Baggage Tracking

IATA Resolution 753

Implementation Guide

Issue 4.0 November 2023

Contents

PROJECT TITLE:	**Baggage Tracking, IATA Resolution 753 Implementation Guide**
Issue	Issue 4.0
Last Amendment Date:	30 November 2023
Prepared by	Baggage Working Group (BWG) representatives in collaboration with IATA
Reviewed and recommended by	Baggage Working Group (BWG)
Endorsed by	Travel Standards Board (TSB)

1. Introduction

Baggage is one of the key customer satisfaction elements for airlines. A failure to deliver the passengers' baggage will quickly cancel out any other positive experiences of the flight. The costs associated with reuniting baggage and passenger, estimated by IATA at $100 per bag, will also quickly eat into the margins for the journey. At the same time the additional workload to deal with the customer, the baggage and the other airlines / airports involved will waste valuable resources. Even though mishandling has more than halved since the 2007 peak, more than $2 billion was still spent in a recent year just settling claims and repatriating baggage – that is $0.65 for every passenger that flew; and even though the rate of mishandling is decreasing, the overall cost to the industry is still increasing in many cases, due to the growth in the number of passengers and baggage.

It is clear that the industry must continue to strive towards lower mishandling and better service. One of the key elements, is the capability to track a bag throughout its journey. If baggage processing really was a factory, then we currently live in a world where the factory has no information on the input of components, the processes to be applied and no idea when the finished product is delivered to the customer. No real-world factory could operate on such scarce information, yet this is exactly the situation for baggage in the aviation industry. It is a credit to all the people working in baggage that the mishandling rates are as low as they are, and that they continue to drop.

Baggage tracking is key for our industry to continue to drive costs down and improve service at a fundamental level. It is also central for airlines to have the capability to obtain the information needed for passengers when their baggage is mishandled, regardless of which carriers were involved. Resolution 753 is mandatory for all IATA members and demands tracking in key locations. The aim of the resolution is to reduce mishandling and increase passenger satisfaction by first recording and subsequently exchanging baggage tracking information.

This guide aims to support the implementation of baggage tracking according to Resolution 753. Whilst the principle of 753 is very simple – track bags through the baggage facilities, onto aircraft and back to passengers - the implementation can be daunting. Inside this guide you will find all the information needed to assist you in implementing tracking across the airline route network and within individual airports, including best practices for operations of all sizes. It includes a description of each of the key recording technologies available to the industry today, how data can be shared between the parties involved in carrying the baggage, and what the responsibilities of each party are. The guide has been produced by the IATA Baggage Working Group (BWG), representing airlines, airports, Ground Handling Service Providers (GHSPs), and IATA Strategic Partners, bringing a wealth of practical information on successful baggage tracking.

All questions related to this implementation guide may be directed to baggageservices@iata.org. A better alternative, though, would be to play an active role in the IATA Baggage Working Group. This is where the initial resolution for baggage tracking originated and where critical future developments for our industry are first discussed.

2. Executive summary

IATA Resolution 753, active from June 2018, is intended to encourage airlines to further reduce mishandling by implementing cross-industry tracking for every baggage journey.

The resolution itself is simple, but IATA and its members understand that the implementation of baggage tracking can be a complex process. Reducing the number of mishandled bags is a common goal for everyone in the aviation industry, however in today's world, airlines cannot be expected to blindly implement new processes without understanding the benefits of implementing these. A further complication is the role of airports and GHSPs – the resolution places an obligation on IATA member airlines: nevertheless, in many cases, the airlines will be looking to the airports from which they operate, and the GHSPs who load the baggage, to provide the data that they need.

This document is therefore aimed at airlines, GHSPs and airports, or any other party with an interest in helping airlines to meet their obligations under Resolution 753. It attempts to help the reader break down the overall topic of 'network wide baggage tracking' into a set of manageable topics, and to address each of them in turn:

1. What is meant by 'baggage tracking'; what data needs to be recorded, the timeliness of that recording and the potential methods to be used.

2. What is meant by 'exchange of information' as well a discussion around timeliness of exchange and the mechanisms that can be used.

3. A discussion of how tracking and data exchange can be used to achieve the benefits outlined in the resolution.

4. A look at how baggage tracking partners can work together to implement a cost-effective compliance to the resolution.

5. A discussion on best practice, and how tracking strategies could be evaluated.

The document also includes a data charter, which outlines the conditions that should be met when airlines are sharing data with each other; a number of appendices outline some frequently asked questions covering topics such as communication, collaboration and implementation; some case studies which outline real-world examples relevant to Resolution 753; and some additional information such as standard process views and how irregular operations might affect tracking.

3. Resolution 753

3.1. Current resolution

IATA Resolution 753 became effective on 1 June 2018

3.2. Compliance with Resolution 753

Compliance is a loose term, as different carriers and providers of services have different versions of what they consider compliance to be. Compliance with the resolution can be demonstrated only by an airline and only to IATA. In general, IATA will not provide a statement of compliance for airlines; however, airlines wishing to demonstrate excellent tracking capability may request that IATA issue a compliance certificate for their operations, which will be valid for 3 years for HUB certification and 5 years for network certification. This certificate does not exempt the airline from any obligations under Resolution 753.

4. Disclaimer

The baggage journey is a complex process subject to external influences. Airports are complex environments potentially affected by many issues, from exceptional weather and industrial action to failure of essential IT systems. Any of these issues can lead to disruptions, including the process of baggage tracking. In such cases, the

Airport operators, airlines, and GHSPs should:

- Assess the severity of a disruption event and decide how to deal with it.
- Put an action plan in place to deal with unavoidable disruptions such as weather delays.
- Put procedures in place to minimize the impact of avoidable disruptions such as IT failures.

This implementation guide for Resolution 753 is not intended to be a set of instructions; it has been created to provide examples of best practice in the aviation industry in relation to Baggage Tracking Resolution 753. Some of the recommendations in this document may not be appropriate for some airlines, airports or operations; some will need to be adapted in order to be applicable.

The document was created by the Baggage Working Group (BWG) representatives. The BWG comprises experts from airlines, GHSPs, airports and airport suppliers who have combined their knowledge and expertise in order to create a set of baggage tracking recommendations.

This document is intended to be a living document subject to periodic review. The BWG welcomes feedback on the document; either on ways in which it can be improved, or, more importantly, on how any entity has used the information contained within to implement baggage tracking. Please provide your feedback at baggageservices@iata.org

5. Glossary of terms and acronyms

Terms

ACCEPTANCE	The initial transference of possession, control and/or security of checked baggage from a passenger to a member or its agent for carriage.
ACQUISITION	The acceptance of baggage by a member or its agent.
ARRIVAL FACILITY	The final delivery point at which time the transference of possession, control, and/or security of checked baggage is returned to the passenger.
AS NEEDED	The exchange of data between airlines involved in a bag's journey should be defined between those airlines involved in that journey.
BAGGAGE CART or TROLLEY	Temporary load device used to transport baggage from the baggage area to the ramp (or vice versa) for loose load aircraft or holds.
BAGGAGE, CHECKED (equivalent to "registered luggage")	Baggage placed in the care and custody of an airline by a passenger, for which the passenger has purchased a ticket and been checked in, and for which the airline has issued a baggage tag; this extends to include baggage accepted as checked at a departure gate if said baggage will only be returned to the passenger at an arrival's facility.
BAGGAGE MESSAGES	Baggage information messages transmitted by members, which may include the Baggage Transfer Message (BTM), Baggage Source Message (BSM), Baggage Processed Message (BPM), Baggage Unload Message (BUM), Baggage Not Seen Message (BNS), Baggage Control Message (BCM)? and Baggage Manifest Message (BMM), and Baggage Request (BRQ) as described in PSC RM RP1745.
BAGGAGE TRANSFER	Baggage arriving at a point on one flight and continuing its journey on another flight within a defined time limit.
BULK HOLD	The aircraft hold in which baggage is loose loaded (loaded individually), rather than in a Unit Load Device (ULD).
CHANGE IN CUSTODY	The transfer of possession, control and/or security of checked baggage from a member or its agent to another member or its agent.
CUSTODY	The assumption of possession, control and/or security of checked baggage by a member airline or its agent.
DATA EXCHANGE	The exchange of data between a user and a system; two users; two systems; or several systems.
DELIVERY	The carriage of checked baggage from the airport of origin to either the airport of destination or the local address as provided by the passenger.

DEMONSTRATE	The capability to produce a record as needed.
EVENTS	Demonstration of delivery and/or acquisition of checked baggage when custody changes, and/or the provision of an inventory of checked baggage upon departure of a flight.
EXCEPTION PROCESSING	Identification of baggage that has had a change in custody but did not progress further due to the separation of the baggage from the passenger's ticketed itinerary and requires Expedition/RUSH to the passenger's final destination.
EXPEDITE BAGGAGE or RUSH BAGGAGE	Baggage that has become separated from its passenger and requires manual expedition via re-flighting to the passenger's final destination.
INJECT	The introduction point of checked baggage into any applicable baggage system.
INVENTORY	An accurate count of all checked baggage which is either accepted or acquired by a member or its agent for carriage in connection with the trip for which a passenger has purchased a ticket and which has been checked in.
MISHANDLED BAGGAGE	Baggage that is damaged, delayed, lost or pilfered.
PRORATION	Division of a joint fare, rate or charge between the carriers concerned on an agreed basis.
RECONCILIATION	The verification of baggage belonging to passengers who are travelling on that specific flight or baggage that has been subjected to other security control measures in compliance with regulatory requirements (e.g. ICAO Annex 17).
RECORD	To set down in writing or some other permanent form, the acceptance, acquisition, or change in custody of checked baggage for later reference.
RECORDING	The action of taking a record.
SCAN	The traversing by a detector or an electromagnetic beam of a barcode or other machine-readable identifier for the purpose of identification.
TAIL-TO-TAIL or FIN-TO-FIN	The transfer of baggage, freight, and mail from aircraft to aircraft without an intermediate point.
TEN DIGIT BAR CODE / TEN DIGIT BAG TAG	See License Plate Number (LPN)
TRACKING POINT	Any place or position in which a baggage record is created to identify time and location.

Acronyms

ACI	Airport Council International
ACI – NA	Airport Council International – North America
AOC	Airline Operator Committee
API	Application Programming Interface
BCM	Baggage Control Message
BHS	Baggage Handling System
BIM	Baggage Information Message
BLE	Bluetooth
BMM	Baggage Manifest Message
BNS	Baggage Not Seen message
BPM	Baggage Processed Message
BRQ	Baggage Request
BRS	Baggage Reconciliation System
BSM	Baggage Source Message
BSP	Baggage Service Provider
BTM	Baggage Transfer Message
BUM	Baggage Unload Message
BWG	Baggage Working Group
CCTV	Closed Circuit Television
CDS	Container Delivery System?
CSV	Comma Separated Values
FAA	Federal Aviation Authority (USA)
GHPS	Ground Handling Service Provider
GPS	Global Positioning System

ICAO	International Civil Aviation Organization
JSON	Java Script Object Notation
KPI	Key Performance Indicator
LBC	Local Baggage Committee
LPN	License Plate Number: The LPN serves to identify the respective piece of baggage in Automated Baggage System (ABS) and Departure Control Systems (DCS) and acts as a key to access the data exchanged in BIMs as defined in RP1745/RP1755. Also referred to as a 10-digit bar code or 10-digit bag tag.
NFC	Near Field Communication
OCR	Optical Character Recognition
PNR	Passenger Name Record
RFID	Radio Frequency Identification
RP	Recommended Practice
SLA	Service Level Agreement
SP	Strategic Partner (full name IATA Strategic Partnership program)
TRB	Transportation Review Board
ULD	Unit Load Device: An aircraft pallet or container used to load and restrain baggage, freight and mail in aircraft designed and certified for the use of ULDs.
XML	Extensible Markup Language (XML): A markup language that defines a set of rules for encoding documents in a format that is both human readable and machine readable, as defined by the /W3C's XML specification and other related specifications, all of which are free open standards.

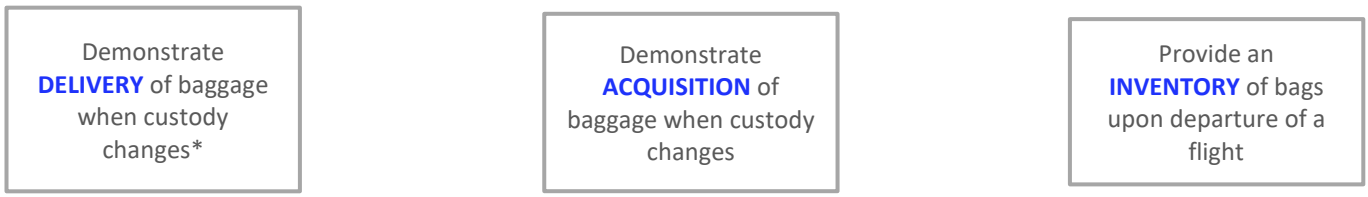
6. Bag tracking points

This section describes what the core tracking points are, the definition of a tracking point, what is recorded and at which locations these tracking data can be recorded.

6.1. Core tracking points

Airline obligations under Resolution 753 are:

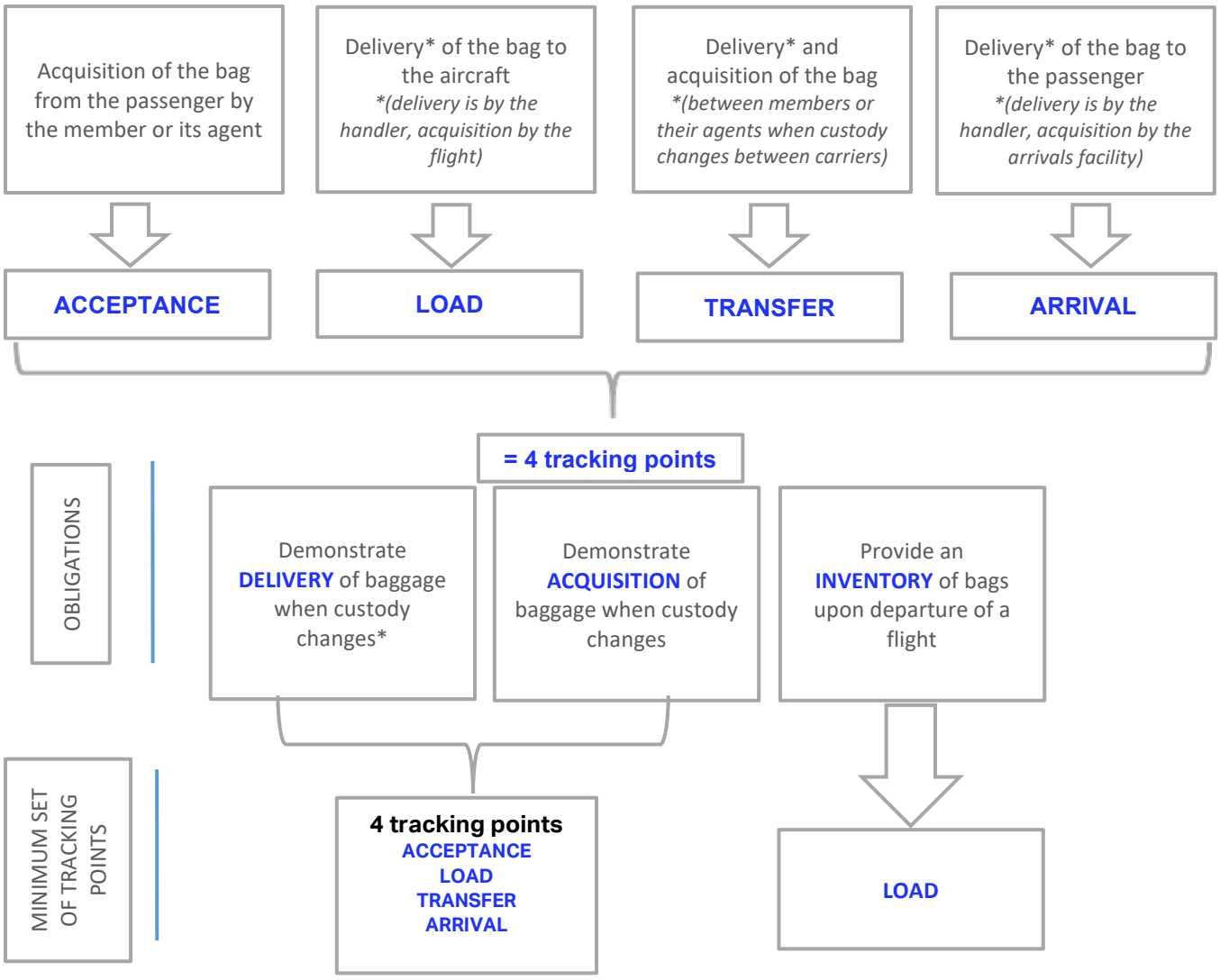
- Demonstrate delivery of baggage when custody changes*;
- Demonstrate acquisition of baggage when custody changes*;
- Provide an inventory of bags upon departure of a flight.



** Change in custody: the transfer of possession, control and/or security of checked baggage from a member or its agent to another member or its agent.*

These obligations translate to the minimum set of recorded tracking points as referenced in Section 3 – Tracking Requirements of Resolution 753 as follows:

- Acquisition of the baggage from the passenger by the member or its agent at the airport or off airport locations → Acceptance
- Delivery of the baggage onto the aircraft →Load
- Delivery and acquisition of the baggage between members and their agents when custody changes between carriers →Transfer
- Delivery of the baggage to the arrival facility →Arrival



** Change in custody: the transference of possession, control and/or security if checked baggage from a member or its agent to another member or its agent.*

The 4 mandatory tracking points are reflected in the baggage journey as showed below.

Please note that acceptance will occur when the baggage is placed in the care and custody of an airline by a passenger as defined under Section 5 – Glossary of Terms for "baggage, checked". An acceptance process is outlined in Sub-section 13.1 - Appendix B – Sample Process Views. Additionally, acceptance covers all baggage including oversized baggage.

The four tracking points have been chosen because they form the minimum set of points that can record every bag as it enters and leaves the airport.

A tracking point for the check-in (e.g. at baggage drop)[1] will tell the airline how many pieces of baggage have been accepted. A tracking point at aircraft loading[2] will tell the airline that the baggage has departed the originating airport on a particular flight. This is not the same as reconciliation, which confirms that the baggage and the passenger are on the same flight.

When a bag is transferred[3] through a subsequent station then there should be a further event indicating that the bag has been seen at the transfer process of the airport. This event tells the airline that the bag is at the transfer station and is important as it confirms the bag is one that should be available for the next flight. A baggage loader often has a list of expected baggage for a flight, and if a bag is missing, he is unable to determine if the bag is available at the airport or missed its inbound flight.

The last point of tracking is at the arrival carousel at the final destination[4]. This tracking event tells the airline that the baggage journey is over and that the bag has been delivered. It is the only way that the airline can prove to passengers making a claim that the bag was really delivered to the reclaim carousel.

A tracking event for loading the bag onto the inbound flight is not sufficient as this does not account for bags that are accidently delivered to the transfer area, cargo area or offloaded.

With a tracking point at arrivals, it is also possible to capture baggage sent to arrivals by error, and of course the transfer tracking point can perform the same function for baggage sent to transfer by error. Baggage runners may then be sent to collect these bags and ensure they are sent through the correct processes.

6.2. Definition of a tracking point

In baggage tracking terms, a tracking point is when data is recorded about a bag. This is often tied to a physical location (e.g. a scan at an ATR on a claim line), but it may also be a record of an action in a system (e.g. a record that the passenger dropped off their bag). Resolution 753 specifies the four core tracking points that must be recorded for compliance with the Resolution. Recording a tracking point refers to the action of setting down in writing, or other permanent form, the acceptance, acquisition or change in custody of a bag for later reference.

[1] Please note that when a physical scan is not feasible an electronic baggage information message that represents a physical acceptance is acceptable (e.g. active BSM, BPM).
[2] A load process is outlined in Sub section 13.2 Appendix B – Sample Process Views.
[3] A transfer process is outlined in Sub section 13.3 Appendix B – Sample Process Views.
[4] An arrival process is outlined in Sub section 13.4 Appendix B – Sample Process Views.

6.3. What is recorded at a tracking point

6.3.1 Primary data element

The ten-digit bag tag number is mandatory in all cases when recording tracking points. Date and time would also be recommended especially in case of offline scanning.

6.3.2 Secondary data elements

The following items should also be recorded where available.

- Passenger Name
- Passenger Name Record (PNR)
- Outbound flight number and date
- Inbound flight number and date
- Onward flight number and date
- Security/Sequence Number
- Tracking action/event
- Time and date of recording
- Station of recording
- Recording Location/device (physical location)
- Container ID (Unit Load Device (ULD), Trolley or Cart)

If the recommended data elements are available by association, it does not need to be repeated; for example, recording the ten-digit bag tag and the flight number/date would enable the passenger name and PNR to be obtained from a reservations system.

6.4. Where and how can a tracking point be recorded

The following tables describe the possible tracking points where custody change can be recorded, the recommended data element for the tracking points and examples of recording methods.

The tracking point can only be used as change of custody if all the recommended elements are available. Airlines should aim to record as many tracking points as are available.

6.4.1 Recording ACCEPTANCE

Possible tracking point locations	Recommended data elements to record	Example of how to record the tracking point
Check-in Counter (airport / off airport)	Licence Plate Number (LPN), Outbound Flight, Station, Time	Manual or handheld scanner (barcode, Optical character Recognition (OCR), Radio Frequency Identification (RFID)
Bag Drop	LPN, Outbound Flight, Station, Time	Self-service bag drop reader (barcode, OCR, RFID)
Security Screening	LPN, Outbound Flight, Station, Time	Fixed inline scanner (barcode, OCR, RFID) Handheld scanner (barcode, OCR, RFID) Manual entry (e.g., on a fixed or mobile workstation associated with the screening system)
Baggage Handling System (BHS)	LPN, Outbound Flight, Station, Time	Fixed inline scanner (barcode, OCR, RFID) Handheld scanner (barcode, OCR, RFID) Manual entry (e.g., on a fixed or mobile workstation associated with the screening system)
Gate	LPN, Outbound Flight, Station, Time	Manual or handheld scanner (barcode, OCR, RFID)
Baggage Reconciliation System (BRS)	LPN, Outbound Flight, Station, Time	Manual or handheld scanner (barcode, OCR, RFID)

Notes:

- In general, the tracking point should be recorded as early as possible after the physical handover from the passenger; this applies especially to cases where downstream systems (e.g., BHS, Security Screening, BRS, etc.) are being used to indicate acquisition.
- For gate tracking points, this would be for baggage accepted by the airline at the gate, such as mobility aids or carry-on baggage that cannot remain in the cabin (e.g., due to space or item size limitations).

6.4.2 Recording LOAD

Possible tracking point locations	Recommended data elements to record	Example of how to record the tracking point
Bag bulk loaded into hold	LPN, Outbound Flight, Station, Tracking Action	Handheld scanner or fixed belt loader reader (Barcode, RFID)
Bag loaded into ULD (See note)	LPN, Outbound Flight, Station, Tracking Action, Container ID	Manual or handheld scanner (barcode, OCR, RFID)
ULD position in hold (See note)	Outbound Flight, Station, Tracking Action, Container ID (plus all associated LPNs)	Data entry into a BRS (manual, barcode, RFID)
Bag loaded into trolley/cart (See note)	LPN, Outbound Flight, Station, Tracking Action, Container ID	Manual or handheld scanner (barcode, OCR, RFID)
Trolley/cart load into hold (See note)	**Either**: Outbound Flight, Station, Tracking Action, Container ID (plus all associated LPNs);	Data entry into a BRS (manual, barcode or RFID)
	Or: LPN, Outbound Flight, Station, Tracking Action (2 step process)	Handheld scanner or fixed belt loader reader (Barcode, RFID)

Notes:

- If an airline records the "Delivery of Bag onto the Aircraft" tracking point by recording the loading the bag into a loading device (ULD, Baggage Trolley or Cart), there is a risk that the bag may not actually be loaded onto the aircraft; for example, the bag may fall out of the ULD / trolley / cart during transport, or the ULD may not be actually loaded/transferred onto the aircraft. The airline should therefore mitigate this risk by defining suitable operational processes. This could range from training to ensure loaders close curtains or other physical restraints to prevent bags from falling off, to implementing a two-step process for baggage trolleys or carts to scanning bags onto the load device and then repeating the scan as the bags are transferred into the hold.

- The airline should ensure, that any baggage which has not been loaded on an aircraft, either in Bulk or in ULDs are recorded as "NOT LOADED" accordingly.

- Tail-to-tail containers fall into the "ULD Position in Hold" tracking point, but tracking is performed by recording the ULD or container ID, and the inventory of baggage in the container will need to be obtained from the originating carrier.

6.4.3 Recording TRANSFER

Change of custody from the delivering carrier to the receiving carrier must be agreed between the relevant parties. Ideally, recording the presence of the bag at a single agreed tracking point should act as both the demonstration of delivery and demonstration of acquisition. There may be one or more agreed tracking points, and they may vary depending on time or other operational factors (e.g., regular vs oversize baggage).

When third parties are involved (e.g., interline GHSPs), recording of additional custody changes between agents acting on behalf of the same carrier is also recommended. See the case studies in appendix C for more details.

Possible tracking point locations	Recommended data elements to record	Example of how to record the tracking point
Bag custody change (carrier to carrier)	LPN, Inbound Flight, Outbound Flight, Station, Time, Recording Location	Depended on the chosen bag exchange tracking point
Bag custody change (carrier to/from third party)	LPN, Inbound Flight, Outbound Flight, Station, Time, Recording Location	Depended on the chosen bag exchange tracking point
Tail to tail transfer container	LPN, Inbound Flight, Outbound Flight, Station, Time, Recording Location, Container ID	Handheld scanner or fixed belt loader reader (barcode, RFID)
Aircraft Unload	Bag tag number and location loaded (ULD or Bulk)	Handheld scanner or fixed belt loader reader (barcode, RFID)
Transfer Point	Bag tag number and location transferred	Handheld scanner or fixed pier and claim reader (Barcode, RFID, OCR)
BHS	Bag tag number and location transferred	Fixed sortation scanner (Barcode, OCR, RFID)

6.4.4 Recording ARRIVALS

Possible tracking point locations	Recommended data elements to record	Example of how to record the tracking point
Carousel Delivery	LPN, Inbound Flight, Station, Time	Fixed inline scanner (barcode, OCR, RFID) Handheld scanner (barcode, OCR, RFID)
Special Bag Claim Delivery (e.g. oversize)	LPN, Inbound Flight, Station, Time	Handheld scanner (barcode, OCR, RFID)

Direct delivery service to passenger	LPN, Inbound Flight, Station, Time, Recording Location, Tracking Action	Manual or handheld scanner (barcode, OCR, RFID)

Notes:

- For direct delivery to passenger, this may be airside, on the passenger boarding bridge (PBB), elsewhere at the airport, or off-site (e.g., direct delivery to hotel/cruise ship, delayed bags, etc.)

6.5. Potential recording methods

Recording of tracking points can be achieved in a variety of ways. The section below covers the predominant methods used in both the aviation industry and elsewhere. Other considerations, such as the cost of manual labour, are also discussed.

6.5.1 Laser or imager – optical scanning

Laser or imager scanning (Optical Scanning) is the most common recording method in the industry. Optical scanning requires barcode on the baggage tag and laser scanners or imagers to scan the baggage. It can be either fixed or handheld laser/Imager scanners. Optical scanners typically enable the transmission of data in real-time. IATA Resolution 740 defines the requirement for interline baggage tags supporting optical scanning.

- **Considerations:** Currently all baggage is identified with a barcode, which makes optical scanning the most common way of identifying baggage. Laser scanners or imagers are widely implemented through the aviation industry. A disadvantage of optical scanning is that it requires line-of-sight to scan the baggage tag. Baggage tags can also be damaged through handling, affecting the readability of the tag during the baggage journey. The cost of fixed scanners is relatively high, and labour costs should also be considered.

6.5.2 Manual recording

Manual recording is a valid method for collection of tracking point data. Manual recording is typically done, when there is an IT failure or the readability of the baggage tag has degenerated to a degree, where it cannot be read automatically. As the tracking information is printed on the tag, it does not require information from external systems to obtain a manual reading / recording. Data is typically not shared in real-time when using manual recording. IATA Resolution 740 defines the requirement for interline baggage tags supporting manual recording.

- **Considerations:** Manual recording can be done without any investment in scanner equipment or automated baggage handling systems. Manual recording is labour and time-intensive and has a higher risk of mis-recording than automated technologies. If the baggage journey is changed, it is likely not captured using manual recording of the bags. In addition, use of bingo stickers and sheets may not be an option for airlines who use Electronic Bag Tags and/or Home Printed Bag Tags, so an alternative mechanism must be identified.

6.5.3 RFID scanning

Application of RFID for baggage identification is becoming more and more common in the aviation industry. RFID uses a small chip in the baggage tag to identify and track the baggage; this can either be a disposable paper tag or permanent bag tag. Information is captured using either fixed or handheld RFID readers, and data is typically sent in real-time. IATA Resolution 740 defines the requirement for interline baggage tags supporting RFID scanning and IATA RP 1740c defines the requirement for using RFID for baggage identification.

- **Considerations:** RFID can be an effective way to track baggage; however, the cost of both infrastructure and tags should be considered in the overall cost calculation - all baggage needs to be identified with an RFID tag, which increases the cost of the label. RFID does not require line-of-sight to scan the tag, so the read rates are typically higher compared to laser and OCR scanning. RFID can beneficially be offered as complementary to barcode and OCR, if all bags are not identified with an RFID tag.

For more information, please refer to the various resources related to RFID standards, fact sheets, implementation guides and business cases from the IATA baggage website.

6.5.4 Optical Character Recognition (OCR)

OCR utilizes image-based technology to identify baggage. It takes an image of a complete tag and, using the right algorithms, translates the picture into a LPN. OCR requires barcodes on baggage tags and an OCR scanner to scan the baggage tag. OCR scanners are typically fixed and send data in real-time. IATA Resolution 740 defines the requirement for interline baggage tags supporting OCR scanning.

- **Considerations:** OCR has the advantage that, should a barcode not be legible, the OCR reader can decipher the numeric tag which could prevent the bag being sent for manual inspection. Additional information such as flight number and passenger name can also help identifying and processing duplicate bag tags.

6.5.5 Other technologies: Bluetooth (BLE), Near field Communication (NFC), Wi-Fi, GPS or other

More and more prevalent in the industry are tracking technologies based on Bluetooth, NFC, Wi-Fi, GPS or other. These technologies offer many of the same advantages as the more commonly used technologies, when applied to tracking. No IATA resolutions or RP defines the requirements for using these technologies for baggage identification.

- **Consideration:** While these technologies may be suitable for in-house tracking, the lack of standardization across baggage systems for these technologies may limit their usefulness. Usage of any active transmission technologies must demonstrate compliance to FAA Advisory Circular 91-21-C.

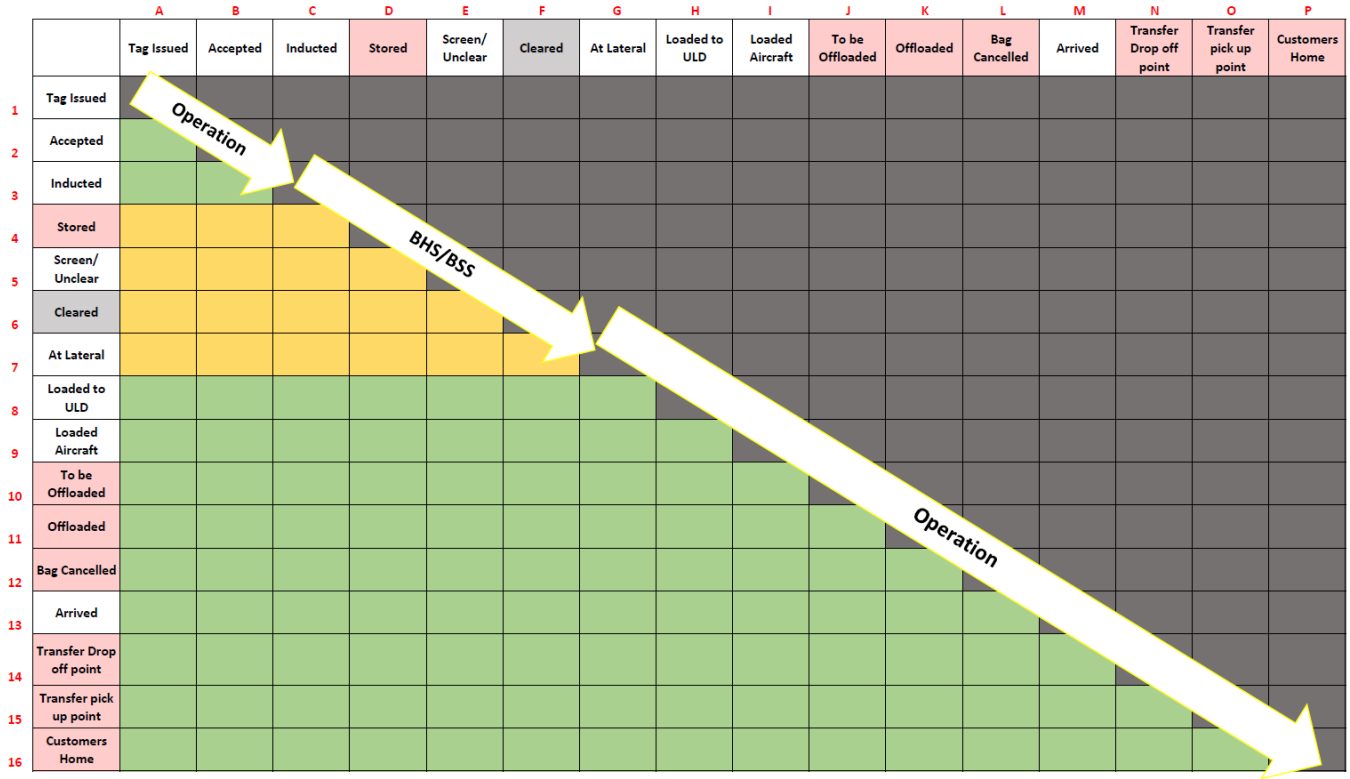
6.6. End to End baggage tracking

The below table illustrates a complete end to end baggage tracking for background information. Please note that several tracking points shown below go beyond the Resolution753 requirements.

As well as recording the exact position of a bag at each stage in its journey, baggage tracking data can be used to measure overall performance from the start of the baggage journey to the final stage, when the bag is returned to the passenger.

Stages 1 - 15 (A-O) are stages within the baggage journey which will provide the customer/airline a full account of all stages the bag will travel through until it arrives at the point of destination.

Stage 16 (P) may occur if the bag is mishandled; in that case, it will be tracked to the customer's home/delivery address (13)



		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
		Tag Issued	Accepted	Inducted	Stored	Screen/ Unclear	Cleared	At Lateral	Loaded to ULD	Loaded Aircraft	To be Offloaded	Offloaded	Bag Cancelled	Arrived	Transfer Drop off point	Transfer pick up point	Customers Home
1	Tag Issued																
2	Accepted																
3	Inducted																
4	Stored																
5	Screen/ Unclear																
6	Cleared																
7	At Lateral																
8	Loaded to ULD																
9	Loaded Aircraft																
10	To be Offloaded																
11	Offloaded																
12	Bag Cancelled																
13	Arrived																
14	Transfer Drop off point																
15	Transfer pick up point																
16	Customers Home																

Legend:

- *Cells in pink are sub states within the BHS/Loading and delivery process and reflect "status changes".*
- *Cells in yellow would be information hub airports would source from Airport systems BHS/BSS.*
- *Cells in green would be information from operational tools (e.g., CDS, BRS) and tracking tools.*

6.7. Tracking irregularities in operations

There are many irregular scenarios that airlines, airports and GHSPs face during day-to-day operations when handling baggage, including mishandled baggage, tagless baggage, gate baggage, crew baggage, out-of-gauge baggage, firearms, weapons, and more.

It needs to be stressed that Resolution 753 is not intended to cover all baggage and operational tracking processes of the IATA member carriers, but rather is intended to encourage the member carriers to ensure a minimum set of baggage handling actions are tracked (specifically, bag acceptance from passengers; custody exchange between carriers; bags loaded on departed aircraft; bag delivery to passenger).

Many types of irregular operations and baggage exceptions will be encountered at some point, but the requirements of the resolution do not distinguish between normally handled baggage and those bags handled under exceptional circumstances or irregular operations. Each airline can address their more irregular baggage scenarios in their own manner, but when irregular baggage is encountered at the core touch points described in this document, their handling should be recorded in the same manner as regular baggage.

Additional guidance and clarification for the treatment of some baggage irregularities can be found in Section 15.

7. Baggage data exchange

Resolution 753 has a distinct statement on the exchange of data among member airlines:

"Be capable of exchanging the above information (1.3) *with other members or their agents as needed."*

The purpose of this statement is to require IATA Member Carriers, when sharing the responsibility of handling interline baggage, to exchange the tracking events defined in Resolution 753.

Generic information related to baggage data exchange can be found under Section 12 - Appendix A – Frequently Asked Questions on baggage data exchange.

7.1. When to exchange baggage tracking data

Airlines may elect to exchange data with other parties at different times relative to the data being captured. This can be broken into two segments where data is used for on-demand activities or simply shared with another party where information security and commercial agreements are made.

The retention period of baggage tracking data should be long enough as per what is warranted under Resolution 753. The length of time could vary depending on the usage of data. When the data usage is for proration purposes, it is recommended airlines retain the data for 3 years - leaving enough time to close the cases.

7.1.1 On-demand / Operational:

- **As each bag is processed:** this is where a means of data exchange is used that allows the recording party to deliver or make available the data to the other suitable stakeholders, in near real-time, as each bag is processed.

- **On completion of flight:** the necessary data being exchanged could be accumulated and only exchanged on-block when the entire flight's baggage has been fully processed (for example on flight departure, on last arrival bag track)

7.1.2 Reported Information

- **Scheduled batch data delivery**: This might involve a data delivery between two parties at distinct times in the day, week or month. The data of interest would be accumulated and delivered in batch during agreed time periods/frequencies.

- **On request**: it may be appropriate for some members to be capable to exchanging data with other stakeholders; but only on request with specific justification (for instance, a pro-rate claim).

For the receiver of the data, each approach regarding the timeliness of data exchange results in different degrees of opportunity to benefit from the data exchange and subsequent overview of the baggage's journey.

Benefits in Resolution 753	Benefits to data exchange recipient			
	As each bag is processed	On completion of f	Batch data delivery	On request
Prevent and reduce mishandling by determining custody of every bag during different phases of baggage chain	Yes	Yes, via retrospective analysis	Yes, via retrospective analysis	Yes, via retrospective analysis
Increase passenger satisfaction, as mishandling is reduced	Yes	Yes, via retrospective analysis	Yes, via retrospective analysis	Yes, via retrospective analysis
Reduce the possibility of baggage fraud by closing the baggage journey	Yes	Yes	Yes	Yes, via retrospective analysis
Enable exceptions to be detected where baggage is delivered to a party, but not processed further	Yes	Yes, retrospectively	Yes, retrospectively	Yes, via retrospective analysis
Speed up reconciliation and flight readiness for departing flights	Yes	Yes, where information for inbound flights is available at time of departure	No	No
Help measuring compliance to Key Performance Indicators (KPIs)	Yes	Yes	Yes	Yes, via retrospective analysis
Provide evidence to an automatic interline proration process	Yes	Yes	Yes	Yes

While any exchange of data can lead to the benefits stated in the resolution, each member must evaluate, including considerations for the cost of implementation, which timing of data exchange will benefit them the most.

7.2. How to exchange baggage tracking data

Once agreement is reached on both the willingness to exchange baggage tracking data and the timeliness of that exchange, the final question in relating to data exchange is how it can be enacted. This generally falls into two additional questions:

- What technology is used to do the exchange
- The format the data should take

Note that to effectively manage the data exchange of the acquisition and delivery events, digital storage of this information is highly recommended. If a manual process is used for any of the tracking requirements consideration of how this information will be stored and exchanged with another member is advised.

7.2.1 Data exchange technologies

The following is a list of the typical options available to airlines and airports when wishing to exchange baggage tracking data:

- **Data delivery brokers**: In this case, a 3rd party broker is used to deliver electronic data, invariably having well defined formats for the information (e.g., RP1745 messages such as Baggage Processed Message (BPM), Baggage manifest Message (BMM), Baggage Control Message (BCM) from an IT system of one party to an IT system of the other party is essential. These brokers generally operate over well established and supported networks and protocols.
    - **Considerations**: The main benefit of using a broker is the low maintenance in terms of connectivity, support, and continuity that would be required in maintaining direct links to all parties with whom data could be exchanged. A broker also generally enables real-time communication of tracking events. A disadvantage is that such data delivery services may come with usage charges. Furthermore, on-demand exchange of communication, where the request is also transmitted through the broker, is less commonly supported by brokers.
- **Point-to-Point data links**: Point-to-Point would generally require a bilateral agreement with the exchanging members establishing direct communication paths. Communication and message protocols can be standard or customized, based on the needs of the members doing the exchange.
    - **Considerations**: The benefits include the ability to establish direct communication using either standard or customized communication protocols and message formats, which can also more easily support additional data fields. Point-to-point data links support real-time communication and the ability to customize the link provides opportunity to implement on-demand communication. Although there may be a cost in setting up the links and the bilateral software, this is generally a cost-effective way to exchange data with regular partners, though customizations to formats or request-response protocols may increase cost.
- **Community repository**: One party can collect, store, and provide access to baggage tracking data for multiple parties. The repository could be a common-use system (e.g. BRS or BHS) at an airport or a specific bag tracking data repository managed by an alliance or group of airlines.
    - **Considerations**: Although there may be little or no direct data movement between two parties, access through controls in a repository allows interested parties to connect and extract their portion of the common data as and when they require. Depending on the controls, this could be done real-time, on a batch basis, or on an as-needed basis. As with any system with multiple parties, proper data-access permissions need to be enforced. In most instances, the party providing the common data generally has no substantial costs to making the data available, assuming the repository already has that capability, although the extracting party may have charges to pay (e.g. data delivery or extraction charges, etc.).
- **Email/Fax**: It may be a form of point-to-point, but email and fax are still technologies that are open to stakeholders to exchange data of common interest for Resolution 753 purposes.
    - **Considerations**: Although low to zero cost, email and fax do not support most of the goals of the Resolution. They can provide evidence in a manual proration process, but little else. This is

primarily due to the additional manual effort on the part of the sender to prepare the information being exchanged, and the complexity for the receiving party to extract and make efficient use of the information.

7.2.2 Data exchange formats

The most important aspect of any message format chosen to exchange data is that both the provider and receiver of the exchanged data are working to a common understanding of the data arrangements within the format. Again, there are a number of typical options open for the exchange of baggage tracking data between parties.

- **RP1745 formatted messages:** Baggage Source Messages (BSMs), BPMs, BMMs are all possible formats for exchanging check-in, tracking, sorting, screening and loading data.
    - **Considerations:** This is the recommended message format for real-time or batch data exchange, e.g., on completion of flight processing. For data exchanges on-demand, however, this format may not be as effective.
    - **Note:** Important changes have been made to RP1745. Revisions include changes to '.J' processing information and also the processing information data element code set in attachment "A", along with a number of example messages[5]
- **Baggage XML messaging:** The baggage XML messaging schema is published and the latest version is available through the GOXML toolkit published as part of the Airport Handling Manual.
    - **Considerations:** Baggage XML will become a new data exchange format and will modernize the current legacy standards for baggage, which will lead to a better baggage performance and lower airline costs. Note that XML messaging formats are not yet in operational use.
- **CSV files:** Comma Separated Values (CSV) is a standard, flexible format, and is relatively easily processed by standard desktop tools, as well as being relatively human-readable.
    - **Considerations:** This is the recommended message format for emailed data exchange, if used. The structure of the data within the CSV would need to be defined and agreed-to between the members exchanging the data.
- **Other structured data formats:** Many other data structures can be used, particularly for point-to-point data links. Possibilities include XML and JSON.
    - **Considerations:** For point-to-point data links, if RP1745 messages are not used, the custom format will most likely fall into this category. Customizing the format in this way may allow for more efficient delivery, batch delivery, or to meet another specific need.
- **Paper/PDF:** Neither paper or PDF are generally suitable for automatic processing by electronic means and would generally be reserved (though not recommended) for when email or fax is the delivery protocol.
    - **Considerations:** The receiver will typically work manually with the data provided; further processing would be required to realize any but the most cursory benefit.

[5] The full text of RP1745 will be contained in the IATA Passenger Services Conference Resolutions Manual (PSCRM) 38th Edition published on 1st June 2018.

8. Realising the benefits of baggage tracking

Resolution 753 is not just intended as an obligation on member carriers, but more importantly, as a means of driving improvement for the individual carriers and within the baggage operations of the industry as a whole. This section outlines specific examples of how the current scope of Resolution 753 can actually deliver some of these benefits through the use of the tracking data beyond simply having the information on file for compliance. The benefits will be determined by the quality of data available.

The section covers the following topics showing different scenarios when applicable for illustration purposes:

- Preventing baggage mishandling
- Root cause analysis of mishandling
- Ensuring fairer proration of mishandled bag charges
- Improve on-time performance
- Faster mishandled baggage repatriation
- Fraud prevention/reduction
- Measuring baggage performance
- Better passenger experience
- Baggage tracking data to internal airline staff

8.1. Preventing baggage mishandling

Many of the causes for mishandling baggage cannot be easily prevented, but there are situations where bags are physically at an airport as departure time approaches, but its actual location is unknown to those with decisions to make.

8.1.1 Scenario 1: Transfer bags delivered to arrivals hall

A flight arrives, a transfer bag is mixed with terminating bags in a ULD and the loaders deposit the ULD contents on the appropriate arrival belt. In the meantime, the departing flight is 45 minutes from departure and the bag has not been seen at makeup. End result: bag is left behind.

Clearly, if the loaders of the departure flight were aware that the transfer bag was on the arrival belt, they could dispatch someone to collect it before flight departure.

Preventing this mishandling

- Airport or airline implements arrival scanning (automated or manual) to record the Resolution 753 tracking point – delivery of bag to passenger.
- Data from this tracking point is transferred in near real time, via BPMs, to the local BRS where the bag locations, contained in the BPMs, are recorded and presented for each bag.
- Baggage loaders, through the BRS become aware of the "last location" of the missing bag and can save the bag from mishandling, time permitting.

8.1.2 Scenario 2: Terminating bag in sorting system

This is the reverse scenario, where a terminating bag is placed on the sorting system with transfer baggage rather than being placed on the arrival belt. When the passenger files the missing bag claim in the arrivals hall, unaware of the bag's presence at the airport, the agent completes the file and the cost of a mishandled bag will be incurred.

Avoiding this revenue leak.

- Airlines work with the airports (if necessary) to gain access to BPM data from the sortation process to cover their Resolution 753 obligation for recording the transfer of baggage between member carriers.
- Data from this tracking process is made available to the baggage tracing system so that when a tag number is entered, the agent can view the last activities recorded for that tag.
- Rather than complete the delayed bag claim, the agent can request a staff member to retrieve the bag from the sortation process and allow the passenger to leave with their luggage in hand.

8.1.3 Scenario 3: Making the correct depart/wait decisions

A late arriving flight may have a quantity of bags that are due to transfer to a flight that is approaching departure time. The transfer passengers can be collected and expedited to their departing flight, but the bags may end up taking the normal handling process. At departure time, the bags have not appeared and a decision is made to close the flight for further baggage handling, despite the fact that the bags were injected into the sorter already and are only a couple of minutes away from the makeup area.

If the ground staff knew that the bags were offloaded and injected in good time, the flight may have been able to wait those few extra minutes for the bags to be delivered.

Avoiding leaving bags behind.

- Airlines work with the airports (if necessary) to gain access to BPM data from the sortation process to cover their Resolution 753 obligation for recording the transfer of baggage between member carriers.
- Data from this tracking process is made available to the baggage reconciliation system so that loaders are aware of the time and location of injection of the transfer bags.
- Seeing that the missing bags were injected and are on their way, the ground staff can make better decision on leaving without missing bags, or not.

8.2. Mishandling root cause analysis

For an airline that is willing to invest in baggage data analytics, the extra tracking points that Resolution 753 will introduce will allow the prospect of spotting trends in mishandling as well as focusing in on systematic causes of mishandling that could be addressed. This type of analysis does require data to be available on the specific bags that were mishandled (re-flighted, recorded in baggage tracing system etc.).

8.2.1 Scenario 1: Comparing injection time with mishandling rates

When flight connections are short, it is imperative to have the transferring bags delivered to the sorting process in a timely manner, with the assumption that once in the sortation process, all should be fine. However, sorting systems have different drop points and the time from drop point X to makeup area Y can vary significantly.

It would be invaluable to have statistics that shows, over a certain period of time, that bags dropped at certain default injection points within X minutes of departure had a greater rate of mishandling. This could then be used to set new operating procedures for short and hot connecting bags, so that they are processed in a manner and at times that reduce their likelihood of being mishandled.

Required data:

- Information on actual re-flighted bags from BRS and DCS re-flighting and/or baggage tracing system files.
- Tracking Point from injection to sortation process - recording the transfer of baggage between member carriers.
- Scheduled and/or actual flight departure times.

8.2.2 Scenario 2: Validating the baggage segregation processes

We have seen earlier that transfer bags can sometimes be accidently mixed with terminating bags, and visa-versa. But is this happening more that it should be? Is it happening on bags coming in on certain arriving flights and by how much, compared to properly segregated bags, is this increasing the rate of mishandling?

The answers to these questions can facilitate a carrier to improve or optimise the rules it has set for the segregation of baggage, particularly at outstations, or it may highlight certain stations that are systematically not following the segregation procedures set by the carrier.

Required data:

- Information on actual re-flighted bags from BRS and DCS re-flighting and/or baggage tracing system files.
- Loading manifests - recording the bags that were loaded on departure (Resolution 753).
- Tracking data from injection to sortation - recording the transfer of baggage between member carriers (Resolution 753).
- Tracking data from arrival bag delivery - recording the delivery to passengers (Resolution 753).
- Scheduled and/or actual flight departure times.

8.3. Ensuring fairer proration of mishandled bag charges

When a proration claim comes from one carrier to another, due to the mishandling of a shared interline bag, the payment of the costs are shared, by default, in a ratio of the mileage flown. However, if it can be demonstrated that custody of the bag was passed from carrier A to carrier B at an agreed exchange point (i.e., a transfer bag tracking point for Resolution 753) then carrier A could effectively reject the claim if it can be seen that this exchange took place well before the onward flight was due to depart.

Thus, recording both the exchange of custody between carriers (Resolution 753 obligation) and the time at which it occurs can allow for a more equitable sharing of mishandling charges between interline partners.

8.4. Improve on-time performance

In the sections above, we have shown how information from Resolution 753 tracking points could be used by ground staff to help decided to wait for bags that have been seen at the airport. Being able to make a decision to wait or leave based on knowledge of the current handling process of bags at the airport will undoubtedly allow for less flight delays due to missing baggage. This demonstrates the value of making the Resolution 753 tracking points for changes of custody at an airport available to baggage handlers as they process the departing flights.

8.4.1 Knowing what's truly on-board an arriving flight

Today, most carriers employ baggage IT systems that can show the number and types of bags that are expected to transfer from an arrival flight of an interline carrier to their departing flight. However, what if some baggage is left behind at the origin and what if the baggage belongs to a group of first class, high value passengers?

Well, if those handling the connecting flight are aware that the flight has arrived and that the passengers have boarded, they are very likely to wait those extra minutes for the bags to show up and get loaded. However, these bags are never going to show as they were not loaded at the arrival station.

The Resolution 753 solution: if the carriers both implement their obligation under Resolution 753, and both are willing to exchange the information on loaded interline bags with each other in a timely manner (e.g. BMMs or BPMs), then the departing carrier can have this data available in their baggage reconciliation system at departure time. This allows those handling the flight to be aware that the bags are not going to show. Of course, the bags are mishandled, but it does not have an additional negative impact of causing the delay of an entire flight due to lack of shared awareness.

8.5. Faster mishandled baggage repatriation

When bags are mishandled, it is usually the task of specialist tracing agents to reach out and search for information about the bag and its last know location. There are several reasons why this process can result in wasted time in getting the bag back to the passenger:

- Those with knowledge of the bag's current status are likely to be in a different country and often in a wildly different time zone (asleep).
- Current processes for locating bags may require manual investigation due to lack of tracking data.
- There is generally a time lag between a request to find a bag and a response that the bag has been found and processed.

When a carrier invests in efforts to track their baggage under Resolution 753, and the tracking methods result in baggage messages (BPMs, BMMs) being exchanged, the opportunity to share the Resolution 753 tracking data with baggage tracing teams becomes available. As tracking information (acceptance, loading, baggage exchange, and delivery) is collected to comply with Resolution 753, it can also facilitate the tracing agents' tasks to, not only know what is happening and whether further work is required on their part, but they can often provide passengers with a more positive report on their mishandled baggage.

So, rather than stating "file this baggage claim and we will contact you when we have an update", the agent might be able to state more positively that "the bag was loaded in LHR, it was seen in the system at JFK where you transferred but it missed the connection. However, our staff in JFK have already loaded it on the next flight and it should be with us this evening".

8.6. Fraud prevention/reduction

8.6.1 Deterring fraudulent missing bag claims

If, as suggested earlier, a carrier is able to arrange to have their Resolution 753 tracking and loading touchpoints made available in near real-time to their baggage tracing system, then the presence of "Bag delivered to arrival belt 1" information on their screen when a passenger reports a delay or missing bag, would certainly be useful in deterring those considering fraudulently claiming to not having received their baggage.

8.6.2 Spotting systematic pilferage

With the Resolution 753 tracking data being delivered to an analytical database, reports can be created to cross reference pilferage cases with the times and locations of baggage loading, tracking and exchange which may allow the focus of serial pilferage to be directed at certain locations and times at particular airports. (E.g. bags involving pilferage at airport X consistently took longer through sorter Y than the norm, and consistently between the hours of 19:00 and 23:00).

8.7. Measuring baggage performance

There are some critical areas in the baggage handling process where the performance of airlines, airport and GHSPs are measured. As airlines roll-out the tracking points needed for Resolution 753 compliance, more accuracy in relation to key performance indicators (KPIs) can be achieved.

8.7.1 Baggage delivery times

A full implementation of the tracking of bags to arrival belts (delivery to passengers) together with the delivery of the data to an IT system for analysis can allow more information to be derived at baggage delivery time:

- First and last bag times: a KPI that is typical in the industry but is not currently measured at all airports.
- Quality of service: some carriers want to have priority bags delivered first but often have no means of determining how frequently this objective is being compromised.
- Spread of late delivered bags: A first bag being delivered late could still mean that all the other bags were delivered before the target time for the last bag. Equally, a first bag being delivered on time, could still result in the bulk of the remaining bags being delivered late. By individually recording the baggage delivery of each bag, more advanced performance statistics can be measured, and process improvements made accordingly.

8.7.2 Late baggage loading

If the Resolution 753 requirement to record the loading of bags on departure is implemented using an automated system like a BRS, then it is likely that the times of the loading as well as the fact that the bags are loaded will also be available for analysis.

By analysing this information, it should be possible for a carrier to spot the level of occasions where large percentages of bags, checked-in in good time, were not loaded as the time of departure approached. Cross checking such statistics with the incidents of late departing flights and times might indicate a lack of baggage handling resource at particular times and airports but it could also highlight poor baggage handling procedures that are risking the airlines on time performance ratings.

8.8. Better passenger experience

Clearly, any initiative that results in better baggage handling performance and reductions in baggage mishandling will implicitly result in a better passenger experience. Whether it's less mishandling, faster mishandled bag repatriation or simply more confidence to offer the passenger that their bags are safe, Resolution 753 will indirectly improve passenger experience.

In saying that, with the introduction of more baggage tracking, and in particular for those carriers that comply to the resolution using more electronic, automated and real-time techniques, opportunities will open up to be able to share baggage handling updates with passengers as they continue on their journey.

The Resolution 753 tracking points could allow more carriers to include a "Check my bag" option in their mobile apps to show passengers:

- "your bag was checked-in"
- "Your bag has been sorted"
- "your bag is loaded"
- "your bag has been delivered to carousel 6"

Carriers may feel that this is open to negative results, in cases where the bag does get mishandled, but it is also the case that 99.4% of the time, their passengers will get "positive news" about their bag as they complete their trip.

Also, surveys show that passengers want to have more visibility regarding the very emotional topic "where is my baggage". Giving the passengers direct access to selected bag status information and thus full transparency, will make passengers happier and more relaxed. It will also relieve ground staff from constant queries about the baggage status.

The information could be transported as a push information (e.g., a push message or mail notification when the status changes) or via a tracking feature in the airline app or airline website.

However, this only works when there is tracking data available at most airports, otherwise, it could turn into a negative experience, when passengers are used to getting this information at airport/from airline one and suddenly there is no information at airport/from airline two.

Thus, the airport passenger experience performance can be gradually measured against the availability and proper usage of infrastructure to make the baggage status available to the passengers. Various analytics can also be made available from the tracking data to make a more informed business decision that can lead to resource optimization and planning for both airports and airlines.

Equally important, in this era of self-service where airlines have less access to their passengers, such facilities will increase the usage of airline mobile apps, ensuring that the airline continues to have a means of communicating with their passengers, even those that wish to do an entire self-service journey.

Tracking information can also be used in the baggage claims process. Normally, complaints and claims are handled through airline baggage services or the GHSP agents globally. With baggage tracking information, airlines can also decide how they want to inform their customers:

- Customers could be getting more information quickly about their baggage delivery.
- Some claims could be treated via airline websites and/or mobile applications avoiding waits at the baggage service office.

- Complex baggage claims could be more customized to ensure everyone's' needs are met.
- When there is highly reliable tracking information, automatic process for baggage irregularities could be implemented. E.g., automatic customer notifications in left behind cases. automatic reporting of delayed bags etc.

8.9. Baggage tracking data to internal airline staff

If, when complying with Resolution 753, an airline is able to centralise all the tracking data relating to their baggage network operations, there are substantial opportunities to share this information internally to improve customer service and operations.

8.9.1 Baggage claims office

Providing baggage claims officers with direct (online) access to all baggage tracking data can allow them to validate claims more effectively, while also ensuring that the payments are justified.

In the case of proration evaluation, with custody exchange locations and times being readily available, an officer should be able to accept or reject another carrier's claims for proration using more precise information than is currently available to them.

8.9.2 Baggage service desk

When passengers are reporting a mishandling incident, an airline with a centralised data store of near-real-time tracking should be able to implement a direct connection to this data, either through an integration with the baggage claims system or as a standalone system.

With this direct data access, a service agent should be able to:

- Identify whether the bag may simply be misplaced at the arrival airport.
- Report on the last know location of the bag (providing the customer with confidence).
- Report that the bag is already found and loaded on the next flight from the origin.

8.9.3 Customer service agents

Even if an airline is not willing to provide passengers with direct access to live baggage tracking updates, having a central data store and application interfaces will allow customer service representatives in a call centre or based at the airport to be able to give updates on baggage handling to passengers who may have concerns.

9. Baggage tracking partners

9.1. Potential tracking data providers

Within a member airline's operating network, some stations are likely to have their own infrastructure capable of providing tracking data. This includes BHS, BRS or arrival tracking facilities provided by an airport, a partner airline or a GHSP.

Where this infrastructure meets the requirements of Resolution 753, it shall be the preferred practice to use such infrastructure. Widespread use of existing tracking and tracing solutions is key to cost-effective implementation for airlines and other stakeholders.

Potential Data Provider	Data Useful to Member Carrier	Supported Resolution 753 Requirement
Airports	Acceptance of bag at bag drop. Tracking data from sorting process (including exception handling)	Acquisition from passenger
	Injection of transfer bags	Delivery and acquisition between carriers
	BRS loading operations	Delivery on to aircraft (loading)
	Common use arrival tracking facilities	Delivery to passenger
Interline airline	Agreed exchange point scanning	Delivery and acquisition between carriers
	Baggage loading of interline bags at up-line station (for tail-to-tail ULD transfer)	Delivery and acquisition between carriers
		Delivery on to aircraft
GHSPs or Handling Partner	Agreed exchange point scanning	Delivery and acquisition between carriers
	BRS loading operations	Delivery on to aircraft (loading)
	Recording of mishandled bag Delivery by couriers	Delivery to passenger
	Off-airport acceptance, transfer or delivery of bag	Delivery and acquisition from passenger or transfer between airline and a third party (e.g. intermodal transportation).

Use of standard baggage service messages, such as those described in RP1745/RP1755 or future standards, is preferred.

9.2. Airports

Airports have a key role to play in generating of Resolution 753 data; and, importantly, can use the data generated for the resolution to drive improvements in their own processes.

Airports compete for airline business. Airlines are more likely to operate at airports that have a good baggage handling and tracking infrastructure that supports acquisition and delivery, and can provide that information to the airlines; especially if that data can be provided in real time. A shared infrastructure is also much simpler to manage for an airport than having multiple systems physically competing for space around the baggage belts. An airport that can help provide the data needed by a member carrier for compliance with Resolution 753 will be seen as a valuable airline partner.

Baggage tracking data can also be used to great effect to support operations at the airport itself. For instance, it could be used to monitor passenger baggage flows through an airport; to prioritise baggage for hot connections; and to manage and improve general performance of the BHS and processes. Accurate data can also be used to provide information to all stakeholders about the location and status of baggage; and it could support more accurate charging for delivered BHS facilities as the tracking figures for the airport and the airline should come from the same source.

Some airports may operate the baggage system (or sub-systems) themselves, other may outsource some elements in the BHS to the OEMs or other third parties.

Another point to mention is that, for airports, it would be good to capture the data flows for the baggage scans when they are scanned at the four points (Acceptance, Loading, Transfer, Delivery) – i.e., which stakeholders use that same scan information (government agencies for HBS/ETD or customs / agriculture).

9.3. Interline airlines

Most mishandling occurs during transfer, especially between interline airlines. Airlines that can exchange accurate, trusted data can support each other by simplifying the transfer process. For example, the resolution calls for tracking of custody change between airlines, which in some cases will be recorded by both the inbound and outbound airlines separately. If a single agreed tracking point provided by one of the airlines (or their providers) could demonstrate that custody change, this would reduce and simplify the amount of data generated and, in most cases, simplify the operation by reducing the number of physical scans required.

In addition, providing a detailed and reliable inventory of bags can also open up opportunities for safe and secure tail-to-tail handling and thus reduce minimum connection times.

9.4. GHSPs or handling partners

GHSPs or handling partners are generally responsive to the requirements of the airlines they serve or partner with. In most cases, they will use airport or airline mandated systems and services. In some cases, however, handlers procure their own systems; where this is the case, they can help member airlines gain the same benefits described above. Handling partners may also be non-airline entities such as hotels, train companies, shipping companies or other.

The same data used by airlines and airports can also be used by GHSPs to demonstrate and improve operational efficiency and effectiveness and enhance customer experience.

10. Best practice for infrastructure

So far the guide has discussed the benefits of recording and exchanging the tracking data mandated by Resolution 753 together with discussion on the merits of automated, real-time data exchange. While implementing these strategies will maximize the benefits of end-to-end baggage tracking and tracing, they are not cost effective for all operations; in particular for smaller operations (whether it is a smaller airport, or a satellite operation at a larger airport).

This section discusses possible strategies for operations of different sizes and offers suggestions for best practice in various different cases. We welcome any feedback from you about your future plans for implementation; the IATA baggage team can be reached by email on baggageservices@iata.org

This section aims to address the best practices for the infrastructure required for the implementation of the baggage tracking technologies, processing computer, processed data scaling from small to large operations to ensure reliable and secure operations.

The best practices for the infrastructure shall include but are not limited to the following:

a. Redundancy & resiliency
b. Scalability
c. Security
d. Data back-up & disaster recovery
e. High availability
f. Resilient network infrastructure
g. Compliance with regulatory standards
h. Seamless system integration
i. Monitoring & analytics
j. Disaster preparedness

10.1. Evaluating tracking strategies

The decision on which tracking strategy to adopt will vary from airline to airline, and station to station. It is possible, and indeed likely, that an airline will use many different approaches across their network, and also that different airlines at a given station will adopt different strategies based on the scale of the operation and the systems used by that airline (such as availability of centralized systems).

10.1.1 Considerations

The points below outline the sort of questions that should be asked of the airport in question to properly evaluate the best approach when considering a tracking strategy. This list is by no means exhaustive.

- Does the airport have a BRS; or are bags otherwise already scanned by other common use systems at the airport?
- Is the data in any existing airport system available for export to a third party; and if so, how can this data be obtained (for instance, IATA standard BPM, BMM, CPM; web service; API; spreadsheet)?

- Is a message broker available, either within the airport environment or on a wider scale?
- Is Wi-Fi widely available at the baggage handling points (load, transfer or arrival) and/or on the ramp; or if not, is Wi-Fi available elsewhere, such as at the gate within the terminal building?

10.1.2 Possible approaches

An airline can make an informed decision on the best approach to take for a given station, based on the considerations above, plus other factors, such as availability of a centralized system for storing tracking information or availability of scanning at the airline's hub operation. Several possible approaches are listed below; and again, this list is by no means exhaustive.

1. **Real time scanning via BRS system (Departure and Arrival)**
    - Bags scanned in real-time as each bag is loaded/offloaded.
    - Data acquired from airline system using standard interface and stored locally or passed to centralised system.
2. **Offline scanner (Departure and Arrival)**
    - Scanner records bag tags as each bag is loaded/offloaded.
    - Records uploaded periodically or post departure to centralised system.
    - If no communications infrastructure available, scanner is taken back to hub airport and uploaded retroactively.
3. **Departure scanning - based on bingo sheet**
    - "Confirm departure load" by scanning bingo sheet; could be scanned at departure airport, arrival airport (using Bingo Sheet copy sent with the aircraft) or elsewhere (using emailed copy)..
4. **Departure scanning – based on exception reporting**
    - "Confirm departure load" by exception reporting; Nil bags are left behind, post departure = 100% uplift
    - This is a valid approach only when there is no overlap of build or simultaneous flights at baggage make up.
    - Should not be used in conjunction with arrival exception reporting.
5. **Arrivals scanning - based on departure load (arrival at hub operation)**
    - "Confirm arrival" by scanning; Scanner records bag tags on arrival.
6. **Arrivals scanning - based on departure load (arrival at smaller operation)**
    - "Confirm arrival" by exception reporting; Nil bags left on the aircraft = 100% bags arrived.
    - This is a valid approach only when there is no overlap of arrival or simultaneous flights, meaning there is one flight at the baggage reclaim.
    - Should not be used in conjunction with departure exception reporting.
7. **Arrival & Transfer confirmation – by recording the bags on CCTV**
    - A method to determine which bag is which within the CCTV system will help enable tracking of individual bags.
8. **Arrival & Transfer confirmation – by manual recording of bag tags (e.g. Excel spreadsheet) to record bag status as arrived or transferred**
    - Match bags tags against departure records.

10.2. Case studies

Appendix C contains a number of airline and airport case studies describing possible best practice for operations of different sizes. More case studies will be added in later releases of this guide; please forward any submissions to baggageservices@iata.org

11. Data charter

The baggage data that is collected during the implementation of Resolution 753, particularly when it comes to data being shared, is an area that raises natural concerns among IATA Member Carriers – even if those carriers are both willing to exchange baggage data. Carriers have an overall responsibility for the exchange of information as required by the resolution. The opportunity for misuse or mishandling of sensitive data is clearly present, and so the Resolution 753 Data Charter is intended to be a set of conditions that Member Carriers agree to adhere to. The purpose is to ensure that those providing data have confidence that it will not be mismanaged or misused; while those receiving data are aware of some basic responsibilities in relation to the data being provided.

Terms of the charter

In the context of IATA Resolution 753

- A checked-in *bag's journey* is deemed to include the airports, flights and baggage handling systems and processes that it must go through, from initial acceptance from a passenger to the return of that bag to that passenger.
- The *primary stakeholders* during a bag's journey can be any/all of the following:
    - Any operator that is expected to transport or handle the bag during any part its journey.
    - Any airport or terminal management organization ("Airport") that is expected to process the bag through an airport or terminal under its control.
- Ground handling service providers (GHSPs)/Baggage Service Providers (BSPs) are organizations that may be appointed by a primary stakeholder, through the provision of baggage handling systems and services, to process their baggage and/or associated baggage handling data.
- For simplicity, references to IATA member/operator and primary stakeholders within this charter also apply to GHSP/BSPs acting on their behalf,
- An IATA member may receive baggage handling data from primary stakeholders other than another IATA member (e.g., Airports, non-IATA members). The terms of this charter also apply to data received by IATA member from such organizations.
- When baggage handling data is captured by an IATA member, they are obliged to provide this data to other IATA members and non-IATA members that are expected to transport or handle the bag during any part its journey.
- Baggage handling data should be provided in a manner and format that is agreeable to all parties involved.
- For interline bags, as a minimum, an IATA member should be capable of sharing data with other interline IATA members. This data is defined as:
    - acceptance of the interline bags, from the passenger or another primary stakeholder;
    - loading of the interline bags on the departing flight;
    - delivery of interline bags to either a passenger or another primary stakeholder.

- When an IATA member is receiving baggage handling data from another primary stakeholder, they must ensure that:
    - delivery of the data has been approved by the primary stakeholder that created or captured the data.
    - data, or information derived from the data, is not used in a manner that would compromise the reputational or commercial interests of the primary stakeholder that has provided the data.
    - data or information derived from the data, is not provided to any third party other than a primary stakeholder, against the expressed wishes of the primary stakeholder that provided the data.
    - any cost for the exchange of data is borne by the receiving IATA member, unless otherwise agreed.
    - data is stored in a safe and secure manner.
    - data is managed in a manner that conforms to national and international regulations in relation to data security, retention and privacy.
- When an IATA member is providing baggage handling data to another IATA member, they must:
    - make every effort to provide the data in a manner, format and at a time that best suits the needs of the receiving IATA member particularly when the receiving carrier has accepted to pay any costs associated with the data exchange.
    - ensure that the data provided relates specifically to the interline bags that are expected to be handled by the IATA member receiving the data.

12. Appendix A – Frequently Asked Questions

IATA will capture in the Frequently Asked Questions of the implementation guide feedback received from external stakeholders. This is a non-exhaustive list that will be updated regularly.

Please provide your feedback to baggageservices@iata.org

Feedback can also be done regarding other aspects of the implementation guide.

Communication and IATA support to industry

12.1. How can airports support airlines with compliance to Resolution 753?

Airports may require airline data, such as terminating BSMs, to aid the airline in compliance with Resolution 753. Airlines should engage with airports as required to enable this capability.

12.2. How does IATA support airline members in getting ready for the Resolution 753 implementation?

IATA has developed different resources such as:

- IATA Resolution 753
- IATA Resolution 753 implémentations plan Template
- Baggage Tracking Implementation Guide
- Regional workshops
- IATA Readiness Certificate
- Consultancy Services
- Training Baggage Tracking - Implementation and Compliance
- Resolution 753 Tracker
- Webinars

For information on the resources and how to get the information please contact: baggageservices@iata.org

12.3. Does IATA organize communication for airlines?

IATA has been, and will continue to be, engaged in various global campaigns related to baggage tracking with the goal of reducing mishandled bags and increasing efficiency in baggage operations.

12.4. Could IATA take the lead and communicate with different airport authorities?

IATA is collaborating closely with Airport Council International (ACI) World to communicate key messages regarding how airports can support airlines to meet their Resolution 753 obligations. This is conveyed to airports through different channels (e.g. presentations at ACI industry meetings and conferences).

For additional information, please go to:

IATA: www.iata.org/baggage

ACI: https://aci.aero/

12.5. What are the consequences if an airline is not Resolution 753 compliant ?

IATA does not monitor or verify that airlines have implemented or comply with our resolutions. IATA is effectively an industry group of airlines that work together for mutual benefit, and like any group, when all the members agree to do something then it should be done.

There can be some consequences for failing to implement IATA Resolution 753:

- **Prorates:** It is intended, but not yet actioned, that airlines that cannot provide tracking data for their baggage should bear the entire cost of baggage claims for their interline journeys.
- **Interline agreements:** Some airlines are placing a requirement for the sharing of baggage data in their interline agreements, and therefore this could be a key capability for maintaining those agreements.
- **Missing out on IATA Resolution 753 benefits:** It is important to remember that the resolution provides medium to long term benefits for airlines and airports. Some of the benefits show a direct relation to mishandling reduction, data analysis and passenger satisfaction improvement.
- **Passenger experience:** Passengers are increasingly demanding visibility of their baggage throughout their journey. It is becoming a trend now to track their baggage at times using independent technology operating outside of the airline's baggage system. Providing data from the baggage tracking system satisfies the passengers' need for information about their baggage without them needing to look for independent solutions.

Therefore, each member should very carefully consider their approach to implementing IATA Resolution 753. We would hope that all members have a plan for implementation and would be able to demonstrate their commitment to baggage tracking.

Industry working together

12.6. Does IATA organize joint discussions inside and outside alliances for common implementations?

IATA organizes baggage tracking workshops to raise awareness on Resolution 753 in different regions. The BWG is also a unique forum where experts from airlines, GHSPs, BSPs and airports gather regularly to discuss and evaluate the global implementation of Resolution 753.

Given that each airport has its unique infrastructure, it is best for airlines and airports to identify the appropriate forum to discuss baggage tracking locally (e.g., Local Baggage Committee (LBC), Airline Operators' Committee (AOC).

In addition, IATA encourages airline members to seek direct support from their alliances if applicable.

12.7. How does IATA encourage joint participation between airports, vendors and airlines on innovation for baggage tracking?

Several opportunities exist to foster innovation related to baggage tracking such as:

- Industry events (e.g. IATA World Passenger Symposium, ACI-NA Annual General Meeting, AAAE/ACC Design Symposium, Transportation Review Board Annual Conference (TRB), ACI-Airports at Work, Passenger Terminal Expo);
- Industry meetings (e.g., Participants of the IATA BWG are airlines, airports, IATA Strategic Partners, in addition to IATA and ACI World).

For more information please contact: baggageservices@iata.org

12.8. Why should the industry work together for Resolution 753 if it is an IATA requirement for IATA member airlines?

Baggage tracking is a key way that our industry can continue to drive down costs and improve service at a fundamental level.

Key benefits for airlines and airports are:

- Preventing baggage mishandling
- Mishandling root cause analysis
- Ensuring fairer pro-ration of mishandled bag charges
- Improve on-time performance
- Faster mishandled baggage repatriation
- Fraud prevention/reduction
- Measuring baggage performance
- Better passenger experience
- Baggage tracking data to internal airline staff

For details on benefits see Section 8. Realizing the benefits of baggage tracking in the implementation guide.

12.9. What are the appropriate forums baggage stakeholders could use to discuss the implementation of Resolution 753?

IATA encourages airline members to engage locally with all key stakeholders involved in baggage activities early in the process in order to define together the best strategy to maximize the benefits the Resolution 753 could bring.

The forum could be an AOC or a LBC as defined in IATA Resolution 744.

Implementation of Resolution 753

12.10. What technologies are acceptable for baggage tracking?

The potential recording methods are as follows:

- Laser or Imager – Optical scanning
- Manual recording
- RFID scanning
- Optical Character Recognition (OCR)
- Other technologies: BL), NFC, Wi-Fi, GPS or other

More information on the above potential recording methods appears under Section 6.5 - Potential Recording Methods of the Implementation Guide.

In some cases, the contribution from industry providers would be required. If this is the case, a list of IATA Strategic Partners can be found under Section 18 of the implementation guide.

It is important to note that Resolution 753 does not mandate one way of doing things and is based on consistency of processes and not on technologies.

12.11. How can airlines achieve Resolution 753 for the airports without BHS/BRS?

Resolution 753 does not mandate one way of doing things when it comes to collecting, recording and exchanging the baggage data. Airlines can meet the Resolution 753 requirements by using manual processes.

For additional information on manual processes see Section 6.5.2 - Manual recording, and Section 7.2 - How to exchange baggage tracking data, in the implementation guide.

Types of baggage falling under Resolution 753

12.12. How do I know when baggage tracking is required?

As a general rule, baggage tracking is required when a bag tag number (10-digit license plate) is issued. This includes:

- Oversized and special baggage (e.g. sports equipment, wheelchairs, strollers, etc.)
- Live animals under the provision of IATA Resolution 780, Article 3 Interline Checking of Baggage
- Gate bags (see Section 15 - Appendix D - Treatment of irregularities in operations, in the implementation guide).

Airports and Resolution 753

12.13. What is the airports' role in implementation Resolution 753?

Resolution 753 places an obligation on IATA member airlines. However, in many cases, airlines will be seeking the support from stakeholders involved in the baggage journey such as airports. A successful collaboration and sharing of accurate infrastructure-related information with airlines is critical for the implementation of Resolution 753 at the mandatory tracking points. Airlines occasionally struggle with availability of infrastructure to do arrival scanning. It is important to note that despite the time pressure originating from the individual airlines' performance standards, arrival scanning is critical for the full implementation of Resolution 753. Perhaps a more efficient tracking technology can be adopted for arrival scanning if the traditional scanning method is time consuming and jeopardizes the performance requirements.

12.14. How would Resolution 753 be one key factor of airport KPI?

Baggage tracking is a key enabler not only for airlines but also for airports and the whole industry to further reduce the number of mishandled bags but also to increase efficiency in baggage operations and ultimately offer better passenger experience.

Benefits for airports:

- Add KPIs as part of Service Level Agreements (SLAs)
- Preventing baggage mishandling
- Mishandling root cause analysis
- Improve on-time performance
- Measuring baggage performance
- Fraud prevention/reduction
- Better passenger experience

For details on benefits see Section 8 - Realizing the benefits of baggage tracking, in the implementation guide.

Baggage data exchange

A lot of questions related to baggage data exchange are received, so some generic information for reference is provided below. However, it is strongly recommended for airlines to review the appropriate regulations related to data that should be adhered to when baggage tracking data is collected, exchanged and used.

12.15. Are there some data security elements to consider?

Although concerns differ from entity to entity, there has historically been resistance within the aviation industry to exchange operational data. Commercial interests, security fears, data protection concerns and regulations are all factors in this resistance. For Resolution 753, Section 11 – Data charter, has been added to this guide so that those attempting to comply with the resolution can understand the obligations of member airlines and their agents in relation to baggage tracking data management.

12.16. Are there some data protection regulations to consider?

For many years, airlines and airports have been exchanging baggage source messages (BSMs) "as needed" for the specific purpose of enabling the automation of baggage handling by all entities involved in any aspect of baggage handling. Data exchange between these parties for the purpose of BSM (Check-in) information is therefore covered by existing processes and procedures and, as such, should be considered to be already within any local or international data protection regulations.

The exchange of baggage tracking data (as opposed to check-in data) could be regarded, under this resolution, as a simple extension of this process, and could therefore be considered to be within existing agreements. However, this guide is not intended to countermand local or international data protection regulations, and all parties (airlines, airports and GHSPs) should ensure that any such data exchange is within these regulations.

12.17. Is there a risk of data privacy from baggage tracking data exchange?

It is unlikely that there would be an additional risk of contravening data privacy laws from exchanging tracking data.

The only additional information that interline carriers would likely share, beyond the content of currently shared BSMs, could be:

- When did a baggage handling event occur?
- What was the event that occurred?
- Where did the event occur?

This is even more limited by the fact that the data being exchanged is limited to:

- Handling events that are required by Resolution 753 (passenger acceptance, bags loaded on departure, transfer process and passenger delivery).

12.18. What happens if the baggage tracking information is shared with too many parties?

The only entities that could have access to newly exchanged baggage tracking data are effectively the same parties that currently receive BSMs relating to the bag being handled:

- GHSPs
- Interline airline partners
- Airports
- IT system providers appointed by airlines or airports

In the case of baggage tracking data, it is likely that the recipients of any exchanged data will only be a sub-set of these entities.

12.19. Why might an airport share data or support airlines with Resolution 753?

- **Better service to airline customers:** airlines are customers of the airport and if they are not getting the service that other airports provide, airlines may think again about where they operate from. If airports have Resolution 753 data readily available and can therefore reduce the cost for airlines in implementing their own facilities to cover the same tracking points, then airports would certainly be providing better customer service by sharing what data they have.
- **Better reputation among passengers:** If as a result of sharing their baggage tracking and loading data with customer airlines, those same airlines manage to achieve some of the benefits of that data sharing, such as reduced mishandling and better on-time performance, then the reputation of the airport will rise, together with that of the airlines operating from their facility.
- **Continued common use benefits:** Common use facilities benefit an airport in so far as the airport can gain usage revenue while also ensuring a better managed infrastructural environment. When it comes to tracking, and in particular, for those tracking points that are most likely to need new infrastructure (e.g. scanning on delivery to passenger/arrival carousel), if an airport does not implement a common use solution, with the resulting data being shared with the airlines, then airlines are likely to go ahead and implement their own solutions. This would have the potential to erode the manageability of the airport and its services while also increasing logistical complexity for support and maintenance activities.
- **Bilateral discussions:** Since airports might have critical data required by airlines for Resolution 753 fulfilment (e.g., BHS tracking data), there may be scope for airlines and airports to agree, through bilateral discussions, what tracking data could be exchanged through baggage information messages or reports.

12.20. To which privacy law should IATA Resolution 753 comply?

IATA Resolution 753 does not comply to any specific privacy law. The bag tag number (10-digit license plate) is mandatory in all cases when recording tracking points. Time is also recommended, especially in case of offline scanning, but without having any passenger information whatsoever.

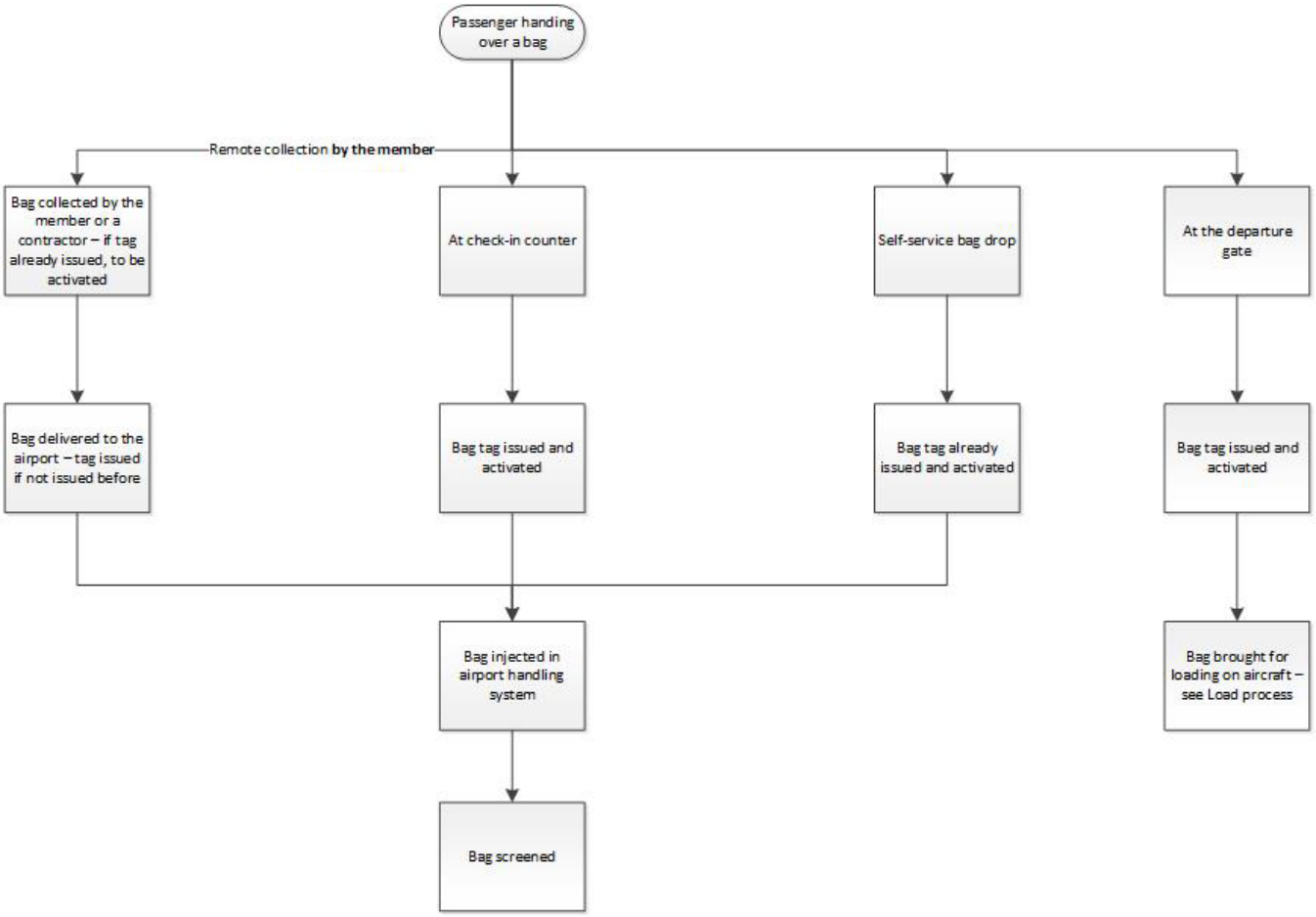
For Resolution 753, Section 11 – Data charter has been added to the baggage tracking implementation guide so that those intending to comply with the resolution can understand the obligations of member airlines and their agents in relation to baggage tracking data management.

As best practice, IATA also strongly recommends for airlines to review the appropriate regulations related to data that shuld be adhered to when baggage tracking is collected, exchanged and used.

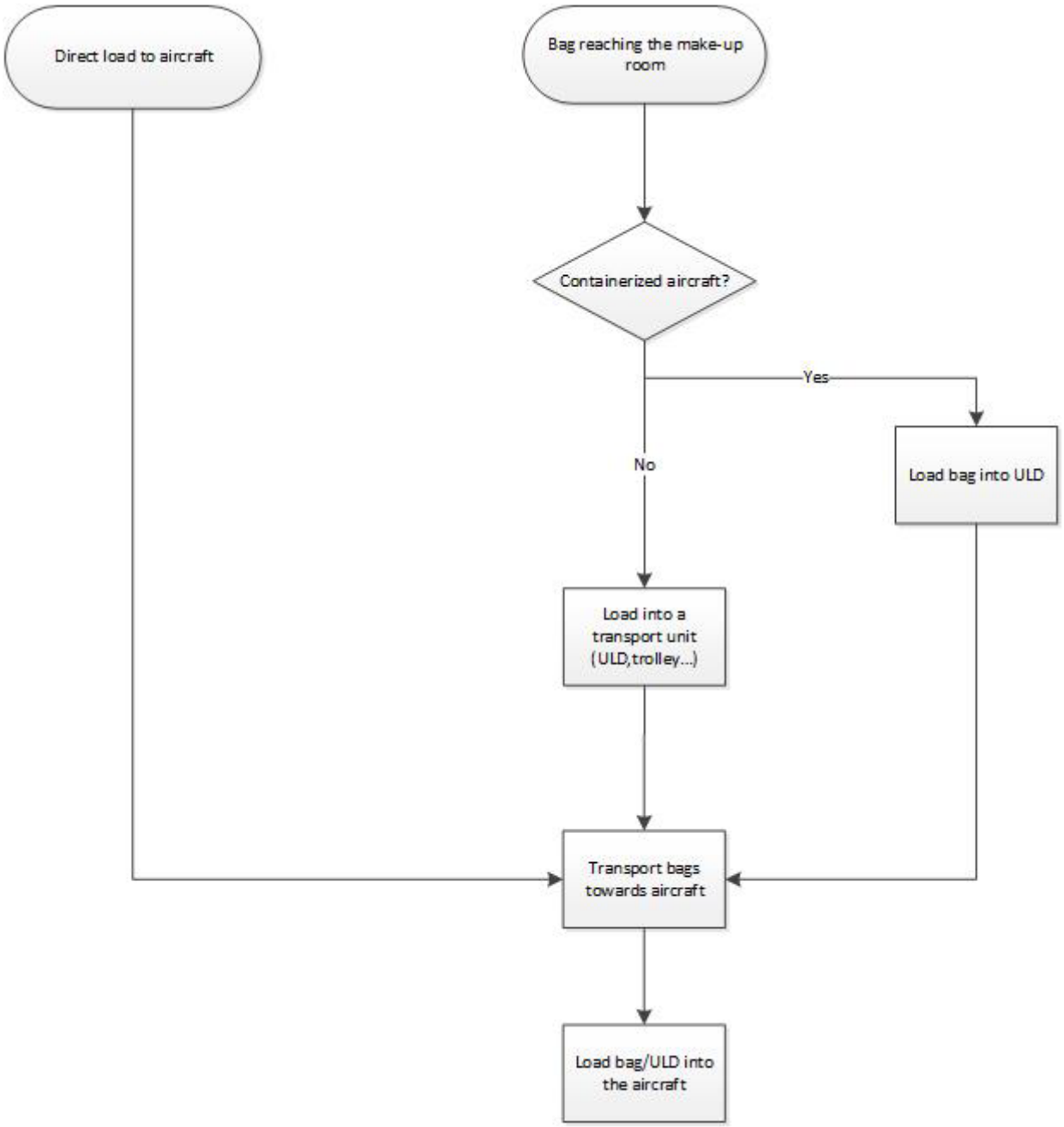
13. Appendix B – Sample process views

The following section outlines typical acceptance, load, transfer and arrival processes.

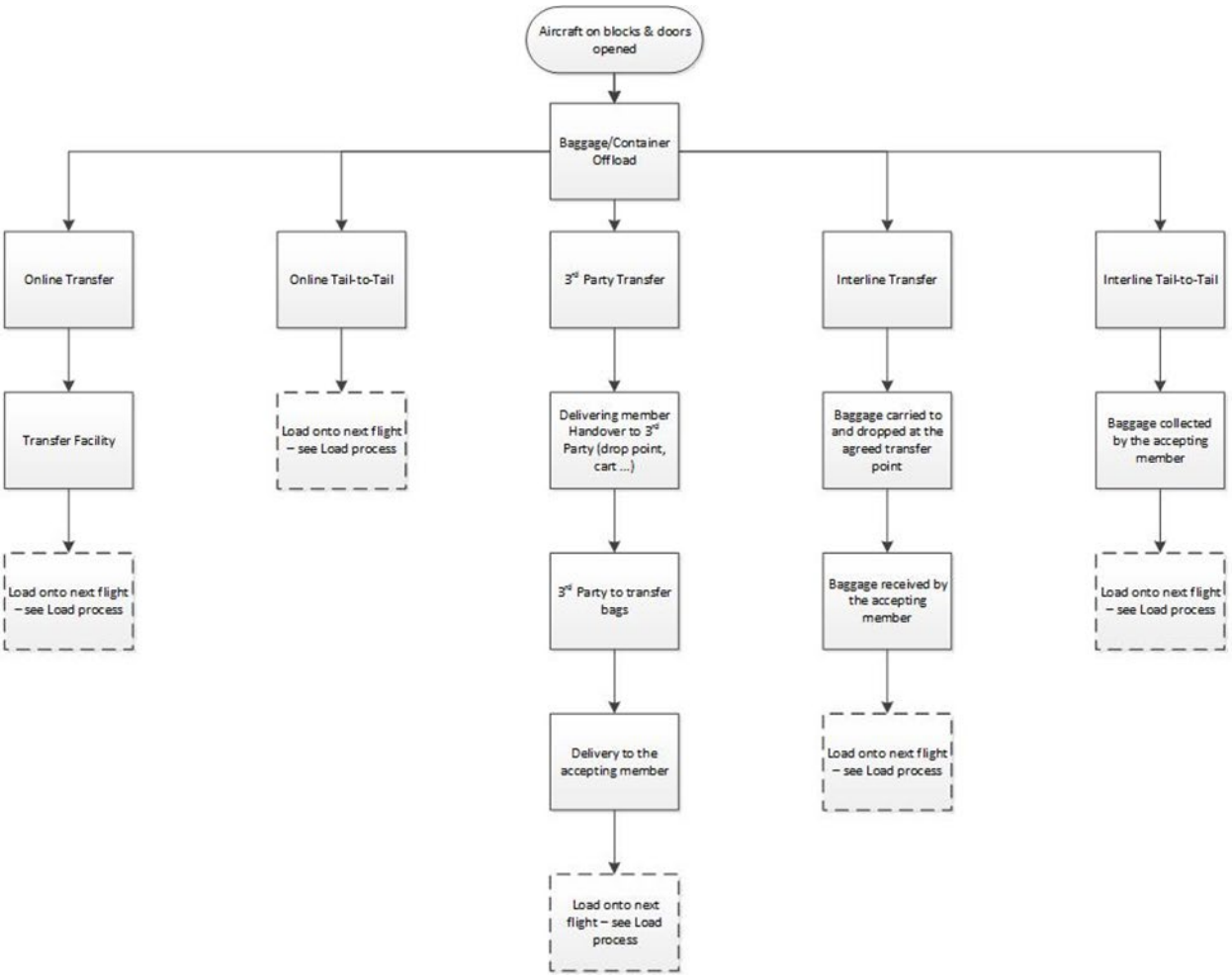
13.1. Acceptance process



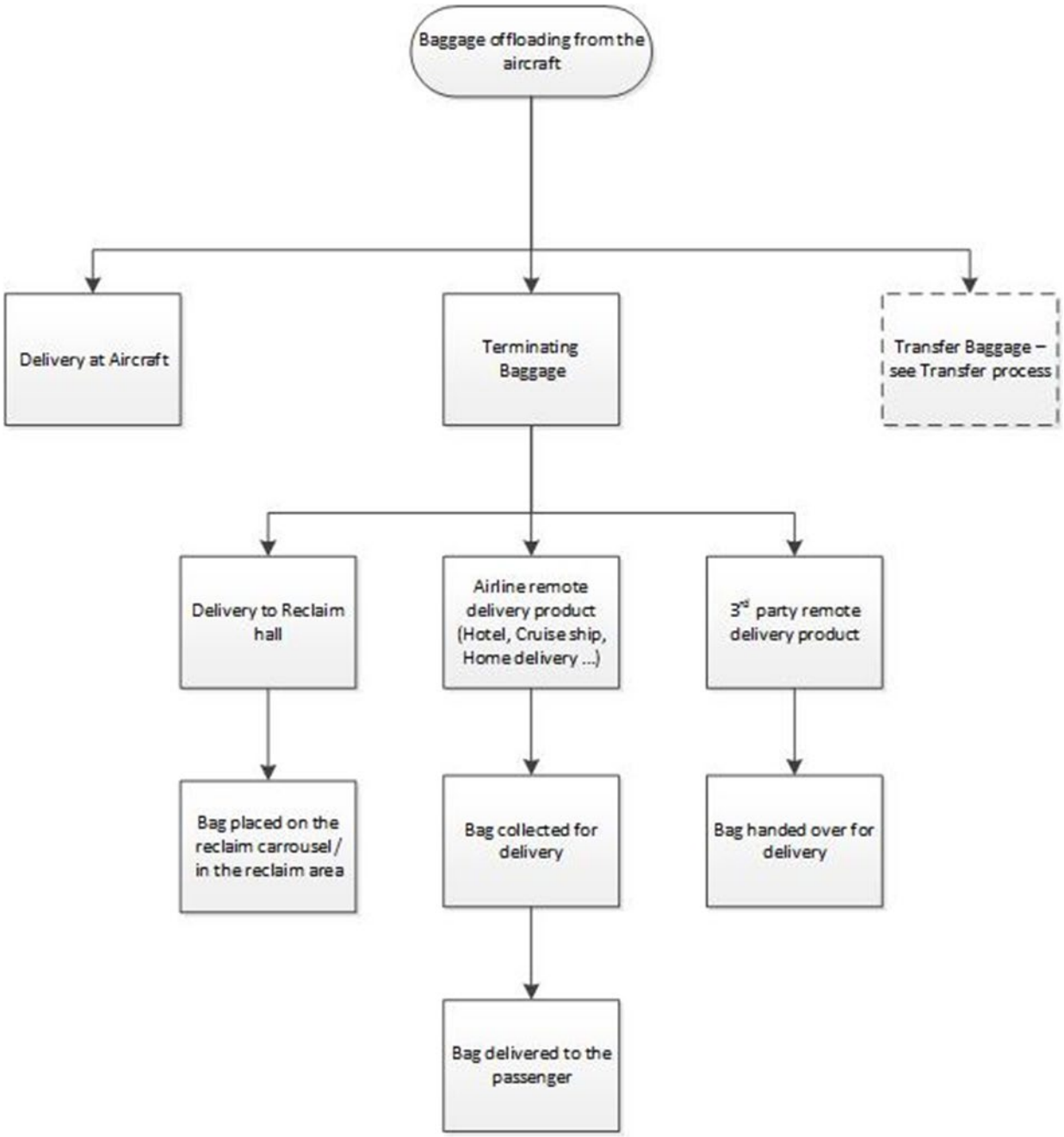
13.2. Load process



13.3. Transfer process



13.4. Arrival process



14. Appendix C – Case Studies

Appendix C contains several airline and airport case studies. The case studies offer suggestions for best practice for operations of different sizes.

14.1. Case Study – Air France

Mr. X booked a ticket from LYS to ATL via CDG.

Mr. X has one piece of baggage.

... Mr. X arrives at LYS.

1. Bag from passenger to AF

Mr. X has two choices:

- Either he has printed his bag tag at home (home printed bag tag) or via a kiosk at the airport (self-tag). So, a BSM is generated with an inactive status. Then Mr. X can go to the counter/self-drop-off machine to drop his bag. A BSM change is generated to activate the bag.
- Or he goes to the counter without having a previously printed bag tag. He drops his bag and a BSM is generated.

All these BSMs go to Air France systems and are visible in Air France bag tracking viewer/data base (= internal software that displays and stores all bag information).

2. Bag load into ULD

At the end of the baggage gallery, the bag arrives at the right pier. An agent scans a ULD and scans all bags that are loaded in this ULD via BRS device.

From this moment, all bags associated with the ULD benefit from container inheritance. From now, bags are not individually tracked but ULD are and bag positions are known thanks to ULD inheritance.

Generated BPMs are sent to AF bag tracking viewer/database.

3. ULD position in hold

The ULD containing the bag is brought to the aircraft. The ULD is scanned and localized in the hold. So, thanks to ULD inheritance, bag position is known. Then, ULDs are physically loaded in the aircraft.

Generated BPMs are sent to AF bag tracking viewer/database.

... Mr. X enters the plane and flights to CDG. So does his bag.

... Mr. X lands at CDG.

4. Aircraft unload

Agents unload ULD and bulk. They scan ULDs and bulk so that, thanks to ULD inheritance, the status of all baggage in the ULD are known.

Generated BPMs are sent to AF bag tracking viewer/database.

5. Bag exchange and BHS

ULDs arrive at the BHS. Each bag is retrieved from the ULD and dropped off at sorter belts.

The bag now enters in sorters. Sorters belong to CDG owner: Aéroport de Paris. Location points are defined in sorters (entry, localization points, exit) and BPMs are triggered at each point.

These BPMs are retrieved by the AF bag tracking viewer so that AF can follow the bag in the BHS. Information exchange occurs between the airport and AF.

6. Bag load into hold

At the end of the baggage gallery, the bag arrives at the right pier. An agent scans a ULD and scans all bags that are loaded in this ULD via BRS device.

From this moment, all bags associated with the ULD benefit from container inheritance. From now, bags are not individually tracked but ULD are and bag positions are known thanks to ULD inheritance.

Generated BPMs are sent to AF bag tracking viewer/database.

7. ULD position in hold

The ULD containing the bag is brought to the aircraft. The ULD is scanned and localized in the hold. So, thanks to ULD inheritance, bag position is known. Then, ULDs are physically loaded in the aircraft.

Generated BPMs are sent to AF bag tracking viewer/database.

... Mr. X enters the plane and flights to ATL. So does his bag.

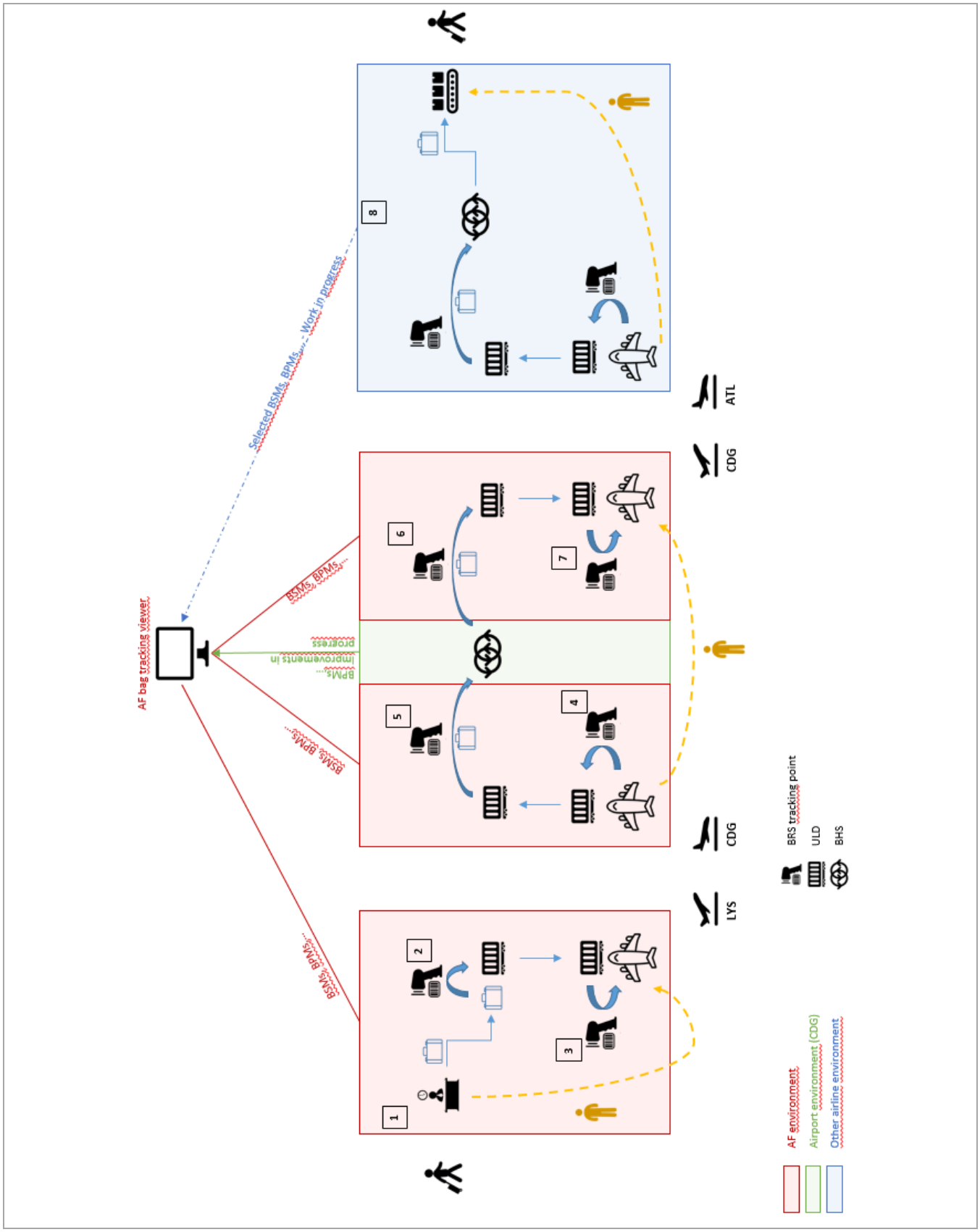
... Mr. X lands at ATL.

8. Bag exchange (AF => DL as handler)

At ATL, Air France is handled by Delta. Air France and Delta are currently working to share messages triggered at claim belts. Air France will be able to follow the bag at ATL in its bag tracking viewer.

More widely, Delta and AF work together to share BSMs and BPMs and BMMs in certain cases so that they will be compliant with Resolution 753.

...Mr X retrieves his bag and goes to his conference.


AF bag tracking viewer
Selected BSMs, BPMs... - Work in progress
BSMs, BPMs...
BPMs improvements in progress
BSMs, BPMs...
BSMs, BPMs...
ATL
CDG
CDG
LYS
BRS tracking point
ULD
BHS
AF environment
Airport environment (CDG)
Other airline environment

14.2. Case Study – Etihad and Luggage Logistics

Resolution 753 implementation example: offline scanning of bingo cards

- **What problem were we trying to solve?**

Through this exercise, we wanted to solve two elements:

- Resolution 753 requires airlines to maintain an inventory of all bags loaded in our aircraft upon flight departure. To gain benefit from this requirement, we want to have all that information available centrally.
- Moreover, we wanted to know the number of terminating and transfer bags loaded on each flight, their outbound flight, connection time and location in the aircraft before arrival in Abu Dhabi. This is part of a continuous exercise to improve our operational readiness and planning at our hub.
- To do so, in all airports we operate to with BRS implemented, loading information is sent back to our baggage systems through BPMs.
- However, some airports we operate to do not provide an access to a BRS that could send such messages back to a central repository.
- To summarize, we wanted to receive loading information for bags where airport authorities do not provide a BRS system capable of sending BPMs back to our systems yet.

- **What options?**

Several options were considered, including the following:

- Implement our own BRS solution at those airports: this solution is by far the most expensive, as it requires system and infrastructure investment. Moreover, the infrastructure to ensure connectivity might not be available at the airport (Wi-Fi / mobile network coverage etc.). This option was discarded.
- Do nothing: that option wouldn't have helped us in implementing Resolution 753, nor improving operations. Therefore, it was not considered a viable solution.
- Implement a back-office tracking tool without automated reconciliation.

- **How does it work?**

- Current reconciliation processes are kept at all airports, whether automated or manual. If the reconciliation process does not allow to send BPMs (manual or legacy BRS), we use bingo cards to record loading positions of bags.
- Bingo cards are brought back into a back-office environment where they get scanned into our tracking system by a USB bar-code scanner. Only requirement is a computer with internet connection to access the tracking database.

- Information is then added to our database of BRS-covered airports, allowing us to have loading information and positions for all bags on our flights.

Advantages and warnings related to the concept:

Advantages:

- Limited cost: no infrastructure cost, limited equipment at the airport (USB scanner). The main cost relates to the tracking system itself.
- Provides electronic information out of bingo cards – allows for further processing and analytics.
- Scanning bingo cards in the tracking database is a simple and quick task. From our experience, an average of 10 min is required for a narrow body aircraft and 20 min for a Wide Body.

Warnings:

- This setup does not provide system reconciliation, the baggage reconciliation process in use at the airport shall remain.
- While BRS information provides timestamps for processed bags (bag loaded in container, dispatched to the aircraft, loaded in the aircraft etc.), offline scanning only provides a tracking position and no time stamping.
- To be used for further usage than Resolution 753 compliance, information shall be added early enough to allow for planning and review.

14.3. Case Study – FRA/MUC/VIE/ZRH and Lufthansa Group

Model study "infrastructure meets messaging"

Based on: "Airports & Lufthansa Group for Resolution 753"-Team

The model study contains the tracking points along the journey of customer baggage considering IATA Resolution 753.

Conditions are the use/upgrade of existing infrastructure (hardware/software) e.g., a BRS-System as well as a consequent transmission of standardized IATA baggage messages (RP1745) between airlines and airports.

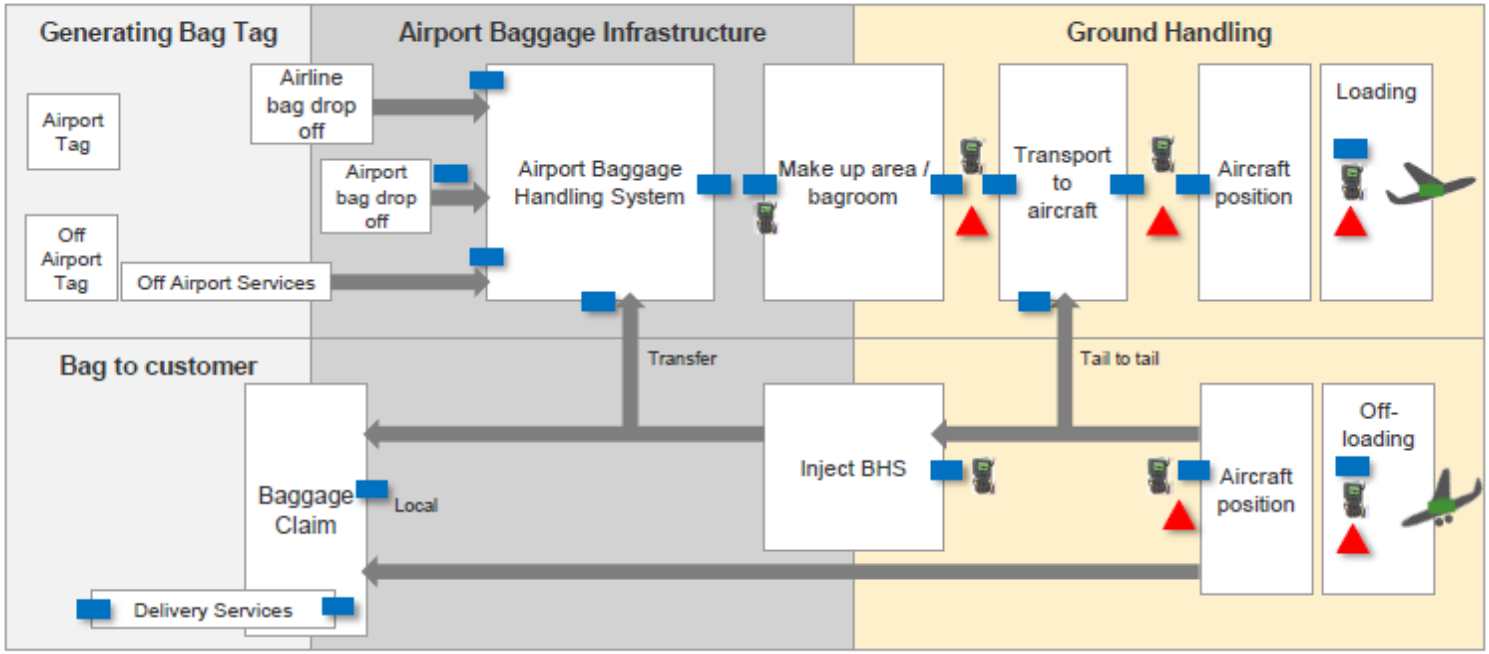
The study is based on our expert group of the airports FRA, MUC, VIE, ZRH and the Lufthansa Group.

Graphic explanation follows on the next page…

Overview

Model study „infrastructure meets messaging“

based on: „Airports & Lufthansa Group for 753“-Team



Model study "Infrastructure meets messaging" based on "Airports & Lufthansa Group for 753" - Team

= BPM

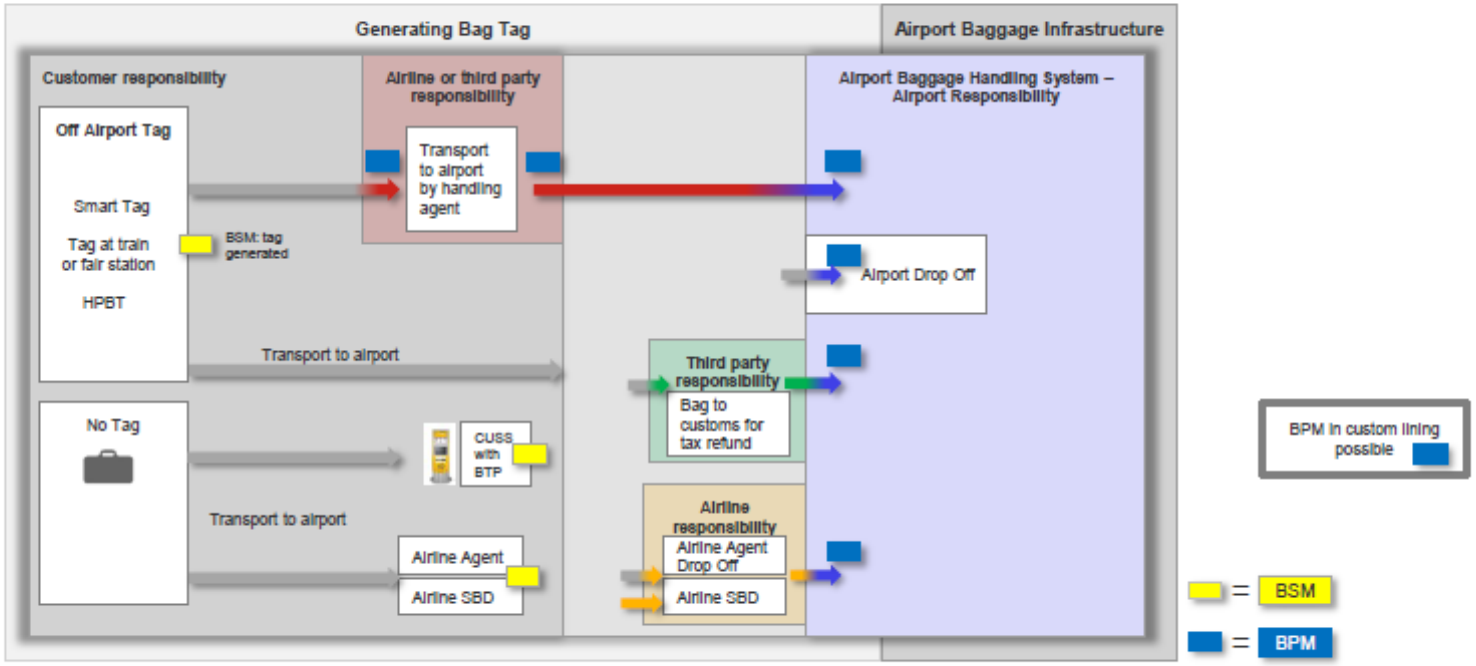
- BPM for one single bag and/or content of one ULD
- Number of tracking points /message trigger depends on ground handling contract, responsibilitys and technical properties

Lufthansa Group

Generating Bag // Drop off

Model study „infrastructure meets messaging“

based on: „Airports & Lufthansa Group for 753“-Team



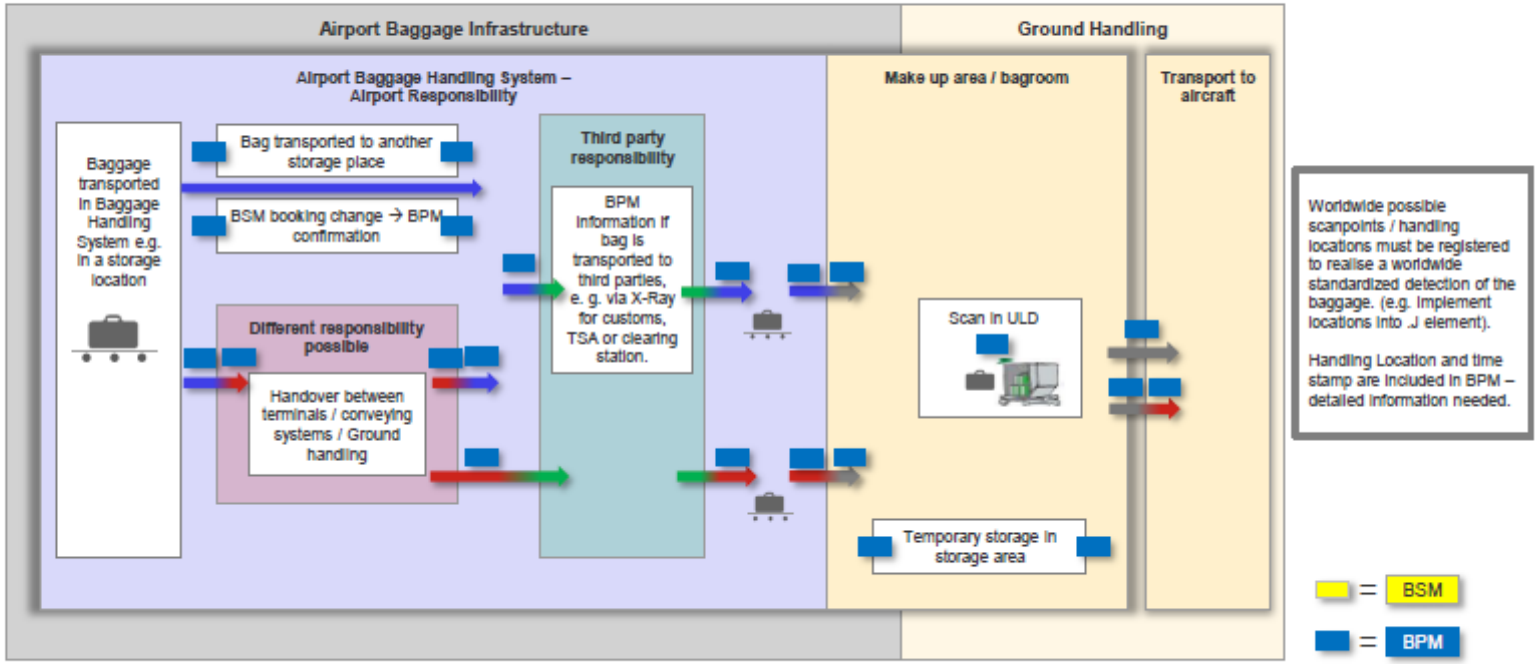
Model study "Infrastructure meets messaging"
based on "Airports & Lufthansa Group for 753" - Team

Lufthansa Group

Baggage Handling System // Bagroom

Model study „infrastructure meets messaging“

based on: „Airports & Lufthansa Group for 753“-Team



Model study "Infrastructure meets messaging"
based on "Airports & Lufthansa Group for 753" - Team

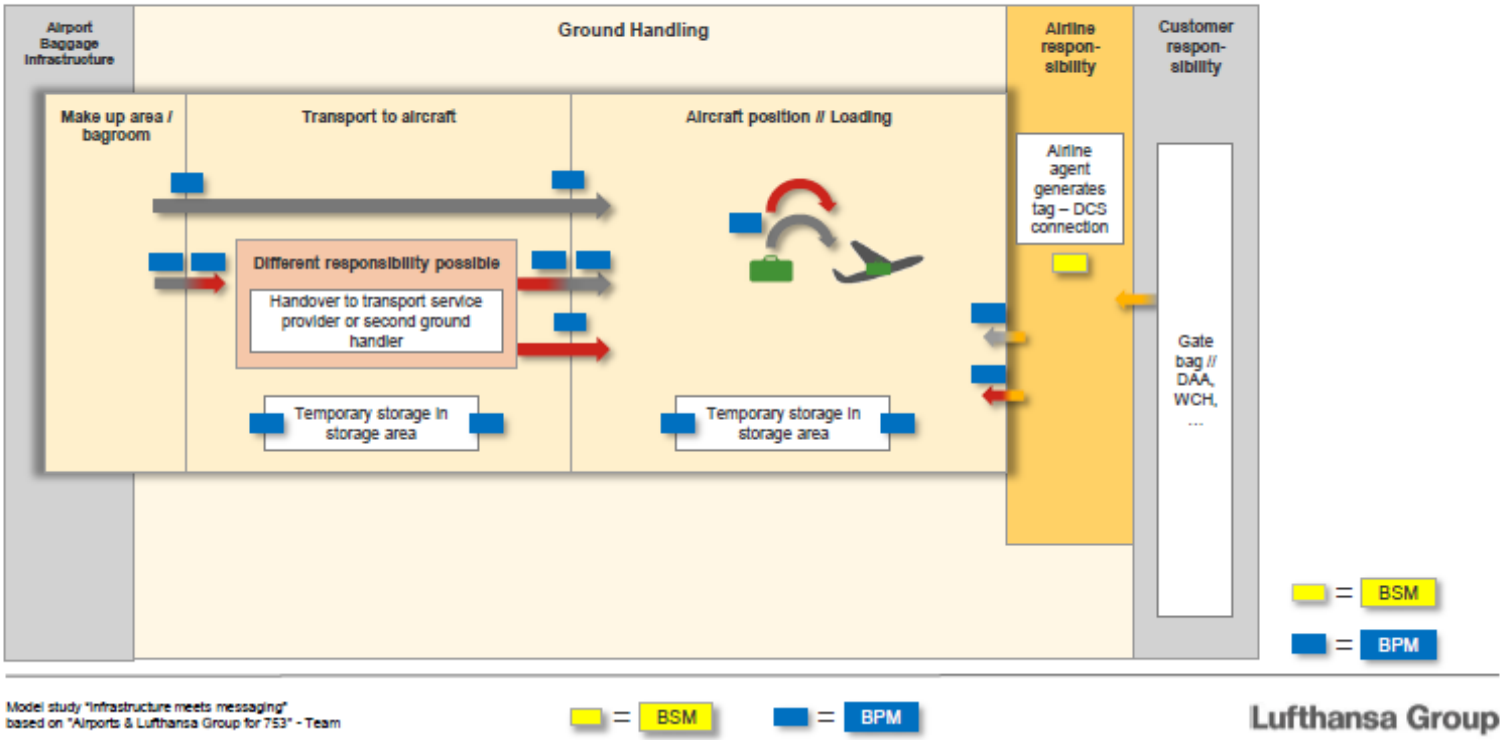
= BSM = BPM

Lufthansa Group

Outbound // Gate bags // DAA, WCH, …

Model study „infrastructure meets messaging“

based on: „Airports & Lufthansa Group for 753“-Team



Model study "Infrastructure meets messaging"
based on "Airports & Lufthansa Group for 753" - Team

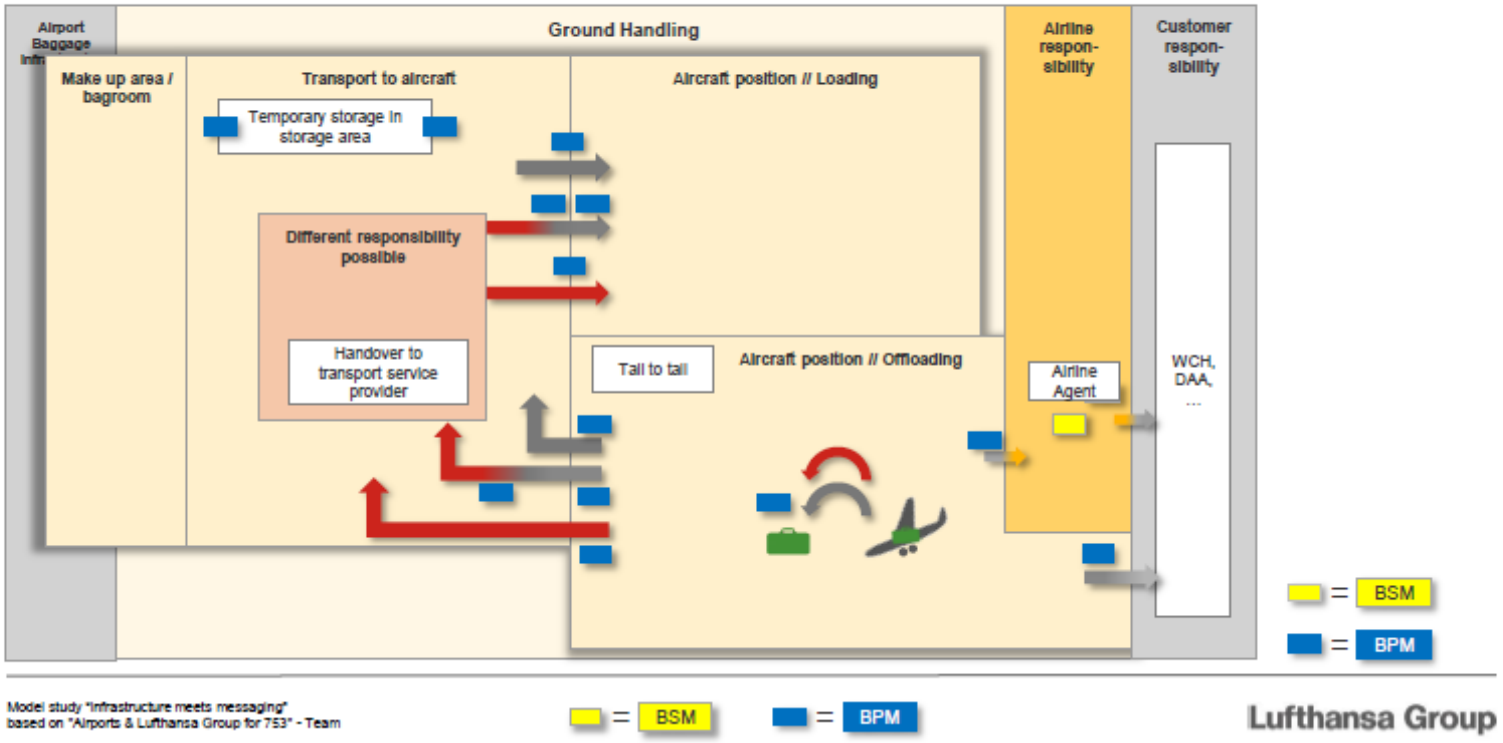
= BSM = BPM

Lufthansa Group

Tail to tail // DAA, WCH, inbound

Model study „infrastructure meets messaging“

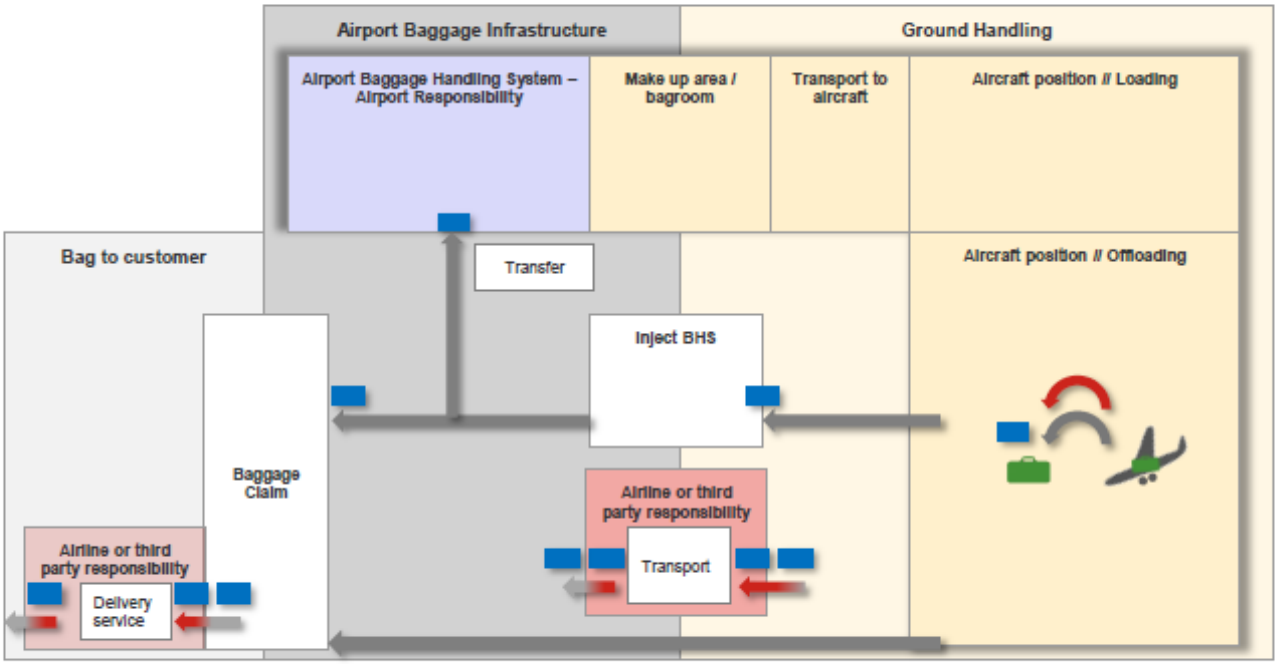
based on: „Airports & Lufthansa Group for 753“-Team



Transfer // Inbound

Model study „infrastructure meets messaging“

based on: „Airports & Lufthansa Group for 753“-Team



Model study "Infrastructure meets messaging"
based on "Airports & Lufthansa Group for 753" - Team

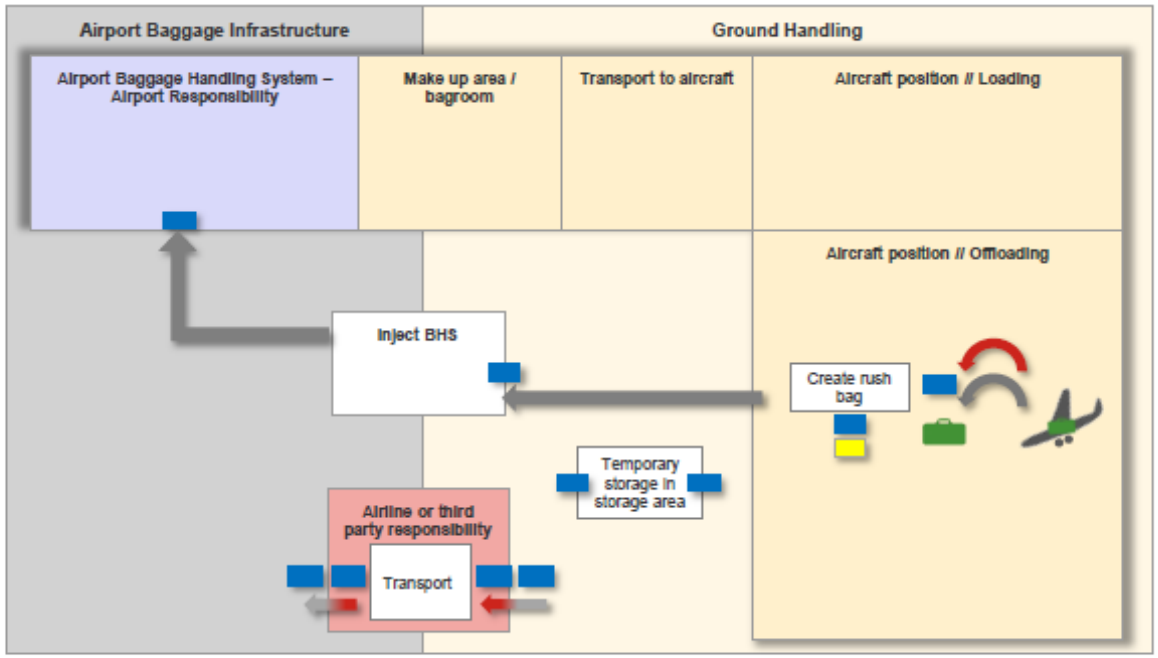
= BSM = BPM

Lufthansa Group

Rush Baggage

Model study „infrastructure meets messaging“

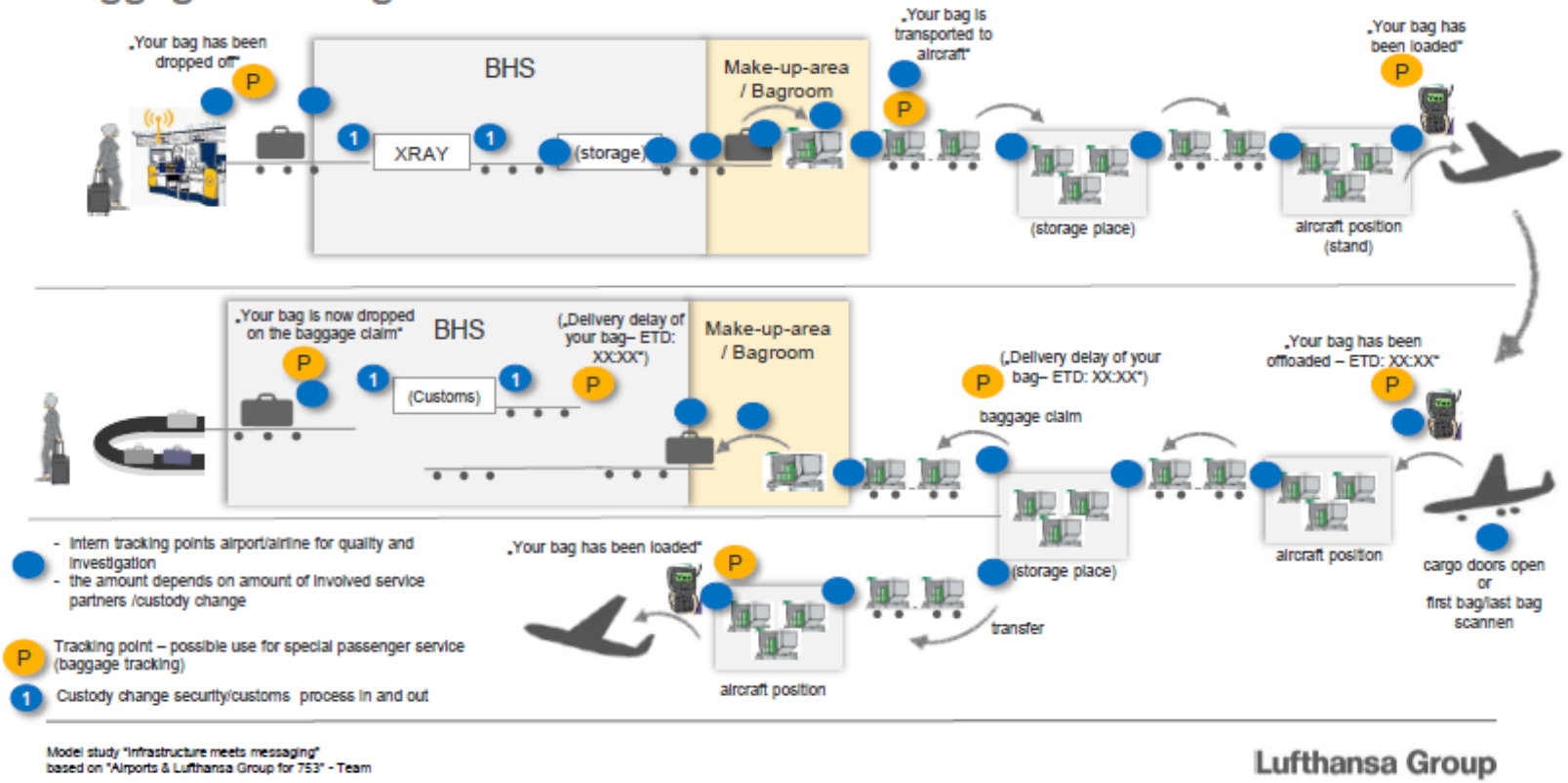
based on: „Airports & Lufthansa Group for 753“-Team



Model study "infrastructure meets messaging"
based on "Airports & Lufthansa Group for 753" - Team

= BSM = BPM

Lufthansa Group


Baggage Tracking Points
„Your bag has been dropped off"
BHS
XRAY
(storage)
Make-up-area / Bagroom
„Your bag is transported to aircraft"
(storage place)
aircraft position (stand)
„Your bag has been loaded"
„Your bag is now dropped on the baggage claim"
BHS
(Customs)
(„Delivery delay of your bag– ETD: XX:XX")
Make-up-area / Bagroom
(„Delivery delay of your bag– ETD: XX:XX")
baggage claim
„Your bag has been offloaded – ETD: XX:XX"
aircraft position
cargo doors open or first bag/last bag scannen
(storage place)
transfer
„Your bag has been loaded"
aircraft position
- Intern tracking points airport/airline for quality and investigation
- the amount depends on amount of involved service partners /custody change
Tracking point – possible use for special passenger service (baggage tracking)
Custody change security/customs process in and out
Model study "Infrastructure meets messaging"
based on "Airports & Lufthansa Group for 753" - Team
Lufthansa Group

14.4. Case Study – Interline delivery and acquisition at Los Angeles International Airport (LAX)

Note: This case study suggests a possible best practice at a large multi-terminal airport. The last paragraph goes beyond the requirements of IATA Resolution 753 to show additional benefits that could be gained from additional scanning points.

At Los Angeles International Airport (LAX), there are nine terminals. As a major transfer hub, there are many passengers on interline connections who must also change terminals. These passengers (and their bags) are the focus of this case study.

When a flight arrives, a passenger with an interline connection disembarks and starts their transfer process to the next terminal. The carrier (or their GHSP) unloads the flight and delivers the interline bag to a specified interline connection location, and potentially scans the bag with their own system. Another GHSP – the interline GHSP – picks up the interline bag. When they do, they scan the bag tag with a mobile handheld scanner and specify where they are and what they're doing (e.g., pickup at T8 interline connection point). The scanner is connected to a cloud system that also receives BSMs and flight information. The interline GHSP is provided outbound flight information, including terminal, gate, and time to departure. In addition, the system generates a BPM to indicate that the bag has been scanned, and where. The system also stores the record of the transaction for future analysis, if needed.

The interline GHSP takes the bag to the outbound terminal and drops it off at another specified interline connection location. Again, they scan the bag, specify where they are, and what they're doing (e.g., drop-off at T2 interline connection point). Another BPM is generated, and another transaction is recorded. The outbound airline (or their GHSP) comes to the interline connection location, picks up their bag (possibly scanning it with their own system), and brings it to the outbound flight to be loaded.

There are two points that this case study helps to demonstrate in terms of Resolution 753. First, regardless of the process, the agreements between the carriers defines which of the scans (e.g., pickup or drop-off) are the delivery and acquisition between the carriers. Two airlines may agree that once the interline GHSP delivers the bag (i.e. the drop off scan at T2) that single transaction is both the delivery and acquisition. Other airlines may agree that the pickup scan is the delivery and acquisition. Airlines should aim to agree single tracking points to indicate custody change.

Secondly, regardless of the agreement between carriers, additional scans are useful for the tracking of the bag through the airport. The outbound carrier knows that bags are usually dropped off within 10-15 minutes of the pickup scan. They can monitor the pickup (either in the interline system or in another system which received the BPMs) and plan to ensure the bag makes it onto the plane. If, on the other hand, the bag never arrives, the tracing of the bag's journey through the airport has more touch points. This helps narrow down where the bag was lost, and therefore recover it.

15. Appendix D – Treatment of irregularities in operations

Generally, the treatment of baggage irregularities, and processes that deviate from normal operations under Resolution 753, should be looked at in precisely the same way as normal hold baggage.

- If the bag is taken from the passenger, the event should be recorded.
- If custody of the bag changes from one carrier to another or is delivered to a transfer point agreed by both carriers, then it should be recorded.
- If the bag is loaded on departure, it should be recorded.
- If the bag is delivered to a passenger, then the event should be recorded.

How the member carriers process the bags before and after these particular touch points is for the carrier to decide as specific baggage handling processes for irregular baggage operations is outside the scope of this document.

This Appendix is intended to give some direction in the handling of some baggage irregularities, but only insofar as how their processing might be affected by Resolution 753 obligations.

15.1. Mishandled baggage

When a bag is mishandled, in most cases (from a baggage handling perspective) the bag is simply re-flighted and then eventually inserted into the normal departure bag handling process for loading onto the new flight. For Resolution 753 (leaving aside any obligation under various baggage mishandling best practices or resolutions):

If the new flight is operated by the original carrier, then:

- No new acceptance tracking is needed. The original acceptance from the passenger still applies.
- No baggage exchange tracking is needed as it's the same carrier holding custody.
- The loading of the re-flighted bag on the new flight should be recorded.
- A record of the delivery of the bag to the passenger at their home or hotel (as opposed to an arrival belt) will be required.

If the new flight is operated by a different carrier, then:

- No new acceptance tracking is needed. the original acceptance from the passenger still applies.
- A record of a physical bag exchange or delivery to an agreed transfer point should be recorded.
- The loading of the re-flighted bag on the new flight should be recorded by the new carrier.
- A record of the delivery of the bag to the passenger at their home or hotel (as opposed to an arrival belt) will be required.

In the rare occurrence where a mishandled bag is encountered at an airport where none of the interline partners operate it is suggested that:

- The carrier that agrees to transport the bag will need to record an acceptance of the bag (or a custody change) to confirm that they now have and will process the physical bag. An "On Hand" message might suffice but only if the carrier recording this message was going to perform the bag transport.
- That transporting carrier will need to record the loading of the bag on the departing aircraft.
- The custody exchange of the bag by the next carrier or the delivery of the bag to the passenger will need to be recorded.

In all of the above, the principles of Resolution 753 are consistently maintained, with required touchpoints being recorded.

15.2. Departure gate bags

If a bag is taken from a passenger at the gate as opposed to delivery into the standard baggage handling process from check-in, then this event should be specifically recorded to comply with Resolution 753 (acceptance from passenger). This would apply to bags checked in and then taken to the gate, as well as bags checked in at the gate.

After this acceptance, any loading, custody exchange and standard delivery at the final destination should be handled in the same way as all other hold baggage from a Resolution 753 tracking viewpoint.

15.3. Arrival gate bags

If a checked in bag is delivered to a passenger at an arrival gate as opposed to being delivered to an arrival carousel, then this return to the passenger should have a distinct process for recording the delivery of the bag.

15.4. Tag-less bags

The specific handling of tag-less bags has no special treatment under Resolution 753. If the entity resolving the re-tagging was the carrier who is currently holding custody of the bag, then the bag simply enters the normal handling process when re-tagged and the Resolution 753 tracking points will apply again, from that point onwards.

If the entity re-tagging the bag is one of the interline carriers for the bag, but no formal custody change or transfer has occurred, then they should record the bag as now being in their possession (thus confirming the custody change) and then process the bag as normal.

In the rare occurrence where the entity re-tagging the bag is not involved in the formal transport of the bag, it is suggested that the carrier will need to record an acceptance of the bag (or a custody change) to confirm that they now have and will process the physical bag.

16. Appendix E – Baggage tracking action sheet

The key documents related to baggage tracking are:

- IATA Resolution 753
- IATA Resolution 753 Implementation Guide
- IATA Resolution 753 Implementation plan template

Please visit www.iata.org/baggage or contact IATA (baggageservices@iata.org) to obtain a copy of these documents.

The below considerations and questions are indicative and do not represent an exhaustive list to help key stakeholders in the aviation industry prepare for IATA Resolution 753.

The considerations and questions are following the requirements contained in IATA Resolution 753 which are processed based and not technology based.

Each airline and airport location has its own unique infrastructure, and these should be considered when putting together an implementation plan.

CONSIDERATIONS FOR AIRLINES

- **Define your overall tracking strategy**

  ☐ What is the reasoning behind the strategy considered?

  Possible tracking strategies are:

  - Airlines rely on airports to drive implementation.
  - Airlines focus on their hubs.
  - Airlines focus on their hubs and network.
  - Airlines focus first on locations with mishandling issues based on baggage tracing system data.

- **Baggage Tracking implementation at your hub**

  ☐ Are there any plans for Resolution 753 implementation coming from your baggage services department in your Hub?

  ☐ What is the timeline for implementation?

  ☐ How is your hub airport implementing Resolution 753 and what are the timelines?

  - What is the appropriate forum to discuss baggage tracking at your hub with all the key stakeholders (e.g. AOC)?

- **Four mandatory tracking points**

Check-in

☐ What are the possible touchpoints where the custody change could be recorded?

☐ What are the different types of tags issued (e.g. self-service generated tags, normal on demand baggage tags, etc.)

☐ What is the process for capturing the tracking information for all the above-mentioned bag tags?

☐ What is the recording method used?

Load

☐ Where do you scan the bags put in sealed containers (e.g. build)? For information, bags that were scanned at build and placed in a sealed ULD do not need to be re-scanned under the aircraft.

☐ How do you record the position of ULDs at the time of the loading?

☐ How and where do you scan loose loaded bags and how do you transport the loose loaded bags (e.g. baggage trolleys/carts with no netting/cover)? For information, the loose loaded bags need to be scanned onto the aircraft rather than at build.

☐ What process do you use to reconcile the number of bags you are supposed to load from the check-in information versus the number of bags you have at the aircraft?

Transfer

☐ What is the process to scan the transfer bags?

☐ Where would it make sense to have the change in custody for the transfer bags (e.g. bag exchange, aircraft unloaded, connecting drop location, BHS)?

☐ How are the bags scanned for tail-to-tail operations?

Arrivals

☐ What is the process to scan the bags for carousel delivery?

☐ How are the bags scanned for passengers receiving their bags at the aircraft stand? This may be the case for strollers and other mobility aids.

☐ How is the delivery of bags being recorded for passengers receiving their bags at non-airport locations such as their homes?

- **Baggage tracking implementation outside the hub (at stations your airline flies to)**

  It is recommended to make a list of your stations and assess the readiness for Resolution 753 at every station.

  Contact station managers to find out:

  ☐ Are they familiar with Resolution 753 and the various implementation strategies contained in the implementation guide?

  ☐ What is the situation regarding baggage tracking at each station? Has baggage tracking been in place (is the option/solution "available"? Has your airline been "in" (switched on…)?

  ☐ Do you have any existing agreements between your airline, GHSPs and airport related to baggage tracking?

  ☐ Has Resolution 753 been discussed through the AOC? Do they have some common approach?

  ☐ Is there perhaps a common approach to take with some solution alliance partners?

  ☐ Which solution might be the optimal one for the implementation of Resolution 753 at each station?

- **Baggage messaging sharing**

  ☐ Do you have a plan for sending and receiving baggage messages with other interline carriers involved in the journey?

  (Please note that sending a PDF in an e-mail would not be advised at all for automated airports where RP1745 formatted messages would be better – e.g. BPMs and BMMs).

  ☐ Do you know if your airline alliance is planning on having a common approach?

  ☐ Do you know how you will agree with each interline carrier how to exchange data (e.g. on-demand vs operational, the information reported – scheduled batch delivery vs on request, data format, frequency and technology used)?

  ☐ Do you know how you will store the baggage tracking data?

  ☐ Have you contacted your hub airport to help getting some baggage messages?

CONSIDERATIONS FOR GHSPs

It is recommended for GHSPs to work with airlines regarding baggage tracking and Resolution 753.

- In your view, what role should the GHSP play in the implementation of Resolution 753?
- Have you identified how you could support the airlines in the implementation of Resolution 753?
- Have the airlines you serve contacted you regarding the implementation of Resolution 753?
- Do you have an agreement with the airlines related to baggage tracking?

CONSIDERATIONS FOR AIRPORTS

- **Baggage tracking implementation at an airport**
    - Have you received requests from airlines to implement Resolution 753?
    - Are you engaging with airlines individually or through the AOC or LBC for Resolution 753 implementation?
    - Does your airport/terminal(s) have a BHS?
    - Does your airport/terminal(s) have a BRS?
    - What airport infrastructure do you have already to support airlines scanning bags at the four mandatory tracking points (acceptance, load, transfer and arrival)?

	Baggage tracking data collection & archiving						
	Bingo Cards	**PC/ Laptop**	**Connected Scanner**	**LAN**	**Standalone HHTs**	**WLAN**	**3G/4G**
Check-in area **Acceptance*							
Office rooms							
Bag Hall **Load*							
Make up Area **Load*							
Aircraft **Load*							
Offloading Stations **Transfer*							
Offloading Stations **Arrival*							

Standalone HHT = With WLAN or without Network connection.

** Core / mandatory tracking points*

- **Baggage message**
  - Do you already have the baggage tracking data needed? For example:
    - Acquisition of the bag
    - Tracking data from sorting process
    - Injection of transfer bags
    - BRS loading operations
    - Common use arrival tracking facilities
  - Is your airport capable of exchanging baggage messages with airlines?
  - How could an airline receive messages from your airport (e.g. Message Distribution System, Enterprise Service Bus, Message Queues)?
  - What process does your airport use to exchange baggage information?

	Data Transmission				
	Email	**BRS report**	**Baggage Processed Message (BPM)**	**No message available**	**Other**
Check-in area **Acceptance*					
Office rooms					
Bag Hall **Load*					
Make up Area **Load*					
Aircraft **Load*					
Offloading Stations **Transfer*					
Offloading Stations **Arrival*					

** Core / mandatory tracking points*

- **Common use and BMS considerations**
    - Does your airport have a common use infrastructure for baggage processes?
    - Do you use generic scanners to record data into a BMS?
    - Does it trigger events to send BPMs to carriers own systems?
    - Are you ensuring that as many elements as possible are captured (e.g. weight)?

- **Implementation plan for Resolution 753**
    - Do you have plans to support airlines implementing Resolution 753 at your airport?
    - Do you have a timeline for implementation?

For more information, please check the ACI World website at: https://aci.aero/

17. Appendix F – Resolution 753 and airport charges

As per International Civil Aviation Organization's (ICAO's) guidance (para 6.16 of doc 9562 refers), investment in an enhanced baggage handling system (baggage infrastructure) may reduce the number of agents required in the future thereby reducing future operating costs. Transportation efficiency benefits may also accrue to the air carriers and would include savings arising from the quicker turnaround of aircraft, and possibly greater service reliability and predictability.

As a result, any improvement in a baggage handling systems would result in lower costs for the users and cannot justify an increase in the level of charges. Conversely, long-term reduction in the cost-base of charges should ensue.

In any case, and in line with ICAO's policies on charges in Doc 9082, any cost pertaining to a baggage handling system and passed onto users through charges must be non-discriminatory, subject to meaningful consultation with the airlines and their representative organizations (respectively in between all parties concerned), related to the efficient cost of providing the facilities and services, and transparently justified.

For any specific airport charges related query in relation to the implementation of Resolution 753 at your particular airport please contact IATA Airport Charges team: aviationcharges@iata.org

List of IATA Strategic Partners

The list of IATA Strategic Partners (SP) can be found at:

https://www.iata.org/en/about/sp/partners-directory/

- Filter the SP directory for "all baggage services".

List of Resources

Resource	Where to find it
IATA Resolution 753	PSCRM Baggage Tracking Implementation Guide
Baggage Tracking Implementation Guide (issue 3, November 2017)	www.iata.org/baggage
Baggage Tracking Presentation	Contact baggageservices@iata.org
Regional workshops delivered by IATA	Contact baggageservices@iata.org
IATA Certificates (Hub, Network)	Contact baggageservices@iata.org
Implementation Plan Review	Contact baggageservices@iata.org
Resolution 753 tracker tool	Contact baggageservices@iata.org
Consultancy services	Contact baggageservices@iata.org
Baggage Tracking – Implementation and Compliance Training Course	IATA Training