaS solutions, the process to authenticate and/or verify an individual's identity is delivered via a remote connection to a third-party provider, often via cloud-based systems, as opposed to being managed on site and by in-house personnel alone.

## Traveler Verification Service

- Traveler Verification Service (TVS) is the trusted IDaaS solution deployed by U.S. Customs and Border Protection Agency. TVS automates the biometric identity verification and authentication process and is being introduced for flights to and from the United States.

## Identity Authentication

- Comparing a passenger biometric representation with a registered identity.
- This ascertains that the person is who they say they are, matching against information stored on the physical or virtual token.

## Identity Registration

- Prior to the travel journey, approved authority establishes identity based on evidence, and issues a persistent physical or virtual token (e.g. e-passport application; trusted traveler application; other government issued secure token, etc.).
- This involves biometric registration.
- The passenger is then eligible to be biometrically authenticated.

# Executive Summary

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## The industry is working towards a shared vision for air travel

The challenge of enabling sustainable growth and meeting rising demand for air travel requires new collaborations, new technology and new processes; identity management innovations in particular will impact all stakeholders. By working together, and addressing existing inefficiencies, the industry can deliver benefits for passengers, governments, airlines and airports.

Passenger identity management is a key area of focus for commercial aviation. It underpins the complete passenger process from booking through to exiting the airport. During a typical journey the passenger will interact with multiple stakeholders and these interactions are reliant on the assertion of the passenger's identity. Layers of legacy technology, process and regulation has meant that for passengers, asserting their identity is a cumbersome and time-consuming process.

Biometric technology and identity management solutions are increasingly common-place in airports around the world. First generation solutions have made great strides in improving the speed and ease with which passengers pass through airports. The emergence of next generation biometric identity solutions that accurately match a single facial image within a gallery of thousands, at speed, have the potential to transform air travel for all stakeholders.

Traditionally, a passenger's identity is asserted manually by an individual examining a physical travel or identity document in the effort to confirm the person is who they say they are. With little or no coordination and cooperation between stakeholders, airlines, airports and government agencies ensure their responsibility are met in isolation, resulting in a poor and repetitive customer experience. Further, these processes may force the passenger to disclose more data than is required from their passport to some of the stakeholders (such as place of birth, middle names or national identification number). This issue is removed by moving to an identity management platform that automates identity verifications and protects the customer's identity at the airport.

With new biometric identity solutions, the identity assertion is performed by an automated system, meeting set criteria which have been determined by the owner of the system and agreed upon by all stakeholders. These systems have the potential to be used across all touchpoints, to the benefit of multiple stakeholders. Crucially this can only happen if the current, increasingly outdated set of rules and responsibilities are reviewed, and a new *trust framework* can be agreed by the parties involved.<sup>1</sup>

This paper examines these implications in the context of recent, ongoing and future trials between British Airways and the U.S. Customs and Border Protection agency utilizing their recently developed Identity as a Service solution, the Traveler Verification Service.

## Principle Findings

### It is imperative to modify processes to support continued growth

Current processes and infrastructure will not be able to sustain air-travel given the projected increases in passenger numbers. World air traffic is growing at 4.9% per annum, and the latest IATA forecast expects 7.8 billion passengers to travel in 2036, a near doubling of the 4 billion air travelers in 2017<sup>ii</sup>. Merely expanding infrastructure is not viewed as a viable solution.

### The current liabilities impacting airlines limit progress towards modernizing air travel

Airlines have taken extensive steps and built global business processes to comply with a variety of rules and regulations associated with air travel. Major groups of liabilities associated with international travel include: accurate advance passenger information data, identity verification at boarding and bag-check, and travel document credential checks. This paper is focusing on liabilities associated with passenger identity verification.

### IDaaS is helping to realize the shared vision for air travel

The challenge of enabling sustainable growth and rising demand for air travel requires new collaborations, new technology and new processes. Trusted IDaaS' offer a viable means to transform the current process to achieve safe, frictionless, air-travel while enabling governments to perform critical immigration and security functions. By working together, and addressing existing inefficiencies, the industry can deliver benefits for passengers, governments, airlines and airports.

### The introduction of a trusted IDaaS significantly impacts the operation of the boarding process and has the potential to benefit multiple stakeholders

The introduction of automated identity verification, which is currently a manual airline-operated identity checking process, has the potential to improve the accuracy of identity verifications and better protect passenger's data.

### Government-to-Government engagement will be vital

Governments set the requirements that airlines must abide by, whether to control immigration at the border, or to maintain security. As such they are critical stakeholders. As identity management processes change, and particularly when governments themselves are responsible for operating identity processes, future agreement concerning reliance and liability will increasingly need to be agreed between governments themselves.

### The existing framework of rules and agreements should be reviewed

The current set of national and international rules, and the bilateral agreements that overlay them, are increasingly challenged by new processes such as IDaaS, and are in increasing need of review. As processes and responsibilities change, a new (potentially multilateral) trust frameworks will need to be agreed.

# Chapter 1: Introduction

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Passenger identity management is a key challenge for commercial aviation as it underpins the passenger's entire journey, from booking to border. Passengers are forced to assert their identity with multiple stakeholders at different touchpoints, which results in a cumbersome and time-consuming process.

International air travel is set to be revolutionized for passengers over the coming years. New, innovative technologies and processes are being developed which could be transformative; ensuring border controls are more secure, airport processes are more efficient, and that passengers have their data and identities protected whilst experiencing a friction-free journey. There are several priorities important to multiple stakeholders involved in international air travel operating environment that are also driving these changes, that include:

- **Passenger data:** Protecting passenger data is a crucial necessity and airlines, governments and airports are constantly seeking to advance this.
- **Passenger convenience:** Passengers are increasingly expecting experiences that are both secure and friction-free, however, the current airport experience has a number of repetitive inconveniences.
- **Sustainable growth:** The global demand for air travel is projected to continue to rise, with passenger numbers expected to double over the next 20 years. Many airports currently have little spare passenger capacity and by speeding up known process bottlenecks, such as the time taken to check and board passengers, capacity can be increased<sup>iii</sup>.
- **Stronger borders:** A number of countries are looking to strengthen their border security operations and at better ways to monitor and record the movement of people across their borders.

## The future vision for air travel

Traditionally, the processes of confirming a passenger's identity is through a paper or document driven process. In response to the changing operating environment and emerging international challenges, the global air travel industry's shared vision involves changing the way in which a passenger's identity is authenticated. The future vision changes this model so that passenger biometrics can replace repetitive paper or document-based checks that are less secure and convenient.

There are a number of identity-related innovations to facilitate the passenger process which are being implemented around the world, some of which are outlined in Diagram 1, on page 8. These initiatives are building towards the industry's future vision for air travel, which includes:

- **Passenger data is better protected**
- **Friction-free, fast and convenient experience for passengers**
- **Delivering stronger security and border control without impacting on passenger convenience**
- **Building common standards and a multi-lateral international approach**
- **Increasing capacity within the system through greater efficiency**

Biometric technology and identity management solutions are increasingly common-place in airports around the world. First generation solutions have made great strides in improving the speed and ease with which passengers pass through airports. The emergence of next generation biometric identity solutions that accurately match a single facial image within a gallery of thousands, at speed, have the potential to transform air travel for all stakeholders.

A significant innovation in the identity management space is an Identity as a Service (IDaaS) solution developed by U.S. Customs and Border Protection (CBP), called the Traveler Verification

Service (TVS) that is currently being trialed by several airlines. One of these trials, in partnership with British Airways, uses biometrics to identify and board passengers on outbound flights from LAX (Los Angeles) and MCO (Orlando) airports to LHR (London Heathrow) and LGW (London Gatwick) airports. With TVS, passengers have their face biometrically matched to a previously verified image, determining their identity without the need for a passport or boarding pass to be shown.

## CBP's trusted Identity as a Service solution streamlines identity processes

TVS has been introduced by CBP to biometrically identify and record passengers when they enter or leave the country<sup>iv</sup>. All passengers who have been to the United States, or are holders of US Passports, will already have verified images stored as a result of the current immigration processes. First-time travelers to the United States will have their facial image verified and stored against their biographic details as part of the normal entry process. Photos of all passengers are thereby readily available upon departure without needing to show a passport or other identity document in advance.

### Identity as a Service

IDaaS solutions can be provided by organizations operating in either public or private sector; in the case of TVS the service is provided by CBP, a U.S. Government Agency. The TVS system is relied upon by the airline for verifying the identity of passengers prior to boarding.

Confirming a passenger's identity and their right to travel has traditionally relied on manual processes undertaken by airline staff checking passenger's passports to establish their identity. The limitations of the current boarding processes impact on governments, passengers, airlines and airports.

- Passengers are required to present their passport and boarding pass on a number of occasions, which is inefficient, and creates friction for passengers.
- For Governments, manual processes that check identity are not considered to be as secure as newer biometric methods.
- The speed and ease of boarding is constrained by the need for airlines to meet their responsibilities, which currently requires the checking of documents and passenger's identities prior to boarding, which can cause unnecessary delays.

To help to address these challenges, TVS streamlines identity processes by enabling biometric confirmation of identity, removing the need for manual checking, with a number of intended benefits:

- By increasing the speed of identity authentication, and achieving this by automated biometric matching, TVS aims to ensure faster, more convenient boarding for passengers.
- By limiting the disclosure of personal information, the application of TVS also ensures that passengers' identities are better protected when boarding the aircraft.
- Governments should benefit from accurate biometric exit or entry records for immigration purposes.
- For airlines, faster boarding for the majority of passengers enables staff to focus their time on higher-need passengers.
- Airlines should benefit from increases to the accuracy of the automated process, reducing the risk of mis-identifications leading to fines and other associated costs.

## White paper objectives

This white paper will describe the emerging operating environment and international challenges, consider the impacts of TVS when used by the airline on how passenger identity checks are carried out immediately prior to boarding, changes in the operation of these identity management processes, and the degree to which this could impact on airline responsibilities and liability.

It also looks to the further roll-out of TVS at other airport touchpoints, the benefits and challenges that may arise from this and presents a future vision for air travel, highlighting what would need to happen for this to become a reality.



## Chapter 2: Global Identity Innovation

In order to define the future for international air travel, a range of innovative identity schemes are being developed in locations around the world, seeking to help passengers assert their identity more easily, while enabling governments to keep a better record of who enters and leaves a country. The number of existing projects indicates the growing need to better manage identity in air travel.

### A selection of the identity developments being introduced worldwide

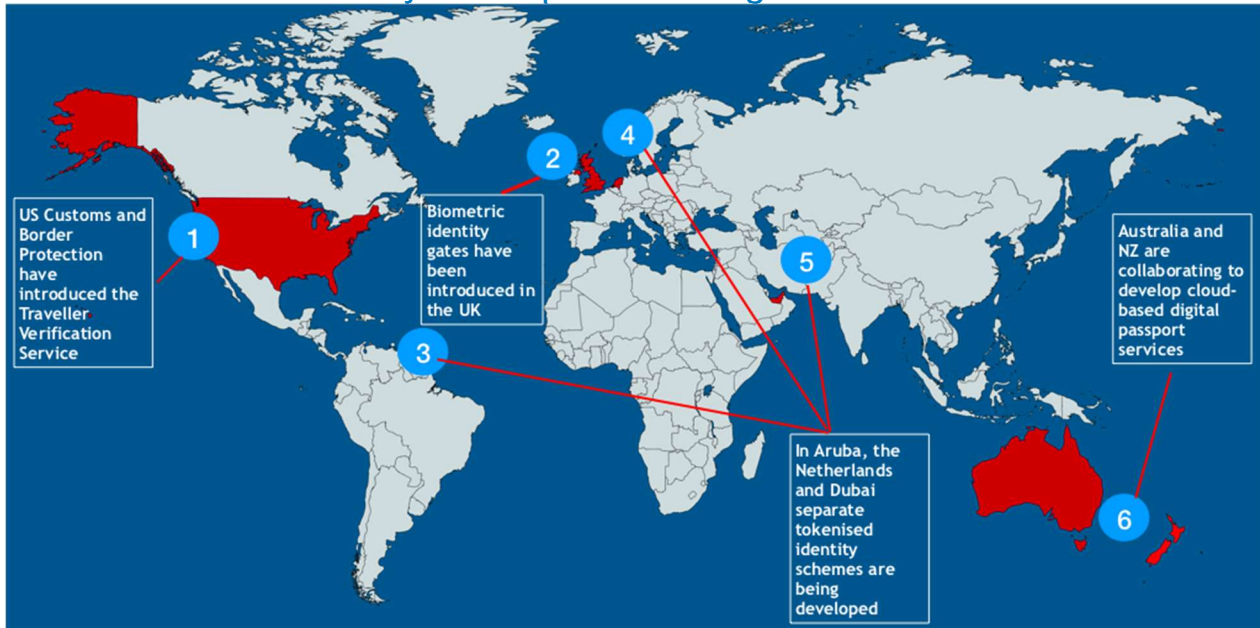


Diagram 1

### One ID

As part of defining the future, and to provide a way to bring the various international developments together, IATA has developed the One ID initiative. Through this global programme, IATA is leading the industry in delivering an end-to-end passenger experience that is secure, seamless and efficient. One ID seeks to introduce a collaborative identity management solution that spans across all process steps and stakeholders in the end-to-end journey from booking to destination, putting the passenger in the center.

This involves the use of:

- A trusted, digital identity; for a simplified, faster process to check identity.
- Identity Management Platform; for the sharing and use of data by different stakeholders in a collaborative manner, and according to the “privacy by design” principle.
- Biometric recognition technology; for instant identity verification throughout the various process steps.
- A Trust Framework; for stakeholders to trust one another, trust the data and co-operate on a common identity management platform.

### One ID Objectives

The standardization and harmonization of frameworks, processes, data models, and data interchange protocols will be crucial to expedite and maximize the benefits for all.

As such, the objective of the One ID initiative is to bring industry and government stakeholders around the table to establish a common vision and roadmap and pursue the development and adoption of standards and recommended practices<sup>v</sup>.

# Chapter 3: The Existing Process

This chapter will outline and explain the passenger booking to boarding processes that are currently employed by British Airways to satisfy their requirements. These responsibilities are common to many jurisdictions, but the details often vary; what follows is focused on the requirements specifically applying to flights departing from the US.

## From ticket to arrival: the current British Airways customer journey

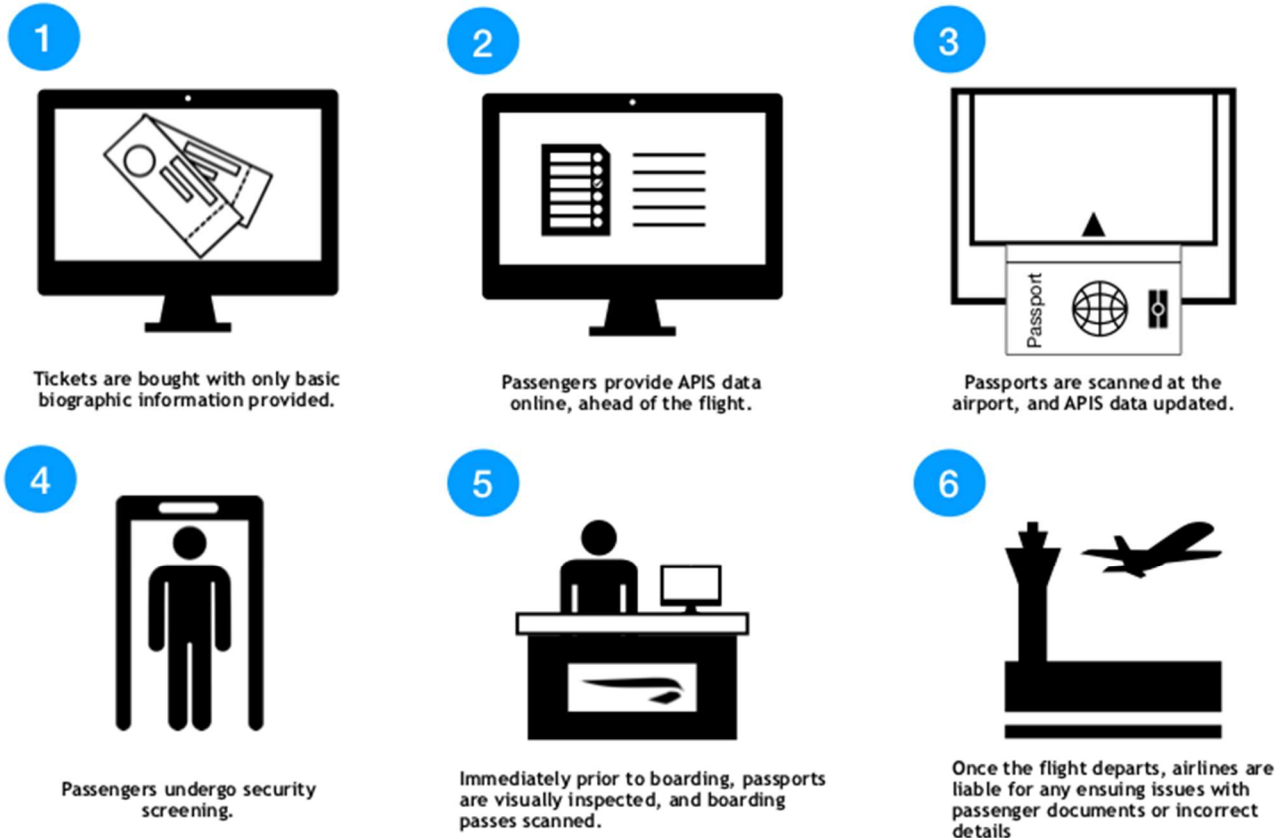


Diagram 2

### 1 Ticket booking

Tickets are bought through a variety of channels, with minimal biographic information provided by the passenger. At the point of purchasing a ticket a passenger is not obligated to provide significant details, nor is the data provided by the passenger (including identity information) verified.

### 2 Online check-in

In most cases the passenger's biographical information is self-asserted to the airline as part of the online check-in process. This APIS data is then securely transferred to the relevant national government agencies. In the case of the United States, Department of Homeland Security uses DocVal and Secure Flight systems to check the passenger's entry entitlement details (passport, visa or visa-waiver) and other records, and the results are returned and held in the airline's Departure Control Systems.

### 3 Passport check

For passengers travelling to or from the United States it is an obligation for the airline to ensure that the passenger has the correct and declared passport in their physical possession. This responsibility can be satisfied by the airline undertaking an electronic scan of the passenger's passport at the airport.

This ensures that the requisite passport is present with the traveler, enables an update of APIS records with data obtained from the passport, and validates the biographic checks previously undertaken. Automated screening of the passenger's APIS is also undertaken by the airline to minimize the risk of carrying ineligibly documented passengers. These processes collectively manage an airline's liability risk and enables them to satisfy a number of the responsibilities the government places upon them.

## 4 Security screening

The passenger passes through security screening. Currently in the case of US to UK flights, this includes another assertion of identity, during which a passenger presents their passport or other suitable identity documentation at the security checkpoint, along with their boarding pass. The passenger then enters the secure airside part of the airport terminal.

## 5 Boarding

Airlines undertake an inspection of passports and boarding passes prior to the boarding the aircraft. This is currently undertaken visually by a member of the airline's staff at the departure gate, to ensure that the passport matches the individual in question and matches the boarding pass. The boarding pass is also scanned and checked against the passenger manifest, and this data is used to identify who has boarded the aircraft, which is sent to the relevant government agencies once the flight has departed.

## Current process issues

Currently, the airline is responsible for authenticating and verifying the identity of all passengers. Failure to meet these obligations may result in a fine to the airline from the receiving government, as well as the expectation to return the passenger back to the origin. To address the liability risks, airlines have developed processes that requires passengers to assert their identity at multiple steps.

These obligations and liabilities have collectively shaped a process that has several challenging issues, including:

- **Manually entered APIS data is not verified, and can be incorrect**  
The APIS data that passengers provide via webforms may feature a number of simple mistakes<sup>vi</sup>, but accurate APIS data is important for Governments to undertake screening of passengers and is a responsibility of the airline to provide. This is part of the reason for additional passport checks that are currently carried out at the airport.
- **Repeated identity and passport checks within the airport are inefficient and create passenger friction**  
The need to ensure that the passport is physically present, and for identity to be authenticated at numerous parts of the passenger journey, creates the need for inefficient duplicative processes and passenger frustration.
- **Manual/visual passport authentications are inefficient, and open to error**  
The checks carried out by airline staff prior to boarding are not infallible, and mistakes do occur. Research has demonstrated that while performance varies between individuals, manual checking of identity is not watertight. This remains a concern for airlines in seeking to manage their responsibilities and, therefore, their liability risk, and for Government immigration control and entry/exit record keeping<sup>vii</sup>. This process also results in passengers showing more personal data than is required to identify themselves.

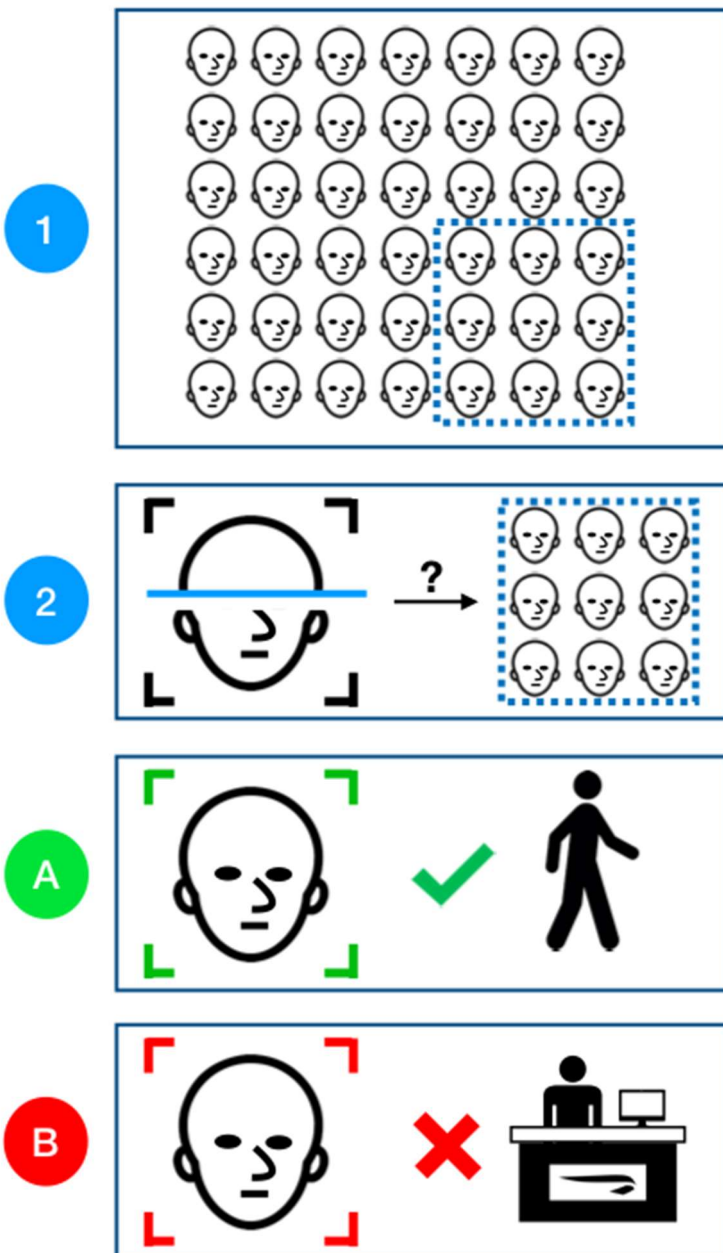
# Chapter 4: The Biometric Boarding Trial

This chapter explores the impact that the introduction of TVS, a government provided IDaaS, will have on existing boarding processes, focusing on the trials being undertaken from LAX and MCO airports on flights to LHR and LGW respectively.

## A trusted IDaaS significantly impacts the operation of the boarding process

CBP's TVS can be used by airlines to replace the existing airline operated manual/visual checks of passports and boarding passes carried out prior to passengers boarding the aircraft, with a government-operated passenger biometric identity verification.

### Trial process



From existing image databases, the TVS system creates galleries of expected airline passengers for that specific flight based on information provided by the airlines (APIS). The gallery facilitates a 'one to N' solution, designed to allow CBP to biometrically identify individuals from amongst a large group of verified identities.

A passenger's facial image is captured at the boarding gate, which enables the passenger to be identified and their identity authenticated against the number of verified passenger images held in the gallery. This process is triggered automatically when the passenger walks up to the self-boarding gate.

Once the passenger's identity has been authenticated by TVS, the airline's boarding management system then provides a response to board the passenger and the boarding gates open.

If a match cannot be identified to the required level of assurance, or there is an issue with the reservation, the passenger must be processed by reverting to current manual procedures (as explained in diagram 2, Boarding).

Diagram 3

## From ticket to arrival: the customer journey under the TVS trial

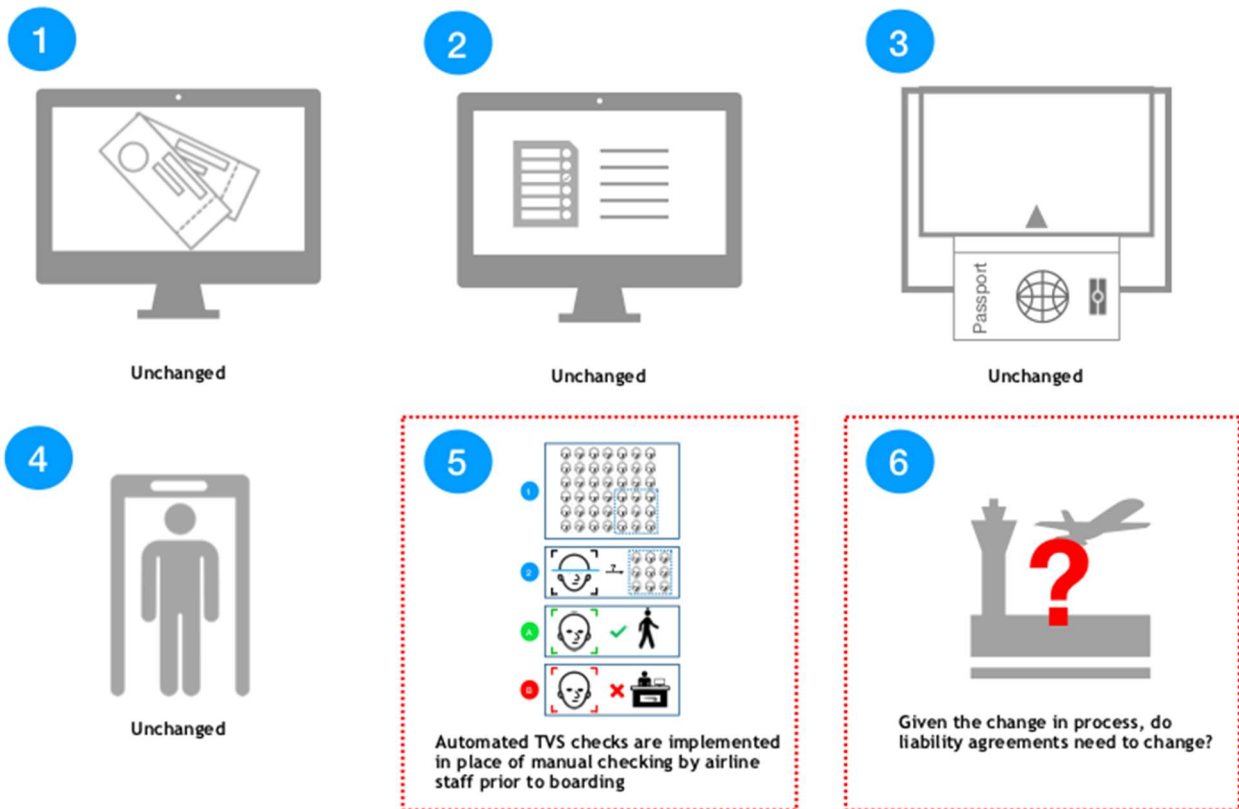


Diagram 4

Shown in diagram 4 above, process steps 1-4 in the trial process remain as currently applied.

### 5 Boarding

The process changes to boarding are as a result of the introduction of the automated gates (or other systems) and the utilization of TVS. This change of control in the operation of the identity management process at boarding has been transferred from British Airways to CBP. For passengers that pass through the automated gates, the CBP-operated TVS system completely replaces the existing manual/visual identity check that is currently undertaken by airline staff prior to passengers boarding the aircraft. Passengers at this stage do not need to present a boarding pass or passport to progress.

*“The Traveler Verification Service was built to use face biometrics to enhance security and increase traveler facilitation—at the same time. We do not see security and facilitation as a choice we have to make, we can have both.”*

**Colleen Manaher, Executive Director, Office of Field Operations, U.S. Customs and Border Protection**



Biometric self-boarding gates at Orlando Airport  
Image 1

## Trial results: the initial findings

The trials conducted so far have provided positive results:

- 1 Use of the TVS system enables the aircraft to be boarded more quickly**  
The typical TVS system response time from a passenger's image being taken to a gate decision is under a second. In the British Airways LAX-LHR trial, A380s, with over 450 passengers, have been consistently boarded in under twenty-five minutes, compared to the average of forty-five minutes with the current manual process.
- 2 The passenger's boarding experience is more convenient**  
There is no need for a passenger to show their passport or boarding pass at the boarding gate. It also better protects the passenger's personal data as the identity check has been automated.
- 3 The TVS system matches are more accurate than the current checks**  
The TVS system is demonstrating a passenger matching accuracy of over 99.9%. This compares very favorably to the results of research applied to human-operated passport checks undertaken by a number of institutions<sup>viii</sup>.
- 4 The automated gates enable staff resources to be optimized**  
Staff at the departure gate focus more time on providing customer care, or on servicing higher need passengers, rather than identifying all passengers boarding the aircraft.
- 5 The trial process does not impact other concurrent processes**  
The application of the TVS system is limited in the self-boarding trial explained above. Other processes such as biographic APIS data collection and checking, and other passport and security checks, are unaffected.
- 6 The trial process is compliant with GDPR**  
The General Data Protection Regulation<sup>ix</sup> which came into force in May 2018 affects how personal data is managed and transmitted from and within the EU. The current trial has been assessed by British Airways and is considered to be compliant with the requirements of the General Data Protection Regulation.

While the end-to-end process is largely unchanged until the boarding stage under the current trial process, the overall travel vision is that identity management (whether using TVS or not) could streamline all parts of the travel process. The benefits listed above could potentially be transferrable when applied to other identity management processes within the airport.

The current trial is in effect testing only a limited deployment of TVS. In future, the roll-out is planned to include a much wider range of airport touchpoints. British Airways is also seeking to cooperate with other governments that are looking to develop an IDaaS solution.

*“Our customers want the ability to simplify and speed up their journeys through the airport, so we’re investing in the most advanced technology that will enable us to streamline our boarding process and further improve our punctuality.”*

**Carolina Martinoli, Director of Brand and Customer Experience, British Airways**

## Next steps in the biometric boarding trials

With the success of the biometric boarding trials, a number of future developments are known to be taking place in the near term for both British Airways and the U.S. Customs and Border Protection Agency:

### The exceptions process will undergo further development

- The aim is eventually for all passengers to be successfully processed via the automated biometric gates. However, there are currently cases where passengers cannot be matched and are rejected by the TVS system. In such cases, the passenger is denied access via the automated gates, and is directed to a manual exceptions process. This is operated by airline staff, who undertake further investigation as to why the passenger was denied access, including a visual document check.
- Development will take place to find ways to include passengers who are currently unable to be processed by the gates, whether due to physical or age limitations, or due to a photo not being available in the existing databases.

### British Airways is introducing TVS equipped self-boarding gates across JFK Terminal 7 and beyond

- British Airways, convinced by the positive results of the self-boarding TVS trials out of LAX and MCO, is shortly to roll-out TVS equipped self-boarding gates in the flagship JFK Terminal 7 for all long-haul flights.
- The airline is also seeking to partner with more airports so to adopt the process to board all flights outbound of the US.

### CBP is extending facial biometric matching to entry and exit management across all US international airports

- CBP is mandated to introduce biometric identity management across all international air entry and exit points<sup>x</sup>.
- CBP is therefore continuing to roll-out the application of TVS to a wider range of airports and routes over coming months, with several other airlines also continuing to trial the TVS.
- Future uses for TVS across different touchpoints in the airport environment are being planned for trial, such as at bag-drops and security checkpoints.

## Chapter 5: Rules, Responsibilities and Liabilities

A number of identity management processes have been designed to enable an airline to carry out its responsibilities and manage the risk of liabilities occurring. Liabilities can apply to airlines either in the direct costs of fines, or via the costs associated with processing or repatriating a passenger that arrives without the required documentation, and the accompanying loss of seat revenue, and administrative costs.

### The International framework of rules and responsibilities

The detailed responsibilities and liabilities of airlines in any given jurisdiction are created by the national and international laws that govern air travel. These rules are then supplemented (for example by applying agreed standards, processes, fines or liability waivers that might apply) by bilateral Memorandums of Understanding (MOUs), usually agreed directly between a national government or its agency, and the airline.

The global liability framework is therefore enshrined in hundreds of MoUs across the industry, as well as in international and national legislation:

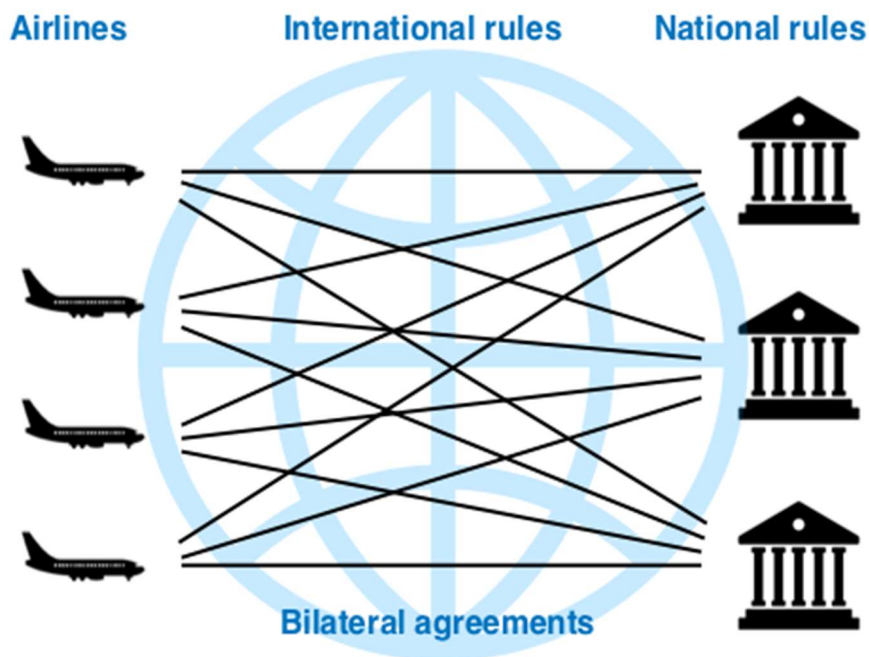


Diagram 6

### A framework of bilateral agreements is complex and inefficient

Under the current arrangements, each individual airline must agree, track, review and periodically renegotiate a series of MoUs, each differing in detail, with individual governments or government agencies. For a large international airline this is a highly complex and resource-intensive task.

The content of the existing agreements will also be increasingly challenged by new identity management solutions, such as TVS, particularly when applied beyond the bounds of the limited trials currently taking place.



## Airlines' current identity management responsibilities and liabilities

Airlines are currently held responsible to ensure travelling passengers are correctly documented to enter the receiving country. Table 1, below, outlines the potential scenarios that can arise and what the current outcomes are for the passenger and airline.

|   | Potential Scenario  | Current Outcome   |
|---|---|---|
| 1 | Passenger arrives with inaccurate APIS data having been supplied to receiving authorities | <ul style="list-style-type: none"> <li>• Passenger accepted</li> <li>• Airline fined*</li> </ul>  |
| 2 | Passenger arrives at the border with invalid or no travel authorization                   | <ul style="list-style-type: none"> <li>• Passenger rejected</li> <li>• Airline fined*</li> <li>• Airline repatriates passenger</li> </ul> |
| 3 | Passenger arrives at the border with invalid or no travel documentation                   | <ul style="list-style-type: none"> <li>• Passenger rejected</li> <li>• Airline fined*</li> <li>• Airline repatriates passenger</li> </ul> |
| 4 | Passenger arrives at the border with passport that does not match person                  | <ul style="list-style-type: none"> <li>• Passenger rejected</li> <li>• Airline fined*</li> <li>• Airline repatriates passenger</li> </ul> |
| 5 | Passenger arrives at the border and presents second valid passport                        | <ul style="list-style-type: none"> <li>• Passenger accepted</li> </ul>  |
| 6 | Passenger arrives at the border on a holiday visa, but intends to work                    | <ul style="list-style-type: none"> <li>• Passenger processed by authority</li> </ul>  |
| 7 | Passenger arrives at the border with prohibited contraband                                | <ul style="list-style-type: none"> <li>• Passenger processed by authority</li> </ul>  |
| 8 | Passenger arrives at the border seeking asylum  | <ul style="list-style-type: none"> <li>• Passenger processed by authority</li> </ul>  |

\* Airlines may have a MoU with the government agency that results in no fine being issued

Table 1

Airlines therefore manage their liability risk by applying the identity management processes that currently exist:

- **Online check-in** ensures that the airline is able to provide the biographic APIS data to border agencies, by collecting it in advance from the passenger.
- **Passport check** ensures that the airline can update any APIS data errors prior to the passenger's departure and enables the airline to ensure that the passenger has the travel document in their physical possession at the airport, that it is theirs and that it is valid.
- **Exit control** ensures that the passengers are positively identified, compared against the expected passenger manifest and recorded by the airline as having boarded.

Airlines directly meet their responsibilities, and reduce their liability risk, by operating the existing identity management processes at the airport, which makes it repetitive and cumbersome for the passenger.

## Liability conclusions from the biometric boarding trial

With legacy boarding processes, the airline manages the risk of a fine or cost arising from a failure to meet its responsibilities by manually identifying passengers prior to boarding. The process of authenticating the passenger's identity, in the biometric boarding trial outlined above, has moved this management of passenger identification and verification out of the airline's own control and into CBP's, where it relies upon the IDaaS, TVS.

- Process 1 through 4 are unchanged.
- Process 5 **Boarding** - the application of IDaaS in the form of the TVS system has transferred operation of the identity management process at boarding to CBP. The airline is therefore reliant on the successful operation of TVS by CBP to manage its liability risk.

**Utilizing TVS at boarding, British Airways have reduced their overall risk for incorrectly identifying passengers by passing on the management of this identification to TVS. This liability, however, still legally resides with the airline entirely. Governments need to recognize that as airlines no longer solely control the identity verification processes, the associated liabilities should not rest solely on them. In alignment with the global shared vision for air travel, government should seek broad international consensus regarding how to re-balance these liabilities.**

## Chapter 6: Future Developments

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British Airways and U.S. Customs and Border Protection, foresee the future of air travel without the need for passengers to use a passport or boarding pass at any stage of the departing airport journey. Rather, by relying upon a trusted IDaaS, airlines use an identity check managed by the receiving government. This would result in passengers progressing through each airport touchpoint using only their facial biometric to assert their identity and acquiring the authorization to proceed.

### Vision Statement: U.S. bound passengers

To prove this concept with TVS, a scenario is explained below whereby a passenger is flying from the UK to the US without needing to present a passport or boarding pass at the airport.

- The required APIS data submitted by the passenger is confirmed as accurate, as CBP have found a match in the database for a passenger that has previously been enrolled via their immigration entry process / U.S. passport application.
- The passenger has the authorization required to travel from the US government, as the interactive APIS data exchanged between the airline and government notes if there is a valid visa / passport on file, and that the security checks have been passed. This authorization is held within the airline's Departure Control System and will prevent a non-authorized passenger progressing through the airport.
- The person presenting themselves at the airport touchpoint (bag drop, security entrance and boarding) is matched to the biographic data submitted after being biometrically matched to it by TVS.
- The passenger is on the flight manifest and is accepted by the airline's Departure Control System, satisfying British Airways' checks.
  - Those passengers that CBP cannot match biographically (for example due to incorrect APIS data having been supplied) will have their passport scanned at one of a number of airport touchpoints to update their APIS record.
  - If the passenger has yet to enter the United States (and therefore has no image record already in the database) they will be processed as currently takes place.

This, therefore, could remove the need to scan or see a passport or boarding pass at the departing UK airport, extending the benefits from the boarding trials, explained earlier, to the rest of the airport journey. The passenger's biometrics can be used instead by the positive match to the previously submitted biographic data.

### Potential for liability to be reconsidered under the vision statement

In the application of TVS at a US bound departure from the UK, the US government not only provides IDaaS from which the airline identifies and verifies a passenger, but it also provides the authorization to travel. The liability of the airline in this process, which is essentially removed from the process itself, can be challenged; it is the US government that is managing the system, but could also still potentially fine the airline if its own system failed.

## Potential changes to airlines' responsibilities and liabilities utilizing TVS for UK-US flights

Potential liability changes are set out in Table 2:

|   | Liability Scenarios   | Current Outcome   | New Outcome   |
|---|---|---|---|
| 1 | Passenger arrives with inaccurate APIS data having been supplied to receiving authorities | <ul style="list-style-type: none"> <li>• Passenger accepted</li> <li>• Airline fined*</li> </ul>  | <ul style="list-style-type: none"> <li>• Passenger accepted</li> </ul>  |
| 2 | Passenger arrives at the border with invalid or no travel authorization***                | <ul style="list-style-type: none"> <li>• Passenger rejected</li> <li>• Airline fined*</li> <li>• Airline repatriates passenger**</li> </ul> | <ul style="list-style-type: none"> <li>• Passenger rejected</li> <li>• Airline repatriates passenger**</li> </ul> |
| 3 | Passenger arrives at the border with invalid or no travel documentation                   | <ul style="list-style-type: none"> <li>• Passenger rejected</li> <li>• Airline fined*</li> <li>• Airline repatriates passenger**</li> </ul> | <ul style="list-style-type: none"> <li>• Passenger rejected</li> <li>• Airline repatriates passenger**</li> </ul> |
| 4 | Passenger arrives at the border with passport that does not match person                  | <ul style="list-style-type: none"> <li>• Passenger rejected</li> <li>• Airline fined*</li> <li>• Airline repatriates passenger**</li> </ul> | <ul style="list-style-type: none"> <li>• Passenger rejected</li> <li>• Airline repatriates passenger**</li> </ul> |
| 5 | Passenger arrives at the border and presents second valid passport                        | <ul style="list-style-type: none"> <li>• Passenger accepted</li> </ul>  | <ul style="list-style-type: none"> <li>• Passenger accepted</li> </ul>  |
| 6 | Passenger arrives at the border on a holiday visa, but intends to work                    | <ul style="list-style-type: none"> <li>• Passenger processed by authority</li> </ul>  | <ul style="list-style-type: none"> <li>• Passenger processed by authority</li> </ul>                              |
| 7 | Passenger arrives at the border with prohibited contraband                                | <ul style="list-style-type: none"> <li>• Passenger processed by authority</li> </ul>  | <ul style="list-style-type: none"> <li>• Passenger processed by authority</li> </ul>                              |
| 8 | Passenger arrives at the border seeking asylum  | <ul style="list-style-type: none"> <li>• Passenger processed by authority</li> </ul>  | <ul style="list-style-type: none"> <li>• Passenger processed by authority</li> </ul>                              |

Table 2

\* Airlines may have a MoU with the government agency that results in no fine

\*\* CBP would not cover the cost of repatriation under any circumstance

\*\*\* TVS should identify and reject any passengers lacking authorization

### The implications for liability are likely to become more significant under future deployment of TVS

- Identity trust frameworks will need to be agreed between governments before a more complete application of TVS will be possible, similar to the agreements that were once developed to underpin the world-wide use of passports.
- As future IDaaS platforms are developed and applied, the need for agreements to be reached directly between governments, rather than airlines and governments, is expected to become even more pertinent.
- As TVS replaces other manual passport inspections, the need for passports to be physically examined may diminish over time, leading to greater reliance on IDaaS platforms and their interoperability.

In the future, airline liability could be dramatically reduced from the introduction of government managed IDaaS. This is a result of the airline relying upon a government system that identifies the passenger and then gives a determination on the authorization to travel.

## Chapter 7: Delivering the Future Vision for Air Travel

The range of identity-related initiatives being implemented around the world are all building towards delivering the industry's future vision for air travel:

- Personal data is better protected
- Friction-free, fast and convenient experience for passengers
- Delivering stronger security and border control while reducing the impact on passengers
- Building common standards and a multi-lateral international approach
- Increasing capacity within the system through greater efficiency

### **Governments should engage in multilateral discussions with the industry**

The global air travel industry operates within a framework of national and international rules, and agreements between airlines and national authorities. They must, therefore, remain highly connected and interoperable.

The responsibilities of airlines and governments for carrying out identity management is changing, and governments will increasingly rely upon systems like TVS to identify passengers arriving at their borders. In such circumstances, a bilateral agreement between an airline and a single national government will be insufficient to provide an effective international framework. Under such a circumstance, it is argued that the airline's liability should be reconsidered for identity management systems and processes for which it no longer has responsibility for operating.

There will likely need to be a future agreement reached between Governments and relevant airlines, regarding how the introduction of a government managed IDaaS changes the liabilities between the parties.

*“CBP recognizes that use of the TVS will require changes to the ways the government interacts with airlines and airports, and we are ready to begin discussions with industry on regulatory changes that need to occur as a result of this new identity process.”*

**John Wagner, Deputy Executive Assistant Commissioner, U.S. Customs and Border Protection**

### **New processes will make existing rules obsolete: without the rules changing, the business viability of the future vision will be undermined**

The existing framework of rules and agreements is being challenged by the application of new processes, including biometric recognition and identification. The rules, far from shaping industry processes, now stand in the way of their advancement.

A review of the current identity rules and agreements, that drive airline's airport processes, must take place. Without revision the business case for change will be significantly undermined.

*“Your identity is your most valuable possession, and we aim to protect it. We are taking a privacy-by-design concept and are creating a trusted Identity as a Service (IDaaS) to facilitate the growing passenger numbers. This principle also shapes the future of all our operational process and places the passenger at the centre of it.”*

**Glenn Morgan, Head of Digital, IAG**

## A more holistic approach to liability will be needed

The current web of bilateral MoUs is difficult to manage and complex. TVS and other similar IDaaS platforms are likely to catalyze discussions regarding liability across the whole industry to simplify and the agreements. A more efficient development seen in other industries has been to develop a multi-party *Identity Trust Framework*<sup>xi</sup>.

Identity trust frameworks are agreements used to govern a variety of multi-party systems, where the participants wish to engage in a common type of transaction with other participants, and to do so in a consistent and predictable manner<sup>xii</sup>. They each rely on a set of mutually agreed specifications and rules, covering a range of issues, including liability arrangements.

For further information regarding the application of identity trust frameworks, see: [www.openidentityexchange.org](http://www.openidentityexchange.org)

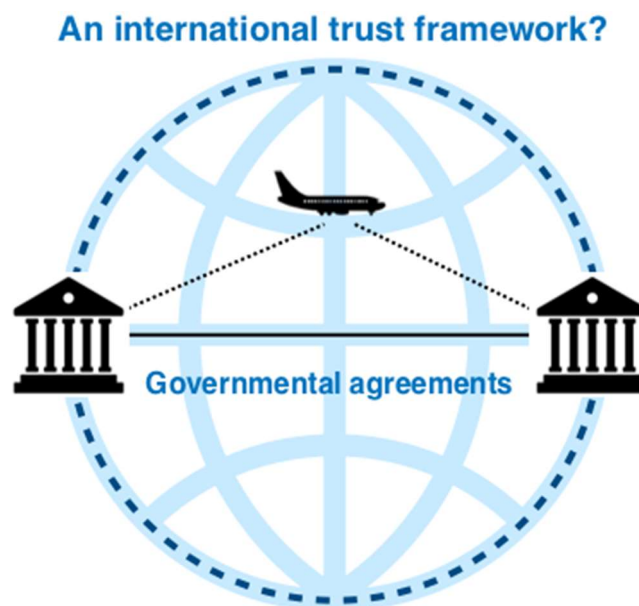


Diagram 7

*“With passenger traffic projected to double by 2036, our industry must find a way forward to remove inherent costs and complexities to the business. We identified the urgent need to redefine an end-to-end passenger process that would be more passenger centric. One ID will aim to bring all aviation industry stakeholders together to define a common approach for a collaborative identity management solution that spans all process steps and stakeholders in the end-to-end journey from booking to arrival at destination, putting the passenger in the center.”*

**Nick Careen, Senior Vice President, Airport, Passenger, Cargo and Security, IATA.**

## One ID can help to deliver the vision

Delivering a truly multilateral, connected approach, which will involve the alignment of international practice, policy and standards, and the development of a new liability framework, will need a greater degree of engagement and co-ordination than the global industry currently demands.

The IATA One ID programme will become increasingly important as an initiative that can help to align and co-ordinate the industry, working together with governments and other key stakeholders.

# Chapter 8: Conclusions and Recommendations

## Developments like TVS are inevitable and vital

With the projected future increase in passenger numbers, and the heightened need for increased security, developments like TVS are inevitable, and will only increase in their application in future.

## All stakeholders could benefit from a trusted Identity-as-a-Service concept

### Passengers:

- Personal data better protected
- Less time spent queuing at boarding gates.
- A 'hands-free', more convenient and less repetitive process.

### Governments:

- The TVS system enables accurate records to be kept of all passengers entering or leaving the United States.
- Identity checks with TVS are more accurate than current manual checks.
- The process is now reliant on accurate biometric and biographic data that has been verified by CBP.

### Airlines:

- Improved boarding times and more efficient process, enabling staff time to be optimized at the boarding gate.
- It is more accurate than existing identity verification processes, reducing the risk and therefore cost of an airline's ongoing liability.

### Airports:

- Capacity is increased by faster processing.
- Better utilization of existing infrastructure.

## Liability remains unchanged within the current trials – but will be impacted in the future

The trial process does not (currently) impact on the airline's responsibility or liability. However, as TVS is applied more widely, and other similar schemes come online, responsibilities, and potentially liabilities, will need to be reconsidered.

## Governments are vital stakeholders

Future standards, responsibilities and liabilities should not be agreed solely between airlines and single jurisdictions. Government to government discussions and agreements will be required as third parties such as the airlines utilize IDaaS platforms to process passengers.

## Delivering the future vision will require a new trust framework

Further extensions to TVS and similar schemes can bring further benefits to all stakeholders - but only if the current framework of rules and responsibilities is changed, and a multilateral approach taken. The One ID initiative is an important component of delivering the vision across multiple stakeholders.

## Recommendations:

### 1 Encourage wider stakeholder engagement

Emerging identity management systems like TVS require not just a relationship of trust between airlines and national Governments in isolation. Changes will affect all stakeholders, and a wider range of interests should be engaged in the discussion.

### 2 Bring governments into the discussion

Direct government to government agreements are likely to be needed to fully capture the benefits of new identity management solutions, and to facilitate their wider implementation. Constructive, ideally multilateral, engagement by Governments would be a major step forward towards delivering the future vision for air travel.

### 3 Quantify the benefits and challenges in more detail

Further research and open discussion of the results is needed to fully quantify and communicate both the benefits and challenges involved.

### 4 Collectively review existing rules and agreements

Some existing national rules and airline responsibilities which drive current airport processes would require revision as, they may appear increasingly outdated with the introduction of innovative identity management solutions. The review should be based on the purpose of the original requirement, and whether those requirements are still necessary following adaptation of an Identity as a Service concept.

### 5 Consider a new approach: explore the development of a trust framework

New identity management processes no longer apply in national isolation. A common trust framework could provide an interoperable, connected international framework of rules and agreements, better reflecting the interconnected systems and processes upon which the industry, and governments, will rely on in future.



## References

- <sup>i</sup> For further details of Trust Frameworks and their application to identity management systems, see: [http://www.openidentityexchange.org/wp-content/uploads/2017/06/OIX-White-Paper\\_Trust-Frameworks-for-Identity-Systems\\_Final.pdf](http://www.openidentityexchange.org/wp-content/uploads/2017/06/OIX-White-Paper_Trust-Frameworks-for-Identity-Systems_Final.pdf) and <https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.8149.pdf>
- <sup>ii</sup> IATA 2036 Air Passenger Forecast: <http://www.iata.org/pressroom/pr/Pages/2017-10-24-01.aspx>
- <sup>iii</sup> <https://nats.aero/blog/2013/11/five-ways-improve-airport-capacity-without-extra-runways/>
- <sup>iv</sup> For further information: <https://www.cbp.gov/travel/biometrics/biographic-vs-biometric>
- <sup>v</sup> For further information on One ID initiative, see: [https://www.iata.org/whatwedo/passenger/Documents/OneID\\_Concept\\_Paper-Version1-January2018.pdf](https://www.iata.org/whatwedo/passenger/Documents/OneID_Concept_Paper-Version1-January2018.pdf)
- <sup>vi</sup> <http://oixuk.org/wp-content/uploads/2017/09/Transforming-the-Airline-Passenger-Journey.Sept17.pdf>
- <sup>vii</sup> <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0103510>
- <sup>viii</sup> <https://doi.org/10.1371/journal.pone.0103510> and <http://journals.sagepub.com/doi/10.1177/0963721416688114>
- <sup>ix</sup> For more information visit <https://ico.org.uk/for-organisations/guide-to-the-general-data-protection-regulation-gdpr/>
- <sup>x</sup> <https://www.cbp.gov/frontline/cbp-biometric-testing>
- <sup>xi</sup> For more information see: [http://www.openidentityexchange.org/wp-content/uploads/2017/06/OIX-White-Paper\\_Trust-Frameworks-for-Identity-Systems\\_Final.pdf](http://www.openidentityexchange.org/wp-content/uploads/2017/06/OIX-White-Paper_Trust-Frameworks-for-Identity-Systems_Final.pdf)
- <sup>xii</sup> As *xi* above

**OIX** The Open Identity Exchange is a technology agnostic, non-profit trade organization of leaders from competing business sectors focused on building the volume and velocity of trusted transactions online, particularly by facilitating and sharing research.