Unrestricted



FUTURE OF PASSENGER DATA

FACILITATION PASSENGER DATA SHARING IN AN OFFER AND ORDER ENVIRONMENT

OCTOBER 1, 2026

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Foreword

International air transport is entering a decisive phase of transformation. The changes underway extend beyond incremental improvement and point to a **fundamental shift** in how the industry creates, sells, services, and fulfils travel.

Modern Airline Retailing is advancing the use of **Offers and Orders** in place of traditional reservation constructs. This evolution is enabling increasingly digital, dynamic, automated, and personalized travel services, supported by data and emerging digital identity capabilities.

The implications extend beyond airline commercial systems. Governments rely on **passenger data** to support border security, risk assessment, law enforcement, effective border management, and the facilitation of legitimate travel. These public policy objectives remain unchanged. However, many of the mechanisms used to transfer passenger data were designed around legacy airline systems, static records, batch messaging, and fragmented implementation.

A **structural gap** is therefore emerging. The industry is moving toward more dynamic, event-driven, and interoperable environments, while passenger data transfers to border control authorities continue to rely on legacy formats and are affected by inconsistent interpretations and implementations of international standards. Unless addressed in a coordinated manner, this gap risks increasing complexity and carrying existing fragmentation into future environments.

The transition to Offers and Orders also introduces an evolving relationship between the **retailer** that manages the customer's offer and the **supplier, including the operating carrier**, responsible for delivering the service. This relationship may change which party holds, controls, or can access passenger and Order data. Further industry work is needed to determine the **minimum information that must be available to the supplier or operating carrier** so that applicable operational, security, facilitation, and regulatory obligations can continue to be fulfilled.

The **IATA Future of Passenger Data Task Force**, established under the Facilitation Working Group and IATA Travel Standards Board governance, has developed this white paper to frame these challenges and identify the principles and areas of work required to manage the transition. Its objective is **not simply to replace PNR with Orders or to prescribe a single future technical solution**. It is to ensure that passenger data obligations can continue to be fulfilled consistently, securely, and lawfully, regardless of how airlines structure their commercial and operational systems.

The underlying **border management, security, and facilitation objectives will remain**. States will continue to require passenger data in accordance with national laws, international obligations, and the provisions of **ICAO Annex 9, Facilitation**. The challenge is to ensure that this information can be provided through mechanisms that are secure, trusted, interoperable, proportionate, auditable, and sustainable on a global scale.

This white paper brings together **two complementary priorities**. The first is the need for **globally aligned passenger data standards, semantics, implementation practices, and governance**. **Interoperability cannot be optional.** Without consistent implementation of shared standards, fragmentation will deepen and undermine both government objectives and industry efficiency.

Second is the need to manage the **gradual coexistence of PNR-based and Order-based environments**. This requires a **record-agnostic approach** through which the passenger data required by governments can be assembled and provided consistently, whether it originates from a PNR, an Order-related environment, a Departure Control System, or another airline source system.

Taken together, these priorities support one objective: a **globally interoperable passenger data ecosystem aligned with Modern Airline Retailing**, in which governments receive the information they require through secure and trusted mechanisms, airlines can modernize without creating unnecessary compliance burdens, and passengers benefit from more seamless travel.

Achieving this objective will require **coordinated action** among airlines, governments, international organizations, retailers, suppliers, and technology providers. It will also require further analysis of how existing Advance Passenger Information, Interactive Advance Passenger Information, Passenger Name Record, and other regulatory reporting requirements will be supported as airline systems and business relationships evolve.

The future of passenger data is **not simply about replacing PNR with Orders**. It is about **modernizing how passenger data obligations are fulfilled** while preserving security, facilitation, privacy, interoperability, and global consistency.

The direction is clear. The task now is to move together.



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Executive Summary

The **IATA Future of Passenger Data (FOPD) white paper** sets the strategic direction for the evolution of passenger data transfers as the airline industry transitions toward **Modern Airline Retailing and Offer and Order-based models**. In this environment, an Offer represents a proposal for air travel products and services, while an Order supports the management of fulfilment, servicing, and settlement throughout the journey.

At the same time, governments will continue to require **Advance Passenger Information (API), Interactive Advance Passenger Information (iAPI), and Passenger Name Record (PNR) data** to support border security, risk assessment, law enforcement, effective border management, and the facilitation of legitimate travel. These public policy objectives remain unchanged, but the mechanisms through which the required passenger data is sourced, assembled, and transferred will need to evolve as airline commercial and operational systems change.

Passenger data requirements are established through national legislation and supported by international instruments, including **ICAO Annex 9, Facilitation**, and relevant United Nations Security Council resolutions. These requirements apply independently of how an airline structures its internal commercial and operational systems. FOPD therefore advances the principle that legal and regulatory obligations should remain **technology-neutral and independent of a specific airline business record**, while transmission standards may continue to prescribe defined formats and interfaces.

This approach requires **record-agnostic compliance**. Passenger data required by governments should be capable of being assembled and provided consistently whether it originates from a PNR, an Order-related environment, a Departure Control System, or another airline source system. An Order is an airline business construct, not a government passenger data transmission message, and the information required for regulatory transfers may be distributed across multiple airline systems and services.

The transition to Offers and Orders also introduces an evolving relationship between the **retailer** that manages the customers' offer and the **supplier, including the operating carrier**, responsible for delivering the service. This relationship may change which party holds, controls, or can access passenger and Order data. **Further industry work is required to determine the minimum information that must be available to the supplier or operating carrier** so that applicable operational, security, facilitation, and regulatory obligations can continue to be fulfilled. The alignment discussion identified this as a central issue, particularly where the operating carrier is not the retailer but remains responsible for government passenger data obligations.

Today's passenger data environment is characterized by **fragmentation across data semantics, implementation, and governance**. Inconsistent interpretations of standards, non-standard national requirements, and legacy interfaces increase operational complexity, affect data quality, and undermine interoperability and auditability. They can make it more difficult for airlines and authorities to trace and verify what passenger data was shared, when it was shared, and how regulatory requirements were fulfilled. The objective is not to redefine existing government obligations, but to **modernize how those obligations are fulfilled**.

FOPD consequently supports the evolution of **globally aligned and interoperable passenger data standards**, underpinned by consistent semantics, coordinated governance, data protection, and consistent implementation. This includes alignment at both system and semantic levels, together with the continued use of internationally recognized travel document specifications.

The transition will be **incremental and prolonged**, requiring the coexistence of PNR-based, Order-based, and hybrid environments. API, iAPI, and PNR transfers may remain distinct because they serve different purposes and are governed by different legal frameworks, even where their underlying source data is managed through shared airline capabilities. Managing this coexistence will require mapping, validation, translation, and governance arrangements that preserve compliance, data integrity, auditability, and operational continuity.

The immediate priority is therefore **not to prescribe a single future technical solution or replace existing messages with an Order-based message**. It is to establish a common framework for further industry and government work, including:

- assessing how Offers and Orders may affect existing API, iAPI, PNR;
- defining the minimum information that must be available to the supplier or operating carrier;
- mapping required passenger data to future airline capabilities and source systems;
- preserving the distinct purposes, legal bases, and data protection safeguards applicable to different passenger data transfers;
- supporting interoperability among legacy, hybrid, and future environments; and
- determining whether existing transmission standards, interfaces, and governance arrangements need to evolve.

Through this framework, FOPD provides a **common basis for coordinated action** among airlines, governments, international organizations, retailers, suppliers, and technology providers. Its purpose is to enable the modernization of airline systems while maintaining **security, facilitation, privacy, compliance, and global interoperability**, and supporting a more seamless passenger experience.

1. Secure, Interoperable and Harmonized Global Passenger Data Standards

1.1. Context

International air transport continues to grow in scale and complexity. At the same time, the airline industry is transitioning to **modern airline retailing, built on Offers and Orders and increasingly supported by digital identity**. This evolution is transforming how passenger data is created, managed, and maintained. Rather than relying primarily on records captured at defined operational milestones, **passenger-related data is becoming increasingly dynamic** and may be updated or enriched throughout the travel lifecycle.

This evolution has implications beyond airline commercial and operational systems. Governments rely on travel document information, Advance Passenger Information (API), Interactive Advance Passenger Information (iAPI), and Passenger Name Record (PNR) data to support border security, risk assessment, law enforcement, border management, and passenger facilitation. As required data may originate from increasingly distributed and interconnected airline environments, governments and industry must work together to ensure that it remains available in a **secure, consistent, interoperable, and auditable manner**.

The transition to Offers and Orders also introduces an evolving relationship between the **retailer** that manages the customer's offer and the **supplier, including the operating carrier**, responsible for delivering the service. This may change **which party holds, controls, or can access specific passenger and Order data**. Further industry work is therefore required to determine the **minimum information that must be available to the supplier or operating carrier** to support applicable operational, security, facilitation, and regulatory obligations.

Existing passenger data sharing frameworks were developed primarily for airline environments characterized by **static record structures, established operational milestones, and batch-oriented transmission models**. While these frameworks have supported passenger data programmes for many years, the transition to Offers and Orders requires a reassessment of **how required passenger data is sourced, assembled, structured, transmitted, and governed**. The objective is not to change the underlying security, border management, law enforcement, or facilitation purposes for which passenger data is required, but to ensure that **applicable obligations continue to be fulfilled as airline systems and business relationships evolve**.

Many States conduct risk assessments at different stages of the travel process, including before travel, departure, and arrival. As passenger data becomes more dynamic and may be distributed across multiple airline systems and parties, **the right data must remain available to the appropriate authorities at the required time**, in accordance with applicable legal frameworks, operational requirements, and internationally agreed standards.

At the same time, existing passenger data transfers continue to be affected by **legacy technologies, batch-oriented processes, divergent interpretations of standards, and non-standard national requirements**. In an environment increasingly shaped by automated system-to-system processing, these limitations create operational inefficiencies, hinder interoperability, and make it more difficult to **trace and verify what passenger data was transferred, when it was transferred, and how applicable requirements were fulfilled**. They may also constrain timely operational decision-making by authorities in accordance with their respective passenger data programmes.

Increasing data protection requirements also demand **transparency, proportionality, data minimization, and security by design. Consistent data definitions and semantics are therefore critical**. The harmonization of travel document specifications under ICAO Doc 9303 illustrates the value of globally standardized semantics in improving data quality, reducing ambiguity, and enabling reliable automated processing across systems.

The purpose of this white paper is **not to replace existing legal obligations or internationally recognized principles**. It seeks to support an evolution that is **backward compatible, globally scalable, and aligned with security, border management, and facilitation objectives**. This will require coordinated action across airlines, governments, international organizations, retailers, suppliers, and technology providers. The opportunity is significant: **streamlined compliance, improved data quality, stronger risk-management outcomes, enhanced auditability, and a more seamless journey for legitimate travellers. Global interoperability is no longer an aspiration; it is a prerequisite** for the future of passenger data transfers and international air transport.

1.2. Challenges in the Current Passenger Data Landscape

1.2.1 Fragmentation of Standards and Implementations

Although API, iAPI, and PNR data standards are developed through the established ICAO, IATA, and WCO governance framework, including the WCO/IATA/ICAO Contact Committee, their implementation varies considerably between States. As these internationally agreed standards and guidance are implemented across diverse national legal, operational, and technical environments, differences in interpretation and implementation may emerge. These differences can result in non-standard data requirements and bespoke technical extensions. For the purposes of this paper, "non-standard requirements" refers to data elements, formats, validation rules, transmission practices, or other implementation requirements that are not aligned with applicable ICAO Standards and Recommended Practices or internationally agreed guidance developed through the WCO/IATA/ICAO Contact Committee.

This fragmentation results in inconsistent validation requirements and unclear operational practices across passenger data programs. It is not merely an implementation challenge; it directly undermines interoperability between airlines and governments. In accordance with ICAO Annex 9, Contracting States should not require non-standard data elements as part of API, iAPI, or PNR provisions. Where a State identifies an operational or regulatory need that is not addressed by the existing standards, the proposed change should be considered through the WCO/IATA/ICAO Contact Committee and the WCO Data Maintenance Request process. This enables additional requirements to be assessed and, where appropriate, incorporated into the international framework through coordinated review and endorsement. Divergence from these processes increases implementation complexity and compliance costs for airlines while reducing interoperability, data quality, and operational effectiveness for authorities.

As industry transitions toward Offers and Orders and increasingly automated passenger data environments, these inconsistencies must be addressed to prevent existing fragmentation from being replicated across future data models, interfaces, and exchange architectures.

1.2.2 Inconsistent Data Schemas, Quality, and Auditability

As passenger data frameworks evolve alongside modern airline retailing, data environments are expected to become more structured and less fragmented. However, the current landscape remains characterized by inconsistencies in how required passenger data is collected, defined, validated, and interpreted.

Variations arise primarily from differences in national requirements and implementation practices, including field definitions, conditional validation rules, acceptable formats, and transmission timing. While airlines are responsible for collecting and transmitting data, many inconsistencies originate from external requirements and divergent interpretations, reducing consistency across API and PNR data transfers. This degrades data quality and increases burden for both airlines and border control authorities.

Errors in passenger data transfers are not always traceable in case of dispute or reproducible in a controlled testing environment. This limits the ability of airlines and authorities to identify root causes, undermines

auditability, and creates accountability challenges, including exposure to penalties where issues cannot be systematically diagnosed or resolved.

These challenges are amplified as passenger data processing becomes increasingly automated. Reliability and interoperability depend not only on transmission formats, but also on consistent data semantics. Variability in how data attributes are represented or interpreted can lead to non-standard requirements, reduced data quality, weaker auditability, and inconsistent operational outcomes.

1.2.3 Legacy Technology Constraints

The UN/EDIFACT implementations of PAXLST and PNRGOV have provided a robust and widely implemented foundation for passenger data transfers. However, their structures were developed for an earlier generation of system architecture and can be less adaptable to modern, automated environments. Message constraints and the use of compact coded representations and abbreviations can increase implementation and interpretation complexity, particularly where the same data is interpreted or validated differently across jurisdictions. These characteristics can also make message parsing, troubleshooting, and integration with contemporary systems more complex.

As passenger data technologies evolve, modernization should be coordinated through internationally aligned standards, implementation guidance, and governance. Without such coordination, different technical approaches may emerge across jurisdictions, increasing integration complexity and replicating existing fragmentation in new technical forms.

1.2.4 Evolving Expectations Without Structural Alignment

Governments increasingly expect earlier, richer, and more granular passenger data to support risk-based border management, law enforcement, crisis response, including Public Health Emergencies of International Concern. These objectives are legitimate. However, current passenger data systems, which are largely based on batch processing and, in some cases, non-standard requirements implementations, were not designed to support these expanded expectations without extensive coordination and customization.

Proactively addressing this landscape will mitigate the risk of unilateral divergence, redundant reporting requirements, and inconsistent enforcement. Fragmented implementation approaches can result in airlines being required to provide substantially the same passenger data more than once within a jurisdiction, contrary to the ICAO Annex 9 objective of minimizing duplicate reporting obligations through coordinated passenger data collection mechanisms such as the Passenger Data Single Window. Such inefficiencies increase cost and complexity for airlines while undermining both security outcomes and facilitation objectives.

1.3. Objectives of a new Global Standards and Harmonization Framework

The objective of a new framework is to enable secure, lawful, auditable, and scalable transfers of passenger data from airlines to governments which is aligned with international standards and adaptable to future data models.

Specifically, the framework aims to:

- **Establish privacy-by-design** as a baseline requirement across all passenger data transfers.
- **Enable global interoperability** between airlines, and between airlines and States through harmonized standards, data models, interfaces, and document semantics.

- **Ensure technology-neutral legal compliance**, whereby passenger data obligations are defined by the required data and regulatory objectives rather than by a specific airline business record, enabling compliance whether the data originates from a PNR, an Order-related environment.
- **Reduce operational burden, duplication, and legal risk for airlines** by constraining unilateral divergence from international standards and improving clarity of regulatory requirements, data definitions, implementation guidance, and compliance obligations.
- **Enhance trust and cooperation across stakeholders through transparency**, shared governance, predictable change management, and auditability.
- **Support future-proofing capabilities**, including digital identity, biometrics, automated border processing, to continue to support lawful risk-based targeting.

While data transmission mechanisms may evolve, the purpose, sensitivity, and legal responsibilities associated with passenger data remain constant.

1.4. Core Principles for Secure and Interoperable Passenger Future Data Systems

1.4.1 Record-Agnostic Global Standards

Global standards must apply consistently regardless of the underlying commercial or operational record. Where passenger data is required for regulatory, security, or facilitation purposes, expectations for lawful use, accuracy, timeliness, protection, and accountability should apply irrespective of whether the data originates from a PNR, an Order.

Achieving this requires structured mapping between legacy and emerging data models to ensure that required passenger data elements are consistently defined, interpreted, validated, and transmitted across different record structures.

1.4.2 Interoperability by Design

Passenger data systems should be built using open, vendor neutral architectures that support standardized Application Programming Interfaces which consist of software interfaces that permit systems to exchange information in standard formats through defined rules and security controls, or protocols like AS4, a secure message-exchange protocol designed for reliable and auditable business-to-government and business-to-business data transmission, harmonized schemas, and clear mapping logic, or even REST API used along JSON-Schemas (to outline definition) with JSON format protocol.

Interoperability must extend across airlines and competent governmental authorities which receive and process passenger data through the PDSW, enabling reliable end-to-end data transfer and reducing duplication.

1.4.3 Security and Privacy Embedded Throughout the Lifecycle

Passenger data must be protected throughout its lifecycle, from collection, transmission, storage, processing, and access through retention and deletion. Encryption, authentication, authorization, audit logging, and incident response are baseline requirements for data protection. Privacy principles such as purpose limitation, proportionality, minimization, transparency, and redress must be embedded by design in the passenger data program itself.

States have legitimate requirements to obtain passenger data for border security, risk management, and facilitation. At the same time, these requirements must remain proportionate, clearly defined, and aligned with internationally agreed standards. While Orders may contain richer commercial and operational information than is currently available through passenger data programmes, access to and use of passenger data by

authorities should continue to be governed by a clear legal basis, defined purpose, proportionality, safeguards, and effective oversight.

1.4.4 Global Governance, Change Management, and Issue Resolution

A clear and functioning global governance model is required to manage standards evolution, versioning, implementation guidance, compliance monitoring, and issue resolution. This includes transparent change management processes, defined roles and responsibilities, structured consultation mechanisms, and escalation pathways. Continued collaboration, supported by coordinated governance and consistent implementation, will be essential to prevent existing fragmentation from being replicated across future technical models.

1.4.5 Legal frameworks and conflict of laws

States should align national legal frameworks with internationally recognized standards, minimizing conflict of national laws and enabling equivalent safeguards where appropriate. This alignment should support an appropriate balance between data protection principles, including data minimization, and States' legitimate security, border management, and facilitation requirements.

Alignment with ICAO Annex 9, relevant United Nations Security Council resolutions, ICAO Doc 9303, and internationally accepted data protection principles is essential to lawful cross-border transfers of passenger data from airlines to States.

1.4.6 Standardized Travel Document Semantics as a Foundation for Interoperability

As airlines and States increasingly rely on machine-to-machine decisioning across API, iAPI, PNR, Digital Travel Credentials, automated border clearance, and the ability to distinguish document types consistently, such as ordinary, diplomatic, official, or emergency documents, through the harmonization of the second character travel document type code, becomes essential. Standardized document codes governed by ICAO Doc 9303 improve data quality at source, reduce ambiguity, support lawful differentiation where required, and enhance auditability.

The ongoing harmonization of travel document definitions under ICAO Doc 9303 provides a globally coordinated reference framework for improving semantic consistency. While adoption timelines may vary across States, alignment with this framework is critical to reducing fragmentation and enabling reliable automated passenger data processing over time.

1.5. Value Chain – Benefits Analysis

Secure and interoperable passenger data exchange is more than a technical or regulatory objective; it is a strategic enabler of performance, resilience, trust and security across the air transport ecosystem.

1.5.1 Passenger Benefits

Harmonized implementation and application of standards enable a more seamless, predictable, and trusted journey. Early, reliable data supports advance admissibility decisions, faster processing, shorter queues, and increased use of automated and self-service channels. Privacy protection and proportional use of passenger data are embedded by design, ensuring strong protection of personal data alongside effective security.

1.5.2 Airline Benefits

For airlines, global alignment delivers operational clarity, reduced integration costs, and decreased compliance risk. Consistent application of standards improves data quality at source, streamlines check-in and boarding, and reduces costly errors and last-minute disruptions.

Clear and auditable rules; where passenger data requirements, validation logic, and transmission outcomes can be consistently traced and verified by both airlines and authorities. It strengthens compliance management and reduces uncertainty. This allows airlines to focus on customer experience.

1.5.3 State and Authority Benefits

Interoperable message standards enhance pre-departure risk assessment, enable targeted interventions, and improve coordination across border control, customs, immigration, and law enforcement functions. They can reduce the need for data transformation, improve scalability, strengthen governance and cybersecurity, and reinforce public confidence in government handling of passenger data.

1.5.4 Ecosystem Wide Value

The value proposition is collective and transformative: stronger security, lower complexity, improved efficiency, enhanced auditability, and a better passenger experience achieved simultaneously. Establishing secure and interoperable global standards is therefore a foundational investment in the future performance, legitimacy, and sustainability of international air transport.

1.6. From Global Standards to New Data Models

Today, passenger data required by governments is often sourced directly or indirectly from a Passenger Name Record (PNR), which acts as the airline's primary commercial and operational record. In an Offer and Order environment, the PNR is progressively replaced by an Order, where passenger, product, servicing, fulfilment, and payment information may be structured differently and distributed across multiple objects rather than contained within a single record. As a result, passenger data transfer mechanisms may need to evolve to ensure that governments continue to receive required API and PNR datasets in a consistent, interoperable, and legally compliant manner. However, it does not alter the underlying public policy objectives governing passenger data transfers. Governments will continue to require defined datasets for border security and facilitation purposes, irrespective of the airline's internal data model.

The global standards, interoperability principles, legal harmonization framework, and document-level consistency established in this section provide a stable anchor for the transition. They preserve continuity of regulatory intent, legal certainty, and operational trust while enabling innovation.

1.7. Scope Clarification and Forward Link

This section has defined what must remain globally consistent: security objectives, facilitation goals, governance principles, legal and systems interoperability, accountability for passenger data sharing, and standardized document semantics.

The following section, **Passenger Data Transitioning to Offers & Orders: Technical and Policy Pathways**, examines how these principles can be operationalized during the technical evolution from legacy PNR-based systems to Order-based architectures, including data mapping, coexistence strategies, and transition pathways.

Together, these sections provide a coherent roadmap from shared global governance to practical, technology-enabled transformation, ensuring continuity, compliance, and trust across the future passenger data ecosystem.

2. Passenger Data Transitioning to Offers & Orders: Technical and Policy Pathways

2.1. Context

The aviation industry is undergoing a profound transformation driven by the **transition to Modern Airline Retailing**. At the centre of this evolution is the **adoption of Offers and Orders**, which will progressively replace legacy reservation constructs and reshape how airlines create, manage, fulfil, and service travel products throughout the passenger journey. This represents the most significant change to airline commercial and operational systems since the transition from paper-based processes to digital airline operations.

At the same time, much of the global passenger data ecosystem continues to rely on messaging standards, transmission formats, and technical architectures developed several decades ago. While these frameworks have enabled the large-scale exchange of passenger data between airlines and public authorities, they were designed for an environment characterized by static records, batch processing, and legacy system architectures. As the industry advances toward more dynamic, interoperable, and digitally enabled operating models, **these legacy foundations present growing challenges for scalability, interoperability, data quality, and long-term sustainability**.

It is important to recognize that **PNRs and Orders are both airline business records that support commercial and operational processes**. Historically, the PNR has fulfilled this role within airline reservation environments. In the future, the Order will increasingly serve as the airline's primary commercial and operational record. While the structure and management of these records will evolve, **the passenger data required by governments will continue to exist within airline systems and must remain capable of being transmitted in a secure, consistent, and interoperable manner**.

The legal and regulatory frameworks governing States' passenger data requirements are also expected to remain substantially unchanged. **Current obligations relating to API, iAPI, and PNR data are established through national legislation and application of international standards. As airline systems transition toward Order-based environments**, these legal requirements will continue to apply, requiring mechanisms that preserve compliance, data protection, security, auditability, and operational continuity throughout the transition period.

The passenger data ecosystem already operates within a globally recognized governance framework jointly maintained by ICAO and through the WCO/IATA/ICAO Contact Committee. This framework provides the foundation for passenger data standards, transmission methodologies, implementation guidance, and technical specifications. However, **the challenge identified in this white paper is not the absence of governance, but the inconsistent interpretation and implementation of these standards across jurisdictions**. As new operating models emerge, maintaining global interoperability will depend on the continued evolution of these governance mechanisms, ensuring that standards remain harmonized, technology-neutral, and consistently implemented across jurisdictions.

The transition from PNR-based environments to Order-based data constructs will be gradual and will require **a prolonged period of coexistence across airlines, governments' border authorities, and technology providers**. During this period, legacy and modern systems will operate in parallel, requiring standardized mapping, translation capabilities, governance arrangements, and coordinated implementation approach to preserve continuity and avoid fragmentation.

This section examines the pathways required to enable a **secure, interoperable, and orderly transition** from PNR-based passenger data environments to future Order-based architectures. It explores legacy constraints, transition challenges, stakeholder impacts, and technical measures necessary to ensure that modernization

can be achieved while preserving compliance, security, privacy, facilitation objectives, and global interoperability.

2.2. Review of legacy Passenger Data systems and associated standards (PNRGOV, UN/EDIFACT)

PNR is the reservation record created in the reservation system of an airline or in a Global Distribution System (GDS), in which the booking of flights and services are registered and processed. It is an internal record created for the operational and commercial purposes of the airline, to ensure provision of air transport and services requested by the passengers while supporting different internal processes.

In the future, the Order will replace the PNR, serving the same needs and purposes. Like PNR, the Order will still be an internal, commercial and operational record.

With the new business logic defined in the Order, some of the elements will remain the same while others will have a new structure or will be replaced by new Order elements, e.g. Electronic Tickets (e-tickets) or Electronic Miscellaneous Documents (EMDs) which is an official IATA standard document to facilitate fulfilment of optional/ancillaries service.

PNRGOV is the standard message format for transmitting PNR data as defined by ICAO/IATA/WCO, providing the standardized government-facing mechanism for transmitting PNR data in accordance with internationally recognized guidance. This message format is maintained by a joint industry-government working group and is available in two formats: PNRGOV UN/EDIFACT and PNRGOV XML. These two message formats are aligned to transmit the same data. Both messages have several versions. The most widely implemented versions are 11.1, 13.1 and 15.1.

Similarly, API data is transmitted through the PAXLST (Passenger List) message standard, the internationally recognized passenger list message used by airlines to transmit API and crew data to border control authorities, which is available in both UN/EDIFACT, the long-established United Nations standard for structured electronic business message exchange, and XML formats and implemented through multiple versions. Together, PNRGOV and PAXLST have provided the foundation for global passenger data sharing for many years, enabling the standardized transmission of passenger information between airlines and government authorities.

As the industry transitions from PNR-based environments to Order-based architectures, these governance mechanisms will need to evolve alongside the technical standards to maintain interoperability, consistency and global harmonization throughout the transition period.

Crew data, which relates to the passport details of the crew members, needs to be looked at separately, since crew data management systems are not standardized as they are separate systems managed by the airlines individually using their own databases, having their processes and requirements.

2.3. Passenger Data in an Order-Based Environment: Mapping and Transition Considerations

The transition toward Offer and Order-based environments requires a clear understanding of how passenger data currently used for regulatory submissions is created, collected, structured, stored, and transmitted today, and how those data elements may be represented in future airline systems.

The future challenge is not simply to replace PAXLST or PNRGOV with a new message. Rather, it is to understand how the underlying airline source record from which passenger data is derived will evolve, and how

required regulatory data can continue to be provided consistently as airlines move from PNR-based to Order-based architectures.

A structured mapping exercise is therefore required to compare today's API and PNR data elements with their potential equivalents in an Order-based environment. This mapping should assess whether the data elements submitted today are present in the Order, whether they are represented in the same way, whether transformation is required, and whether certain elements may originate from different systems or no longer exist in their current form.

The mapping should not be limited to a technical comparison of field names. It should examine the business meaning of each data element, its source system, timing of availability, level of validation, applicable legal basis, data format, field length, code set, optionality, and transmission relevance. It should also distinguish between data required for regulatory purposes and additional commercial or operational data that may exist in Orders but should not automatically be considered in scope for government transmission.

2.3.1 Current API/iAPI data baseline

The PAXLST message used for API is primarily based on identity, travel-document, and flight information. Flight-related API data includes, for example, flight identification, scheduled departure and arrival dates and times, departure and arrival locations, subsequent ports of call, and the total number of passengers. Passenger and crew-related API data includes travel-document number, issuing State or organization, document type and expiry date, surname and given names, nationality, date of birth, and sex.

API and iAPI requirements apply independently of whether an airline manages its commercial relationship through a PNR, an Order, or another business construct. The identity, travel-document, and flight information required by governments must continue to be available and transmitted in accordance with applicable legal requirements, international standards, and operational timelines. Governments will continue to require information concerning who intends to travel or is travelling, the relevant flight, the travel document or documents associated with the journey, and whether the passenger is permitted to travel or is admissible.

For many airlines, API is currently assembled or transmitted through Departure Control System capabilities. The transition assessment should determine whether future retailing and Delivery environments affect the authoritative source, availability, timing, validation, or transmission of API-related information. It should also consider whether relevant identity attributes are held or referenced in Order-related or digital-identity capabilities and how provenance, validation status, timestamps, and document-verification evidence will be preserved.

The impact of Offers and Orders on API and iAPI may be more limited than the impact on PNR, but this should not be assumed. It should be validated through a focused assessment of process, data-source, access, timing, validation, and transmission implications.

Where the retailer and the supplier are different parties, the assessment should determine the minimum API-related information that must be available to the supplier, including the operating carrier, to maintain compliance with applicable government passenger-data programmes and other operational, security, and facilitation obligations.

2.3.2 Current PNR data baseline

PNR data requires a more detailed mapping exercise than API and iAPI data. Whereas API and iAPI primarily concern identity, travel-document, and flight information collected for regulatory purposes, a PNR is a commercial and operational reservation record created by an airline or its authorized agents. The amount and nature of the information held in a PNR may vary between airlines, passengers, booking channels, and servicing

arrangements. Its completeness and verification status may also vary because it can include information provided during booking and servicing.

PNR data may include name and address details, contact telephone numbers, collected API data, frequent-flyer information, the PNR locator, the number of passengers in the PNR, passenger and travel-status information, date information, split or divided PNR information, ticketing information, the complete itinerary, form-of-payment information, check-in information, seat and baggage information, travel-agent and received-from information, go-show and no-show indicators, general remarks, and coded or free-text fields such as OSI, SSR, SSI, remarks, and history. The presence of an individual element depends on the applicable process, airline environment, booking channel, and information made available to the relevant system.

PNRGOV should not be understood as the direct transmission of a single, standardized airline record. Depending on the airline's architecture, operational processes, and applicable State requirements, the transmitted dataset may be assembled from reservation, distribution, departure-control, servicing, payment, partner, and other operational systems.

The transition to Orders is therefore expected to have a significant impact on PNR programs. Some information currently transmitted through PNRGOV may have an equivalent in an Order-based environment, but it may be represented differently, require transformation, originate from another airline capability, or remain outside the Order. Relevant information may be distributed across Order objects, Order items, services, fulfilment records, payment records, customer profiles, distribution records, servicing history, and other operational systems.

A comparable record-agnostic approach will be required in an Offer and Order environment. The relevant consideration is not whether all required information is held within a single Order, but whether passenger data required for regulatory transmission remains available, complete, correctly interpreted, validated as appropriate, and capable of being assembled and transmitted through the applicable government-facing mechanism.

The transition also introduces an evolving relationship between the retailer and the supplier, including the operating carrier. This relationship may change which party holds, controls, amends, or can access specific passenger and Order data. Where the supplier or operating carrier is not the retailer, it should not be assumed that it will automatically have access to all information held by the retailer. Further industry work is required to determine the minimum information that must be available to the supplier or operating carrier, together with the necessary access, mapping, validation, and governance arrangements, to support applicable operational, security, facilitation, API, PNR, and other regulatory obligations.

The analysis should not assume that an Order is itself a government transmission message or that all information associated with an Order should be transmitted to States. Regulatory transmissions must continue to be based on applicable legal requirements, defined purposes, relevant international standards, proportionality, data minimization, and appropriate data-protection safeguards.

2.3.3 Data availability and mapping considerations

A definitive comparison of API, PNR and Order data coverage cannot yet be provided. PAXLST and PNRGOV are government-facing message standards, while PNR and Order are airline business constructs whose implementation and underlying source systems may vary between airlines. An Order should therefore not be compared directly with PAXLST or PNRGOV as if they were equivalent structures.

PNRGOV should not be understood as the direct transmission of a single, monolithic airline record. Required passenger data may be assembled from reservation, distribution, departure control, servicing, payment, partner and other operational systems. The presence, source and timing of individual data elements may depend on the airline's processes, system architecture, booking and servicing arrangements, and the stage of the journey at which the information is created or updated.

A comparable record-agnostic approach will be required in an Offer and Order environment. Some information currently provided through API, iAPI and PNR programs may be represented differently, may require transformation, or may continue to originate outside the Order. The internal location of the information is secondary to ensuring that required passenger data remains available, complete, correctly mapped and capable of being provided through the applicable government-facing format.

The emerging supplier and retailer relationship introduces an additional data-availability issue. Where the supplier or operating carrier is not the retailer, it may not automatically hold or control all passenger and Order data associated with the journey. Further industry work is required to define the minimum information that must be available to the supplier or operating carrier, together with the necessary access, mapping, validation and governance arrangements, to ensure continued compliance with API, PNR and other applicable government reporting requirements.

This work must also consider that the existence of information within an Order-related environment does not, by itself, establish that it should be transmitted to governments. Conversely, the supplier's Order-related environment may contain less information than the retailer's environment. Regulatory transmissions must remain based on applicable legal requirements, defined purposes, relevant international standards, proportionality and appropriate data-protection safeguards.

Note: In future Delivery-based operating models, the traditional concept of passenger check-in may evolve. Concepts such as "Intention to Fly" are being explored in relation to passenger acceptance at specific journey touchpoints. As these concepts mature through the relevant industry processes, information currently associated with check-in may be represented differently in future systems. This does not alter the need to provide required operational and regulatory information at the applicable time.

2.3.4 Interface points and source-system considerations

Passenger data does not originate from a single airline system. The airline environment includes Passenger Service System providers, message brokers, travel agents, Global Distribution Systems, codeshare and interline partners, websites, mobile applications, self-service platforms, ground handling systems, Departure Control Systems, crew management systems, and service providers.

A future Order-to-government transmission model cannot therefore be designed only as a data-format exercise. It must identify the relevant interface points across the airline ecosystem and determine whether data is created, collected, updated, or validated in the Order Management System, airline DCS, customer profile, payment system, loyalty system, distribution channel, servicing platform, or partner airline system. This will be particularly important for interline and codeshare scenarios, where data visibility and operational responsibility may differ between operating and marketing carriers.

2.3.5 Technical format and coexistence implications

Current passenger data transmissions rely on established standards and messages, including PAXLST, CUSRES, PNRGOV, GOVREQ and ACKRES. At the same time, airline data exchange standards are evolving from legacy technologies, including teletype and EDIFACT, toward XML, JSON, and more modern system-to-system interfaces.

The mapping should support two related objectives. First, it should enable translation during the coexistence period, so that airlines operating Order-based systems can continue to meet current legal obligations, providing PNRGOV messages where authorities are not yet ready to receive a future Order-based format. Second, it should accommodate the design of any future passenger data transmission model that may use modern data formats and interfaces while remaining aligned with global governance, legal requirements, and operational capabilities.

During the coexistence period, mapping or transformation mechanisms may be required where airline source environments and government receiving capabilities use different data structures, formats, or semantics. Such mechanisms can support continuity, but they may also introduce risks where required information is unavailable, represented differently, or created at a different stage of the journey. This reinforces the need for standardized mapping rules, common interpretation guidance, validation mechanisms, and appropriate governance rather than proprietary or ad hoc transformation logic.

2.3.6 Further analysis and governance pathway

Further coordinated analysis is required to determine how passenger data currently required for API, iAPI, PNR, and other applicable government programs will remain available as airline commercial and operational environments evolve. This work should build on existing passenger-data standards and governance arrangements and bring together airlines, governments, passenger-data experts, Offer and Order standards experts, technology providers, and the relevant standards groups. Any proposed evolution affecting government passenger-data requirements, transmission standards, or implementation arrangements should be developed and assessed with States and competent authorities through the established international governance processes.

The analysis should consider the business meaning, source, availability, timing, validation status, and regulatory relevance of each required passenger-data element, together with any mapping or transformation needed for regulatory transmission. It should not be limited to a technical comparison of PNR and Order fields but should support a record-agnostic approach by identifying which required elements remain unchanged, which are represented differently, which originate from different airline capabilities or source systems, and which may no longer be available in their current form.

The work should explicitly address the evolving relationship between the retailer and the supplier, including the operating carrier. Where the supplier or operating carrier is not the retailer, it should not be assumed that it will automatically have access to all information held by the retailer. The overarching principles, responsibilities, and data flows needed to support the operating carrier's passenger-data obligations should therefore be defined, including where the retailer, marketing carrier, and operating carrier are different parties. The analysis should determine the minimum information that must be available to the supplier or operating carrier, together with the necessary access, mapping, validation, timeliness, and governance arrangements, to fulfil applicable operational, security, facilitation, API, PNR, and other regulatory obligations. The scope should include interline and codeshare journeys and changes made to an Order after its creation, where data may be held, controlled, or amended by different parties. It should be coordinated with the relevant Offers and Orders governance activities responsible for defining supplier-order and customer-admissibility business requirements.

It is important to note that the analysis should not assume that an Order itself is a government transmission message or that all information associated with an Order falls within the scope of government passenger-data transmission. Regulatory transfers must continue to be based on applicable legal requirements, defined purposes, relevant international standards, proportionality, data minimization, and appropriate data-protection safeguards.

2.4. Stakeholder impact analysis (airlines, governments, IT providers)

Passenger data transfer involves a broad ecosystem of stakeholders, including airlines, governments, technology providers, retailers, and passengers. Within this ecosystem, airlines and governments play the principal operational roles as the primary providers and recipients of passenger data. As a result, they are the primary focus of the impact analysis presented in this section.

The objective of this analysis is to assess the current passenger data environment by examining the benefits it delivers and the challenges it creates for key stakeholders. It also considers how the industry's transition toward Offers and Orders may affect existing processes, creating opportunities to improve interoperability, efficiency, security, data quality, and operational effectiveness while introducing new technical, governance, and implementation considerations.

Current passenger data frameworks provide a mature and globally implemented foundation, supported by established standards, governance structures, and operational practices. However, many of the underlying technical architectures, messaging standards, and implementation models were designed for an earlier generation of airline systems and are becoming increasingly difficult to align with modern retailing, Offers and Orders, and increasingly dynamic passenger data environments.

Understanding both the strengths and limitations of this environment is essential to identifying the requirements for a successful transition toward future passenger data models. The analysis therefore begins with airlines, as the primary originators of passenger data within the ecosystem.

2.4.1 Airlines

2.4.1.1 Strengths of the current environment for airlines

- Airlines have made significant investments in establishing API and PNR data capabilities based on globally recognized standards and guidance developed by ICAO, IATA, and WCO. These capabilities include mature processes for the collection, protection, storage, and transmission of passenger data and currently support more than 110 State API programmes (including more than 20 iAPI implementations) and over 75 State PNR programmes worldwide. Additional States continue to develop and deploy API and PNR regimes.
- Interactive Advance Passenger Information (iAPI) provides a two-way communication mechanism that enables airlines to receive boarding directives from authorities prior to departure. This capability supports regulatory compliance, reduces operational uncertainty, and helps minimize costs associated with the transport and return of inadmissible passengers.
- Passenger Data Single Window (PDSW) implementations, which enable carriers to meet multiple passenger-data transmission obligations through a single government submission channel, provide a standardized point of entry for passenger data submissions, enabling airlines to fulfil multiple regulatory reporting obligations through a single interface and reducing operational complexity within participating jurisdictions.

2.4.1.2 Challenges for airlines in the current environment

- Airlines have invested significantly in establishing and maintaining API, iAPI, and PNR capabilities. While these programmes have delivered long-term operational value, they require substantial implementation effort and ongoing costs associated with system maintenance, connectivity, compliance, and data transmission.
- Divergence from internationally recognized standards, including non-standard data requirements, additional transmission obligations, and jurisdiction-specific implementation approaches, increases operational complexity and compliance costs for airlines.
- Variations in national requirements, data definitions, validation rules, and implementation practices reduce interoperability and require airlines to maintain multiple technical solutions to meet similar regulatory obligations across jurisdictions.
- Fragmentation across national passenger data regimes creates uncertainty and limits the ability to implement globally harmonized processes, reducing operational efficiency and increasing administrative burden.
- Penalty frameworks that do not adequately account for implementation challenges, data quality issues outside airline control, such as passenger data elements that are not available in the machine-readable zone (MRZ) of travel documents, inaccurate, incomplete, or unverifiable passenger-supplied information,

or conflicting regulatory requirements may expose airlines to increased compliance risk and financial costs.

2.4.2 Governments

2.4.2.1 Strengths of the current environment for governments

- International standards supported by best practices and guidance materials.
- Well established working relationships with airlines
- Existing systems are well set up to operate existing technical standards

2.4.2.2 Challenges for governments in the current environment

- Data quality and consistency remain ongoing challenges. Variations in national requirements, fragmented implementation of standards, manual data collection processes, and inconsistent data semantics can reduce the reliability, comparability, and auditability of passenger data, creating additional analytical and operational burdens for authorities.
- Legacy technology constraints continue to affect passenger data processing. Continued reliance on older messaging formats (EDIFACT for PAXLST and PNRGOV, including PNRGOV binding in XML) and architectures can increase maintenance requirements, limit scalability, and delay the adoption of modern, interoperable, and secure data exchange capabilities.
- Information latency associated with batch transmission models can limit real-time situational awareness and reduce the effectiveness of time-sensitive risk assessment and operational decision-making processes. This issue has been partially addressed with iAPI.
- The need for appropriate legal frameworks, including bilateral or multilateral agreements where required, to facilitate cross-border passenger data transfers in compliance with applicable data protection laws, including the European Union General Data Protection Regulation (GDPR).

2.4.3 Technology Providers

2.4.3.1 Strengths of the current environment for technology providers

- Extensive experience supporting API, iAPI, PNR and border management programs across multiple jurisdictions.
- Established connectivity frameworks between airlines, governments, airports, and other industry stakeholders.
- Strong technical expertise in passenger data transmission, security, interoperability, and compliance requirements.
- Experience supporting large-scale implementations and operational continuity across global networks.

2.4.3.2 Challenges for technology providers in the current environment

- Fragmentation of national passenger data requirements and non-standard requirements increase implementation complexity and maintenance costs.
- Continued support for multiple message formats, transmission protocols, and jurisdiction-specific interfaces creates operational inefficiencies.
- Legacy architectures constrain innovation and increase the complexity of integrating modern technologies and digital identity capabilities.
- Maintaining interoperability across airlines, governments, airports, distribution channels, and service providers requires significant coordination.

2.4.4 Distribution and Retail Ecosystem Participants

Distribution and retail ecosystem participants, including Global Distribution Systems (GDSs), online travel agencies (OTAs), travel management companies (TMCs), accredited travel agents, aggregators, and other

sellers, play an important role in the passenger data ecosystem. In many cases, they represent an early point at which passenger information is collected, amended, or transmitted into airline systems.

Today, and as the industry transitions toward Modern Airline Retailing and Offer and Order-based architectures, passenger data quality depends significantly on the quality of information captured at source. Distribution and retail participants therefore have an important role in supporting standardized data collection, validation, and transmission processes across the travel ecosystem.

The transition may also change which parties collect, hold, amend, control, or can access specific passenger and Order data. Where the retailer and the supplier, including the operating carrier, are different parties, effective information exchange will be necessary to ensure that the supplier has access to the minimum information required to fulfil applicable operational, security, facilitation, API, PNR, and other regulatory obligations. Further industry work is required to define these minimum information and access requirements.

Digital Identity and One ID capabilities may strengthen these practices by enabling passengers to share trusted identity attributes and verified credentials during shopping, booking, and servicing. This creates opportunities to improve data quality, reduce manual data entry, and support the appropriate reuse of verified information throughout the passenger journey.

While regulatory passenger data submission obligations generally rest with the aircraft operator designated under applicable national law, improving data quality and interoperability requires alignment among all participants involved in collecting, managing, amending, and exchanging passenger information.

2.4.4.1 Airports, Ground Handlers, and operational service providers

Airports, authorized ground handlers, and other operational service providers may need to act on passenger-data or admissibility outcomes at key journey touchpoints, including check-in, security access, and boarding. Future work should therefore assess how relevant decisions and status information are communicated securely and in a timely manner, particularly where a data discrepancy, servicing change, or system outage requires operational intervention.
The future framework should also support transparency and effective resolution for passengers. This includes establishing how passengers can be informed of relevant data issues, correct inaccurate information through the appropriate responsible party, and obtain timely review or redress where an automated process affects their ability to travel. Any such arrangements must respect defined responsibilities, lawful access, data minimization, and applicable privacy and data-protection requirements.

2.4.5 Data quality as a shared ecosystem challenge

Data quality is a shared ecosystem challenge that extends beyond airlines and governments to include technology providers, distribution intermediaries, travel sellers, and other participants involved in the collection, management, verification, and exchange of passenger information. Passenger data may be updated and transmitted through multiple systems and organizations throughout the travel lifecycle, creating challenges arising from fragmented requirements, inconsistent implementation of standards, heterogeneous data sources, manual data collection processes, legacy system constraints, and differing operational objectives across stakeholders.

Improving passenger data quality ultimately requires improving data quality at source through better data acquisition practices and the increased use of machine-readable data capture, reducing reliance on the manual transcription of passenger information. As passenger information is frequently collected through multiple

channels before reaching airline systems or government authorities, standardized data capture, validation, and verification processes are critical to ensuring consistency and reliability across the ecosystem.

API and PNR data serve different purposes and therefore exhibit different quality characteristics. API data, which is Passport Data, is collected to satisfy regulatory requirements and must be captured and transmitted accurately by airlines. PNR data, by contrast, is an airline business record created to support commercial and operational processes. As a result, quality expectations, collection methods, and usage differ significantly between the two datasets.

The transition to Order-based environments creates an opportunity to improve data quality, consistency, and auditability. Combined with harmonized standards, effective governance, and digital identity capabilities, future passenger data frameworks can support higher-quality data exchange by enabling trusted identity attributes to be captured, verified, and reused throughout the passenger journey. Realizing these benefits, however, will depend on common data definitions, interoperable standards, and consistent implementation across industry and governments.

2.4.6 Opportunities through the transition to Order-based environments

The transition toward Order-based airline systems, combined with modern transmission standards, digital identity capabilities, and strengthened governance, creates opportunities to address many of the structural challenges identified above.

- Greater interoperability between airlines and between airlines and governments through harmonized data models, interfaces, and transmission standards.
- Improved data quality and auditability through stronger data governance and greater alignment of definitions and implementation practices.
- Reduced dependence on legacy technologies.
- Greater architectural flexibility and operational resilience.
- Enhanced interoperability among border-control, customs, immigration, and law-enforcement authorities, including through Passenger Data Single Window implementations.
- Improved identity verification through digital identity capabilities and trusted data sources.
- More efficient implementation and change management through global standards, clear governance, and coordinated stakeholder engagement.
- Continuity of regulatory and operational capabilities throughout the transition from PNR-based to Order-based environments.

2.5. Regulatory Alignment, Legal Frameworks and Policy Recommendations

Passenger data transmission is not primarily a technology issue. It is grounded in public policy objectives established through national legislation, international obligations, and globally recognized standards that support border security, risk-based decision-making, law enforcement cooperation, and the facilitation of legitimate travel.

The legal foundation for passenger data programmes is well established. National laws requiring API, iAPI, and PNR data are informed by, and where applicable, give effect to international obligations and standards, including ICAO Annex 9 and relevant United Nations Security Council Resolutions relating to border security and counterterrorism.

These objectives are emphasized through the following United Nations Security Council Resolution (UNSCR):

- **UNSCR 2178 (2014)** called upon Member States to require that airlines operating in their territories provide Advance Passenger Information (API) to the appropriate national authorities to detect the departure from their territories, or attempted entry into or transit through their territories, by means of civil aircraft.
- **UNSCR 2309 (2016)** called upon Member States to require that airlines operating in their territories provide Advance Passenger Information (API) to the appropriate national authorities to detect the departure from their territories, or attempted entry into or transit through their territories, by means of civil aircraft.
- **UNSCR 2368 (2017)** has reaffirmed its call upon Member States in resolution 2178 (2014) to require that airlines operating in their territories provide advance passenger information to the appropriate national authorities.
  This UNSCR also called upon Member States to develop the capability to process Passenger Name Records (PNR) data and to ensure PNR data is used by the relevant national competent authorities, with full respect for human rights and fundamental freedoms for the purpose of preventing, detecting and investigating terrorist offenses, and encourages Member States to require that, where appropriate, airlines under their jurisdiction provide PNR to their relevant national authorities.
- **UNSCR 2396 (2017)** decided that Member States shall require airlines operating in their territories to provide API and shall develop the capability to collect, process and analyse PNR data to counter terrorism and terrorist travel, supported by international cooperation, technical assistance, and ICAO-led standards for passenger data.
- **UNSCR 2482 (2019)** has reiterated the call on Member States to implement API and PNR capabilities and share relevant data with competent authorities in accordance with ICAO standards and human rights obligations. It recognizes the role of API and PNR data in identifying links between terrorism and organized crime, whether domestic or transnational, and supporting efforts to prevent terrorist travel and prosecute related offences.
  Together, these resolutions have become key international policy drivers behind the global expansion of national passenger data programmes underpinned by the development of national legal frameworks governing passenger data collection, processing, and transmission.

As the airline industry transitions from PNR to Offers and Orders, these public policy objectives remain unchanged. States will continue to require passenger data to fulfil sovereign responsibilities relating to security, border management, and facilitation. What will change is the underlying airline business environment from which that data is sourced.

The Future of Passenger Data therefore requires a policy framework that is technology-neutral and record-agnostic. Regulatory obligations should be defined by the passenger data required to achieve legitimate governmental objectives rather than by the specific airline record structure in which that data resides. Whether the data originates from a PNR, an Order, or a future commercial construct, regulatory requirements should remain consistent, predictable, and interoperable.

At the same time, privacy and data protection considerations will remain fundamental. Passenger data programmes must continue to operate within applicable national and regional legal frameworks, including the General Data Protection Regulation (GDPR) and comparable legislation globally. As passenger data ecosystems evolve, maintaining an appropriate balance between data protection principles and legitimate security, border management, and facilitation requirements will remain an essential policy consideration.

2.5.1 Technology-neutral regulation

Passenger data legislation should define the information required, the lawful purposes for which it may be used, the responsible parties, the applicable safeguards, and accountability requirements. These obligations should, as far as practicable, remain independent of a particular airline's commercial record, internal system architecture, or proprietary implementation.

States may prescribe the form and way passenger data must be provided, including applicable technical formats, transmission protocols, and interfaces. Such requirements should use internationally recognized standards and implementation guidance developed and maintained through coordinated airline-government governance. Where multiple internationally maintained implementations are available, implementation choices should be agreed between the competent authorities and affected aircraft operators, taking account of interoperability, operational capability, transition arrangements, and efficient global compliance.

This record-agnostic approach is particularly important as industry transitions to Offer and Order-based environments. The emerging supplier and retailer relationship may change which party holds, controls, or can access passenger and Order data. Further industry work is required to determine the minimum information that must be available to the supplier, including the operating carrier, so that API, PNR, and other applicable operational, security, facilitation, and regulatory obligations can continue to be fulfilled.

2.5.2 Passenger Data compliance

Governments and industry should collaborate to ensure that passenger data obligations can continue to be fulfilled throughout the transition from legacy PNR-based environments to future Order-based architectures. During this period, airlines, authorities, and technology providers are expected to operate a combination of legacy, hybrid, and Order-based environments. Managing this coexistence will require coordinated implementation, common standards, and agreed transition mechanisms to preserve regulatory compliance, interoperability, and operational continuity.

2.5.3 Global interoperability through common standards

Governments and industry should continue to support internationally recognized passenger-data frameworks developed through ICAO, WCO, and IATA governance processes. Harmonized implementation of these frameworks remains critical to reducing cost, complexity, duplication, and fragmentation for both aircraft operators and authorities.

The current passenger data framework comprises several complementary components:

- **International Standards and Recommended Practices:** ICAO Annex 9, Facilitation, establishes provisions applicable to passenger-data exchange systems, including API, iAPI, PNR, the use of internationally recognized standards, and the minimization of duplicate reporting and operational burdens.
- **International guidance and best practices:** these include the WCO/IATA/ICAO Guidelines on Advance Passenger Information, the WCO/IATA/ICAO guidance for interactive API, and ICAO Doc 9944, Guidelines on Passenger Name Record Data.
- **Government-facing message standards:** API data is transmitted using internationally recognized PAXLST specifications, together with the applicable response messages for interactive programs. PNR data is transmitted using PNRGOV specifications. These standards are implemented through internationally maintained technical formats and versions, including UN/EDIFACT and XML implementations where applicable.
- **Best practices and guidelines:** implementation best-practices and guidelines, and best-practice like Interactive Advance Passenger Information (iAPI) Best Practice – 2024.
- **Passenger Data Single Window:** the PDSW provides a coordinated national submission point through which aircraft operators can provide passenger data to the competent authorities designated under the applicable national legal framework. Its purpose is to reduce duplicative reporting, and the number of times the same passenger data must be transmitted. The authorities that receive, process, or access the data, and the role of any Passenger Information Unit, depend on the State's legal and institutional arrangements.

- **Legal and data-protection frameworks:** national legislation, applicable privacy requirements, lawful-purpose limitations, safeguards, accountability, and international obligations govern the collection, transfer, access, use, retention, and protection of passenger data.

Together, these components provide the legal, policy, functional, technical, and governance foundation for passenger-data transfers today. The immediate objective of the Future of Passenger Data initiative is not to replace this foundation, but to determine how it should be maintained and, where necessary, evolved as airline commercial and operational environments transition toward Offers and Orders.

The transition may change which party holds, controls, or can access passenger and Order data. Where the retailer and the supplier, including the operating carrier, are different parties, further industry work is required to define the minimum information that must be available to the supplier to fulfil applicable API, PNR, security, facilitation, and other regulatory obligations. Common government-facing standards and harmonized implementation will remain necessary regardless of the airline capability from which the required information is sourced.

2.5.4 Data Privacy, proportionality and trust

Future passenger data frameworks must continue to incorporate principles of purpose limitation, proportionality, data quality, accountability, and appropriate safeguards, and incorporating data protection by design. Trust between governments, industry, and passengers remains a prerequisite for sustainable data-sharing frameworks.

2.5.5 Coordinated governance of the transition

The transition of passenger-data capabilities to Offer and Order-based environments should be coordinated through existing international governance structures with the WCO/IATA/ICAO Contact Committee. The scope of work should include assessing how Offers and Orders may affect API, iAPI, PNR, and other applicable State passenger-data requirements. It should also include mapping required passenger data to future airline capabilities and source systems and determining whether existing transmission standards, interfaces, implementation guidance, or governance arrangements need to evolve.

PNR-to-Order analysis will be an important component of this work because PNR is a commercial and operational business record whose role may be replaced or transformed in an Offer and Order environment. The analysis should determine how information currently provided through PNR programs will remain available, including where its structure, semantics, source, timing, or validation status changes. It should not assume that an Order is a government transmission message or that all information associated with an Order should be transmitted to governments.

API and iAPI should remain within the scope of the transition assessment, while continuing to be treated as distinct passenger-data programs with their own purposes, legal bases, processes, and transmission requirements. Their inclusion does not imply that API or iAPI are part of the PNR-to-Order mapping. Rather, the assessment should confirm that required identity, travel-document, and flight information remains available and capable of being transmitted in accordance with applicable requirements as airline commercial, retailing, and Delivery environments evolve.

A robust governance framework already exists to support this work. International legal instruments, data-protection frameworks, ICAO Standards and Recommended Practices, WCO/IATA/ICAO guidance, Passenger Data Single Window principles, and existing API and PNR technical standards collectively provide the foundation for future passenger-data solutions. The objective is not to replace these foundations, but to determine how they should be maintained and, where necessary, evolved for Offer and Order-based environments.

The transition also introduces an evolving relationship between the retailer and the supplier, including the operating carrier. This relationship may change which party holds, controls, or can access passenger and Order data. Further industry work is required to define the minimum information that must be available to the supplier or operating carrier, together with the necessary access, mapping, validation, and governance arrangements, to ensure continued compliance with API, PNR, security, facilitation, and other applicable regulatory obligations.

This coordinated work should preserve regulatory compliance, security, facilitation, privacy, interoperability, auditability, and global consistency while PNR-based, Order-based, and hybrid airline environments coexist.

2.6. Transition Dependencies and Implementation Considerations

The transition from PNR-based passenger data environments to Offer and Order-based architectures will not occur through a single industry-wide implementation programme. Airlines, governments, Passenger

Information Units (PIUs), the governmental entities responsible for receiving, processing, and analysing passenger data for border security and law-enforcement purposes, and technology providers will modernize at different speeds and according to their own operational, technical, and regulatory constraints.

For this reason, the transition should be viewed as a technology transformation that will require the coexistence of legacy and future data formats and systems for an extended period. During this time, mechanisms will be required to preserve regulatory compliance, interoperability, and operational continuity.

2.6.1 Order-based passenger data coexistence scenarios

The transition to Offer and Order-based environments will not occur uniformly across airlines, authorities, or technology providers. A phased approach will therefore be required to accommodate different airline architectures, implementation paths, and levels of readiness across the passenger-data ecosystem.

Passenger-data submissions should not be understood as originating from a single standardized PNR, API, or Order record. Depending on the airline's architecture, operational processes, and applicable State requirements, the information required for API, iAPI, and PNR programs may be assembled from reservation, distribution, departure-control, servicing, payment, partner, Order-related, and other operational capabilities. These source arrangements differ between airlines and may continue to evolve as Offers, Orders, and Delivery capabilities are introduced.

During the transition, PNR-based, Order-related, and hybrid airline environments will coexist. Authorities may also modernize at different rates, with some continuing to receive current passenger-data messages while others may, subject to future international agreement and implementation decisions, support evolved standards or interfaces. An airline may consequently need to support different configurations according to its own environment, its partners, and the capabilities and legal requirements of the States to which it operates.

In the initial phases, existing passenger-data processes and government-facing messages will continue to support compliance. As Order-related capabilities are introduced, airlines may need to assemble required information from a combination of existing and new source systems. Where the representation, source, or availability of information changes, mapping or transformation may be required so that existing API, iAPI, and PNR obligations continue to be fulfilled.

Over an extended coexistence period, current and evolved passenger-data mechanisms may operate in parallel. This will require consistent semantics, validation, version management, routing, traceability, auditability, and appropriate implementation guidance. Any future passenger-data standards or interfaces should be introduced only after their scope, required datasets, business rules, safeguards, and governance arrangements have been agreed through the appropriate international processes.

This phased approach is not intended to prescribe a common sequence, timeline, or target architecture for every airline or authority. Its purpose is to ensure that interoperability and regulatory continuity are maintained while airline source environments and authority receiving capabilities evolve at different rates. Required passenger data must remain available, correctly interpreted, validated, and capable of being transmitted through the applicable government-facing mechanism throughout the transition.

The emerging retailer and supplier relationship introduces an additional dependency across all phases. Where the operating carrier is the supplier but not the retailer, it may not automatically hold or control all information associated with the passenger's journey. Further industry work is required to define the minimum information that must be available to the supplier or operating carrier, together with the necessary access, mapping, validation, and governance arrangements, to support applicable operational, security, facilitation, API, PNR, and other regulatory obligations.

2.6.1.1 Key dependencies

Several foundational activities will be required before large-scale implementation can occur.

2.6.1.1.1. Future transmission standards

A future passenger data transmission model capable of supporting Order-related data exchanges will also need to be defined.

This work should address:

- message structure;
- business rules;
- semantics;
- implementation guidance;
- governance arrangements.

The objective should be to support modern, interoperable data exchanges while maintaining continuity with existing regulatory requirements.

2.6.1.1.2. Translation and interoperability mechanisms

During coexistence, translation capabilities will likely be required when airlines and authorities operate in different technological environments.

Translation mechanisms may support continuity; however, they also introduce risks where data models, business semantics, or timing differ between source and target environments.

Consequently, standardization of mapping and translation approaches will be important to avoid fragmentation and inconsistent interpretations across jurisdictions.

2.6.1.2 Strategic summary

The industry's immediate challenge is not the deployment of a new passenger data transmission standard but the creation of a common framework that enables interoperability between legacy and future environments.

Priority should therefore be given to:

1. mapping current passenger data requirements to Order environments;
2. defining interoperability principles;
3. assessing future transmission requirements;
4. maintaining alignment through existing international governance frameworks.

These activities will create the foundation required for any future transition from PNR-based passenger data exchanges to a fully interoperable Order-based environment.

3. Operationalizing the Future of Passenger Data

3.1. From Principles to Implementation

Sections 1 and 2 establish the need for globally aligned passenger-data standards and outline the technical and policy pathways for the transition from PNR-based environments to Order-based architectures. The next step is to translate these principles and pathways into coordinated industry and government action.

The Future of Passenger Data (FOPD) is a core element of the industry's transition toward Offers and Orders, helping industry and governments manage the implications of evolving airline business records on passenger data transfers, regulatory compliance, and international interoperability. This transformation is supported by IATA Recommended Practice 1786a (see Figure 5.1 in Annex 5), which provides the industry's common business framework for Modern Airline Retailing. As airlines progressively adopt Offer and Order-based business capabilities, passenger data standards, governance mechanisms, and regulatory reporting frameworks must evolve in a coordinated manner to ensure interoperability between retailing transformation and facilitation requirements.

Delivering this transformation requires alignment across three interdependent domains:

- **Airline commercial and operational systems** evolving toward Offers and Orders
- **Passenger data transmission frameworks** evolving beyond legacy message formats and systems
- **Digital identity and trust frameworks** that improve passenger data quality, and verification across the passenger journey

The central challenge is therefore not the absence of standards, but the complexity of implementation, across these domains.

This challenge will need to be addressed as the aviation sector is moving towards Digital identity and automated processing capabilities that will reshape how passenger data is sourced and verified.

3.2. Establishing Record-Agnostic Data Transfer

A foundational principle of future passenger data is that passenger data obligations are operationally linked to airline booking and departure control systems, as these systems are the primary source of passenger information. The intent of the statement is not to separate obligations from the underlying data sources, but rather to emphasize that regulatory requirements should remain technology-neutral and should not be tied to a specific airline system architecture or implementation approach.

Whether data originates from a PNR, DCS records or an Order, or a successor construct, it must be capable of being provided consistently and reliably.

To operationalize this principle, a structured approach is required:

- **Formalized data mapping** between PNR and Order structures to ensure continuity of required datasets.
- **Standardized definitions of passenger data elements** independent of execution context.
- **Controlled translation mechanisms** during the coexistence period.

During coexistence, airlines may need controlled mapping or transformation capabilities to assemble required passenger data from evolving source systems and provide it through the applicable government-facing mechanism.

A coordinated industry effort through existing multilateral governance bodies is therefore required to define:

- Standard mapping frameworks
- Common interpretation rules
- Validation mechanisms ensuring consistency across transformations

This will ensure that the transition preserves data integrity, auditability, and compliance.

3.3. Defining the Next Generation of Data Transmission Standards

Current passenger data transmission relies heavily on legacy message formats such as UN/EDIFACT and, increasingly, XML. These formats are robust and widely implemented, but they were not designed for modern interoperable, real-time, event-driven, system-to-system architectures. Future transmission standards should therefore preserve continuity where required while enabling more flexible, structured, and interoperable data exchange models.

The transition to Offer and Order-based environments necessitates the evolution toward modern, flexible, and interoperable data exchange models.

Key characteristics of future passenger data transmission should include:

- **Adoption of modern data formats** (e.g., JSON, a lightweight machine-readable format commonly used for system-to-system data exchange - example of JSON payload in Figure 5.2 in Annex 5) for improved compatibility with contemporary systems.
- **Support for modern and open passenger data transfer mechanisms**, using Application Programming Interfaces for real-time interactions (e.g., iAPI) and message-oriented protocols for secure, reliable, and auditable B2B data exchange where asynchronous communication is required (e.g., in pre-Order world: API and PNR). Which can help address the cost of passenger data transmission.
- **Enhanced data validation**, leveraging JSON Schema (see Figure 5.2 in Annex 5), improve traceability, and auditability.
- **Greater alignment between Advance Passenger Information, PNR, and future Order data transmission models**.

As noted in the current work of industry groups, including the development of JSON-based formats, these evolutions are already underway but require harmonized adoption and governance.

Without a clearly defined target architecture, there is a risk that modernization efforts will replicate existing fragmentation in new technical forms.

3.4. Leveraging Digital Identity and Data Quality at Source

Data quality remains one of the most persistent challenges impacting airlines and authorities. Errors introduced during booking, reliance on manual data entry, repeated data capture across multiple touchpoints, and inconsistent sources all contribute to degraded data quality, increased operational costs, and compliance risks.

Digital Identity represents a fundamental opportunity to address these challenges at their origin.

The true game changer is the ability for airlines to capture verified passenger identity data before the passenger journey progresses through downstream processes. Rather than relying on manual entry of passport and identity information, airlines can obtain passenger data directly from trusted and verifiable digital identity credentials, ensuring that accurate data enters the travel ecosystem from the outset.

In the future passenger data ecosystem:

- **Passenger identity attributes can be verified once and reused across the journey**.
- **Passenger data can be captured directly from trusted digital credentials**, reducing dependence on manual entry and subsequent corrections.
- **Airlines can establish a high-quality "single source of truth" for passenger identity data within the Order**, supporting downstream operational, facilitation, automation and regulatory processes.
- **Verified identity attributes can be reused** across airlines, airports, and authorities through interoperable digital identity frameworks, subject to applicable legal requirements and appropriate data protection safeguards.

This evolution brings significant benefits for all stakeholders:

- **Passengers** benefit from a simpler and more seamless experience by avoiding repeated submission of identity information and reducing the likelihood of delays caused by data discrepancies.
- **Airlines** benefit from improved data quality at source, reduced operational costs associated with document verification and data correction, fewer boarding and admissibility issues, and increased automation opportunities.
- **Authorities** receive more accurate and reliable passenger data, supporting more effective risk assessment, border management, and facilitation outcomes.

While Orders may contain richer commercial and operational data than today's PNRs, the availability of additional data does not imply broader transmission of information to governments. Rather, a high-quality Order creates opportunities to share only the specific data required for a given regulatory or facilitation purpose, supporting data minimization while providing authorities with more accurate, trusted, and contextually relevant information. This enables more effective risk assessment and decision-making based on better data rather than more data.

By shifting identity verification upstream to the point of Order Creation and leveraging trusted digital identity credentials, the industry can significantly improve data quality at source. This enables governments and airlines to move away from collecting and validating the same information repeatedly, towards the targeted sharing of trusted, purpose-specific data that supports facilitation, border security, and regulatory requirements.

This approach aligns particularly well with the Modern Airline Retailing vision of airlines being in control of their products, data, and customer relationships, while enabling the "capture once, use many times" principle that underpins both digital identity and future passenger data transformation initiatives.

3.5. Strengthening Governance and Implementation Oversight

While international standards for passenger data already exist, the primary challenge identified in this paper is inconsistent implementation and divergence from those standards.

Operationalizing the future of passenger data requires not only updated standards but also strengthened governance mechanisms to ensure their consistent application.

These governance enhancements directly address the challenges identified in Sections 2:

- **Improve oversight mechanisms for implementation of passenger data standards**.

- **Improve the change management processes**, known as the WCO Data Maintenance Request, to enable quicker turn-around, improve transparency so stakeholders have visibility on the items raised and predictability of updates.
- **Formalized issue resolution frameworks**, allowing discrepancies and conflicts to be addressed systematically and remediate.
- **Improved visibility of national deviations (non-standard requirements)**, reducing uncertainty and compliance risk.

A reinforced governance model will ensure that future standards do not replicate existing fragmentation and that all stakeholders operate within a predictable and coordinated framework.

3.6. Coordinated Transition Strategy

The transition to Order-based concepts for passenger facilitation will be gradual and prolonged, with coexistence of legacy and modern systems across airlines and authorities worldwide.

Operationalizing this transition requires a structured and coordinated approach.

Key transition mechanisms include:

- **Parallel support through the Passenger Data Single Window (PDSW)** during the coexistence phase.
- **Standardized translation solutions to ensure interoperability** between legacy and modern systems.
- **Phased roll-out to minimize operational disruption** and align with industry readiness.

The scenarios outlined in Section 3 demonstrate that multiple states of coexistence will exist simultaneously across stakeholders.

A coordinated transition framework will therefore be essential to:

- Ensure continuity of compliance
- Maintain operational resilience
- Avoid fragmentation during the transformation

3.7. Recommendations for Industry Action

Based on the findings of this white paper, the following recommendations are proposed to support IATA Travel Standards Board decisions on the operationalization of the Future of Passenger Data. These recommendations are intended to guide future industry work and stakeholder collaboration across standards development, governance, and implementation.

3.7.1 Data & Architecture

These actions focus on establishing a coherent, future-proof passenger data architecture that is record-agnostic, interoperable, and aligned with modern system design principles.

- Define standardized mapping between PNR and Order data structures, ensuring continuity of required passenger datasets across commercial models and regulatory requirements.
- Visual representations of current PAXLST and PNRGOV message structures and relevant future Order-related capabilities may be developed as supporting materials for the future work. These materials could support a common understanding of the existing government-facing standards, the evolving airline source environment, and the scope of the analysis required.

- Align relevant data definitions and transmission interfaces across API, PNR, and future Order-related passenger data models, while preserving the distinct purpose, legal basis, and operational role of each data set.
- Use harmonized passenger data transmission standards aligned with modern system architectures and reduce cost of transmission.
- Assess modern, open, and internationally governed data formats and interface patterns, including JSON, Application Programming Interface based interactions, and secure asynchronous messaging, where they demonstrably support the agreed business, security, operational, and regulatory requirements.
- Ensure that Offer and Order frameworks are aligned with future passenger data transmission standards, including JSON-based and Application Programming Interface-enabled models where appropriate, enabling consistent integration with future passenger data transmission standards.
- Improve implementation guides with Open Application Programming Interface (OpenAPI) Specification (see Figure 5.3 in Annex 5), a machine-readable framework used to document API structures, interfaces, validation rules, and security requirements, enabling clearer documentation, improved version control, and traceability of changes over time.

3.7.2 Governance & Oversight

These actions aim to strengthen institutional coordination, reduce fragmentation, and ensure consistent interpretation and implementation of passenger data standards.

- Request the WCO/IATA/ICAO Contact Committee to assess the impact of the Future of Passenger Data on its processes and oversight mechanisms, including implications for existing standards and governance arrangements.
- Ensure that relevant IATA Open Air initiatives are coordinated with the WCO/IATA/ICAO Contact Committee, supporting alignment and avoiding siloed or divergent design approaches.
- Evaluate, within the PAXLST and PNRGOV working groups, opportunities to improve coordination, semantic consistency, and change-management coherence between API and PNR governance structures.

3.7.3 Transition & Implementation

These actions address the practical realities of coexistence between legacy and modern systems and aim to ensure a coordinated, low-risk transition.

- Establish coordinated transition programs involving airlines, authorities, and technology providers, supporting parallel operation of legacy and modern passenger data systems.
- Integrate digital identity frameworks to improve data quality at source, reducing reliance on repeated manual data capture and enhancing trust in transmitted passenger data.

These actions are built directly on the principles and transition pathways outlined in this white paper and provide a structured roadmap toward practical implementation.

3.8. Expected Outcomes

The successful operationalization of the Future of Passenger Data will enable:

- Improved data quality and reliability, supporting more effective risk-based border management
- Reduced complexity and compliance burden for airlines through simplified and harmonized standards
- Enhanced interoperability across systems, stakeholders, and jurisdictions
- Stronger security outcomes for States through earlier and more accurate data availability
- A more seamless and predictable passenger experience, enabled by automation and digital processes

Ultimately, the future of passenger data represents a coordinated evolution of the global ecosystem; one that preserves the integrity of existing legal obligations while enabling industry to fully benefit from modern data architecture and digital transformation.

4. Conclusion

The transition to **Modern Airline Retailing** presents the passenger data community with a **significant strategic decision**. While the industry's policy objectives regarding border security, risk assessment, and facilitation remain unchanged, **the underlying data architecture that supports these objectives may evolve substantially**.

Three potential pathways can be envisaged:

- **Evolution of the existing PNR model**, whereby current passenger data frameworks are modernized through improved transmission standards, governance, and interoperability while retaining the PNR as the principal source record.
- **Transition from PNR to Order-based passenger data**, whereby the Order becomes the primary airline business record, from which regulatory passenger data is sourced and transmitted to border control authorities in replacement of PNRGOV.
- **Development of a new record-agnostic passenger data model**, independent of both PNR and Order constructs, where regulatory requirements are defined through standardized data elements, business semantics, and governance frameworks regardless of the underlying airline system architecture.

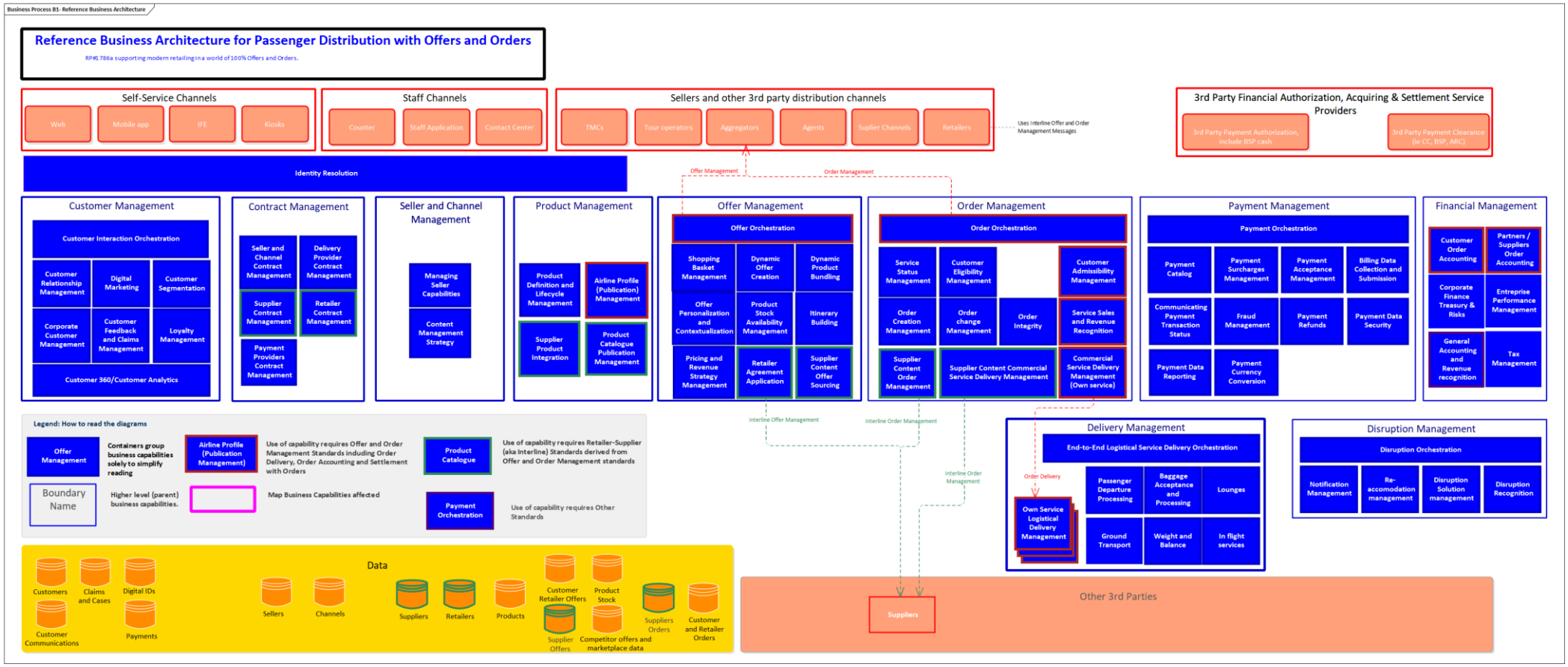
The purpose of the **Future of Passenger Data initiative is not to predetermine which of these pathways should ultimately prevail**. Rather, it is to establish the principles, governance structures, interoperability requirements, and collaboration necessary to support an informed and coordinated transition within the IATA Travel Standards Board and the established ICAO, WCO, and WCO/IATA/ICAO Contact Committee processes, with substantive participation by States and competent authorities.

What is clear, however, is that **future passenger data frameworks must remain technology-neutral, globally interoperable, secure, and capable of supporting both current and future airline operating models**. The industry's long-term success will depend not on the persistence of any specific record structure, but on its ability to ensure that **required passenger data can be shared consistently, reliably, and efficiently across a rapidly evolving travel ecosystem**.

A special thank you to the Future of Passenger Data Task Force contributors.

5. Annex

5.1. IATA Recommended Practice 1786a (Reference Business Architecture)



IATA Recommended Practice 1786a

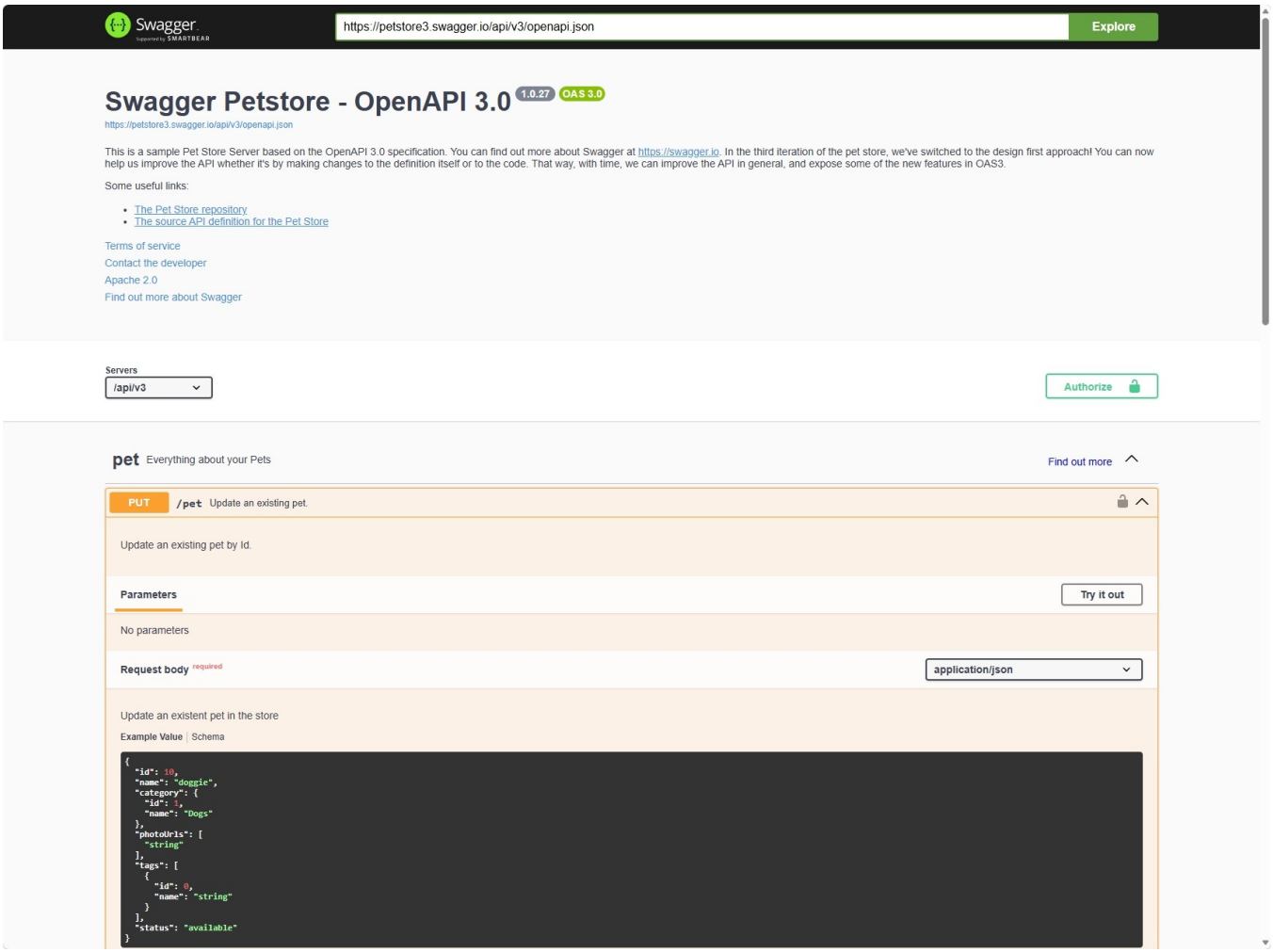
5.2. JSON Schema

```
{
 "type": "object",
 "properties": {
  "first_name": { "type": "string" },
  "last_name": { "type": "string" },
  "birthday": { "type": "string", "format": "date" },
  "address": {
    "type": "object",
    "properties": {
      "street_address": { "type": "string" },
      "city": { "type": "string" },
      "state": { "type": "string" },
      "country": { "type" : "string" }
    }
  }
 }
}
```

Description: The JSON schema represents an individual person. It allows storage of the person's first name, last name, date of birth, and a structured address containing street address, city, state/province, and country. All fields are optional, and any provided values must be strings, except that the birthday string must follow a date format.

5.3. Open Application Programming Interface (OpenAPI)

5.3.1 OpenAPI generated documentation and live demo



Source OpenAPI - OpenAPI Example

5.3.2 OpenAPI endpoints definition


```
{
 "openapi": "3.0.4",
 "info": {
  "title": "Swagger Petstore - OpenAPI 3.0",
  "description": "This is a sample Pet Store Server based on the OpenAPI 3.0 specification",
  "termsOfService": "https://swagger.io/terms/",
  "contact": {
   "email": "apiteam@swagger.io"
  },
  "license": {
   "name": "Apache 2.0",
   "url": "https://www.apache.org/licenses/LICENSE-2.0.html"
  },
  "version": "1.0.27"
 },
 "externalDocs": {
  "description": "Find out more about Swagger",
  "url": "https://swagger.io"
 },
 "servers": [
  {
   "url": "/api/v3"
  }
 ],
 "tags": [
  {
   "name": "pet",
   "description": "Everything about your Pets",
   "externalDocs": {
    "description": "Find out more",
    "url": "https://swagger.io"
   }
  },
  {
   "name": "store",
   "description": "Access to Petstore orders",
   "externalDocs": {
    "description": "Find out more about our store",
    "url": "https://swagger.io"
   }
  },
  {
   "name": "user",
   "description": "Operations about user"
  }
 ],
 "paths": {
  "/pet": {
   "put": {
    "tags": [
     "pet"
    ],
    "summary": "Update an existing pet.",
    "description": "Update an existing pet by Id.",
    "operationId": "updatePet",
    "requestBody": {
```


Source OpenAPI - OpenAPI Specification example