Baggage Tracking

IATA Resolution 753/A4A Resolution 30.53

Implementation guide

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1 Introduction

Baggage is one of the key customer satisfaction elements for airlines. A failure to deliver the passengers' baggage will result in the memories of the nice inflight product and good service in the air being forgotten very quickly. The costs associated with repatriating the bag with the passenger, estimated by IATA at $100 per bag, will also quickly eat into the margins for the journey, and at the same time the additional work needed by your staff to deal with the customer, the bag and the other airlines / airports involved will use up the time of valuable resources. Despite the fact that mishandling has reduced by more than half since the 2007 peak, we still spent $2.3 billion in 2015 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 bags.

It is clear, then, that our industry must continue to strive towards lower mishandling and better service. One of the key elements, shocking in its absence from the industry today, 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 goods inwards, the processes to be applied and no idea when the finished product is delivered to the customer. No real world factory could exist with such a lack of information, yet the aviation industry is in exactly this situation for baggage. It is a credit to all the people working in baggage that the mishandling rates are so low, and that they continue to drop.

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

It is with great pleasure, then, that IATA presents this guide to implementing baggage tracking according to Resolution 753. Whilst the principle of 753 is very simple – track bags through the baggage factories, 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. 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 bag, and what the responsibilities of each party are. The guide has been produced by the IATA Baggage Tracking sub-Group, whose members from airlines, airports, ground handlers and IATA Strategic Partners bring a wealth of practical information on how to be successful at tracking.

IATA remains at the forefront of the battle against mishandled bags, and can be contacted with any questions you have through baggageservices@iata.org. A better alternative, though, would be to play an active role in the Joint IATA/A4A Baggage Working Group, where the initial resolution for tracking originated and where many exciting future developments for our industry are first discussed. Please visit www.iata.org to learn how to participate.

Andrew Price
Head, Global Baggage Operations, August 2016

2 Executive summary

IATA Resolution 753/A4A Resolution 30.53, 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 A4A understand that the implementation of baggage tracking can be a complex process. Reduction in mishandling is a common goal for everyone in the aviation industry; 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 ground handlers – the resolution places an obligation on IATA and A4A member airlines: nevertheless in many cases, those airlines will be looking to the airports from which they operate, and the ground handlers who load their bags, to provide the data that they need.

This document is therefore aimed at airlines, airports, or any other party with an interest in helping airlines to meet their obligations under Resolution 753/30.53. 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:

- One - what is meant by 'Baggage Tracking'; what data needs to be recorded, the timeliness of that record and the potential methods to be used.
- Two - how the data can be exchanged with other parties; including a Data Charter outlining the sharing of information, as well as a discussion on who might record data, when that data might be exchanged and the technologies that could be used for this exchange.
- Three - a discussion of how tracking and data exchange can be used to achieve the benefits outlined in the resolution
- Four - a look at how a member carriers airport, interline and ground handling partners can work together to implement a cost effective compliance to the resolution
- Five - a discussion on Best Practice, and how tracking strategies could be evaluated.

The document also includes supporting information, such as a number of Case Studies; these provide real-world examples on how airlines and airports meet the requirements of the resolution in order to provide compliance for member airlines.

It is important to remember that this document is intended to provide guidance on how an airline might meet their obligation, and how an airport might support their airlines in doing so. It is a guide; it is not a set of instructions. Many of the recommendations in this document might not be appropriate for every airline; on the same note, the approach to recording tracking data may differ across an airline's network. Airlines can – and should – analyse their baggage operation before embarking on a program to implement any of the recommendations in this guide. That said, airlines must, as a minimum, be capable of recording and sharing tracking data as required by the resolution.

This implementation guide has been written by members of the Joint IATA/A4A Baggage Working Group. It is a living document which will be periodically updated.

3 Resolution 753

3.1 Current resolution

Agreed version of IATA Resolution 753 effective 1 June 2018 as per 37th PSC Manual (published June 2017)*:

RESOLVED that:

IATA members shall maintain an accurate inventory of baggage by monitoring the acquisition and delivery of baggage. "Baggage"/"Bag" means the property, as defined in applicable tariffs, of a passenger, carried in connection with the trip for which passenger has purchased a ticket and which has been checked in.

1. Purpose

Accurate baggage inventories will:

- prevent and reduce mishandling by determining custody of every bag during different phases of baggage chain,
- increase passenger satisfaction, as mishandling is reduced,
- reduce the possibility of baggage fraud by closing the baggage journey,
- enable exceptions to be detected where baggage is delivered to a party, but not processed further,
- speed up reconciliation and flight readiness for departing flights,
- help measuring compliance to SLAs,
- Provide evidence to an automatic interline proration process

2. Member Obligations

Members shall be able to:

- **(1) Demonstrate delivery** of baggage when custody changes;
- **(2) Demonstrate acquisition** of baggage when custody changes;
- **(3) Provide an inventory of bags** upon departure of a flight.
- **Be capable of exchanging the above information (1..3)** with other members or their agents as needed.

3. Tracking requirements

The minimum set of recorded tracking points shall be:

- 3.1 Acquisition of the bag from the passenger by the member or its agent
- 3.2 Delivery of the bag on to the aircraft
- 3.3 Delivery and acquisition of the bag between members or their agents when custody changes between carriers
- 3.4 Delivery of the bag to the passenger.

References

IATA Resolutions Manual: RP1800 and RP1745

**Note: This text duplicates the text contained within A4A Resolution 30.53, as published in the A4A Trade Practices Manual.*

3.2 Compliance with Resolution 753/30.53

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 1 year. This certificate does not exempt the airline from any obligations under Resolution 753/30.53.

4 Disclaimer

The baggage journey is in general a complex process which is always at the mercy of external influences. Airports are complex environments and can be 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 2014, IATA published the "Baggage Disruption Handling manual," available for free on the IATA website. The document is intended to help minimize the effect of disruptions to the baggage process. Following the guidelines contained in this document will help airport operators, airlines and ground handlers to:

- 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 753/30.53 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 753/30.53. Some of the recommendations in this document may not be appropriate for your airport or operation; some will need to be adapted in order to be applicable.

The document was created by the Baggage Tracking Sub-Group, which was formed by the Joint IATA/A4A Baggage Working Group. It comprises a number of experts from airlines, airports and airport suppliers who have combined their knowledge and expertise in order to create a set of baggage tracking recommendations.

The information contained in this publication is subject to constant review. The Baggage tracking Sub-Group would welcome feedback on the document; either on ways in which it can be improved, or, more importantly, on how you have used the information contained within to implement your baggage tracking project. This document is intended to be a living document which will be periodically updated. Please provide your feedback to baggageservices@iata.org.

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5 Glossary of Terms

ACQUISITION - the acceptance of baggage by a member or its agent

ACCEPTANCE - the initial transference of possession, control and/or security of checked baggage from a passenger to a member or its agent for carriage.

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. See Section 7 for a further discussion on Data Exchange.

BAGGAGE CART or TROLLEY - temporary load device used to transport bags 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 arrivals 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 and Baggage Manifest Message (BMM), and Baggage Request (BRQ) as described in PSC RM RP1745.

BULK HOLD – The area in an aircraft where bags are loose loaded (loaded individually), rather than in a Unit Load Device.

CHANGE IN CUSTODY - the transference 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 or its agent

DATA EXCHANGE - the exchange of data between a user and a system; two users; two systems; or a number of 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 for later reference the acceptance, acquisition, or change in custody of checked baggage.

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.

SERVICE LEVEL AGREEMENT (SLA) - a document in which the service levels to be provided by a third party ground handler and the service levels expected by the member are mutually agreed.

TAIL-TO-TAIL or FIN-TO-FIN - the transfer of baggage, freight and mail from aircraft to aircraft without an intermediate point.

TRACKING POINT - any place or position in which a baggage record is created to identify time and location.

BAGGAGE TRANSFER - Baggage arriving at a point on one flight and continuing its journey on another flight within a defined time limit.

UNIT LOAD DEVICE (ULD) - a pallet or container used to load baggage, freight and mail on wide-body aircraft and specific narrow-body aircraft.

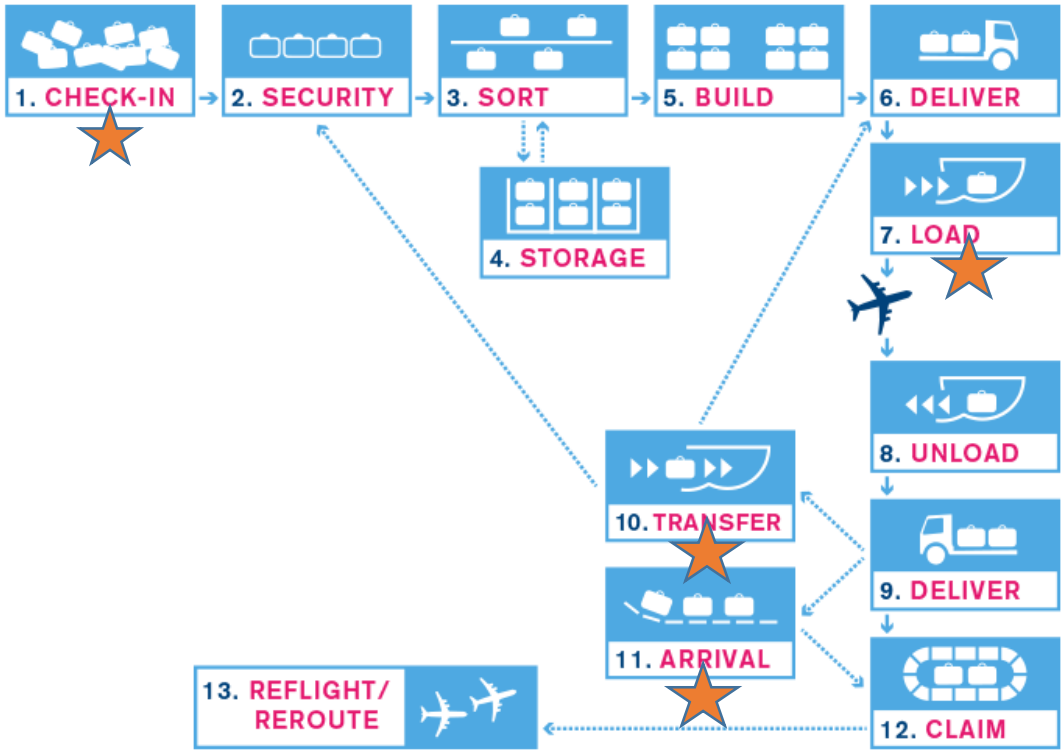
EXTENSIBLE MARKUP LANGUAGE (XML) - a markup language that defines a set of rules for encoding documents in a format that is both human readable and machine readable, as defined by the W3C's XML specification and other related specifications, all of which are free open standards.

6 Bag Tracking Options

6.1 Core tracking points

The minimum of set of recorded tracking points shall be:

- 3.1 Acquisition of the bag from the passenger by the member or its agent
- 3.2 Delivery of the bag on to the aircraft
- 3.3 Delivery and acquisition of the bag between members or their agents when custody changes between carriers
- 3.4 Delivery of the bag to the passenger.



= Mandatory tracking point

To obtain the mandatory tracking points (for Resolution 753/30.53 compliance, this section describes the definition of a tracking point, what is recorded and at which locations these tracking point can be recorded. There are examples of recording methods and a review of the technologies, which can be used to provide the tracking points as well as considerations for using each of the listed technologies.

6.2 Definition of a tracking point

In baggage tracking terms, recording tracking points 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.

It is recommended that this data is retained for 3 years for baggage claims and pro-rate purposes.

6.3 What is recorded at a tracking point

6.3.1 Mandatory data elements

The ten digit bag tag number is mandatory in all cases when recording tracking points.

6.3.2 Recommended data elements

The following items should also be recorded where available.

- Passenger Name
- 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 (ULD, Trolley or Cart)

If the recommended data elements are available by association, it does not need to be repeated e.g. 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 Acquisition of Bag (From the passenger to the carrier)

Possible tracking points	Recommended data elements	Example of recording method
Counter	LPN, Outbound Flight, Station, Time	Manual or handheld scanner (barcode, RFID)
Baggage Drop	LPN, Outbound Flight, Station, Time	Self-service bag drop reader (Barcode, OCR, RFID)
Offsite	LPN, Outbound Flight, Station, Time	Manual or handheld scanner (barcode, RFID)
Security Screening	LPN, Outbound Flight, Station, Time	Handheld scanner or fixed pier and claim read point (barcode, OCR, RFID)

BHS	LPN, Outbound Flight, Station, Time	Fixed pier and claim read point or sortation reader (barcode, OCR, RFID)
Gate	LPN, Outbound Flight, Station, Time	Manual and handheld scanner (barcode, RFID)
BRS	LPN, Outbound Flight, Station, Time	All of the above

Note that the touchpoint should be recorded as early as possible after the physical handover from the passenger

6.4.2 Recording Delivery of Bag on to the Aircraft

Possible tracking points	Recommended elements	Example of recording method
Bag Load into hold	LPN, Outbound Flight, Station, Tracking Action	Handheld scanner or fixed belt loader reader (Barcode, RFID)
ULD position in hold	LPN, Outbound Flight, Station, Tracking Action, Container ID	Handheld scanner or fixed reader (barcode, RFID)
Trolley/cart load into hold	LPN, Outbound Flight, Station, Tracking Action, Container ID	Handheld scanner (Barcode or RFID)

Tail to tail containers fall into the "ULD Position In Hold" tracking point, but the inventory of bags in the container will need to be obtained from the originating carrier.

6.4.3 Delivery and Acquisition of Bag between Carriers at Defined Connecting Point

Change of custody from the delivering carrier to the receiving carrier must be agreed between the relevant parties. Ideally, a single agreed tracking point should act as both the demonstration of delivery and demonstration of receipt. The agreed tracking point may vary depending on time or other operational factors.

Recording of additional custody changes between agents acting on behalf of the same carrier is also recommended.

Possible tracking points	Recommended elements	Example of recording method
Bag exchange (carrier to carrier)	LPN, Inbound Flight, Outbound Flight, Station, Time, Recording Location	Depended on the chosen bag exchange tracking point
Bag exchange (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)

Connecting Drop Location	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 Delivery of the Bag to the Passenger

Possible tracking points	Recommended elements	
Carousel Delivery	LPN, Inbound Flight, Station, Time	Fixed pier and claim reader (barcode, OCR, RFID)
Direct delivery to passenger	LPN, Inbound Flight, Station, Time, Recording Location, Tracking Action	Handheld scanner or manual (barcode, RFID)

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 laser/Imager scanners or handheld laser/Imager scanners. Optical scanners typically enables the transmission of data in real-time. IATA Resolution 740 defines the requirement for interline baggage tags supporting optical scanning.

- **Considerations:** All baggage is today 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, so the readability decreases during the bag journey. The cost of fixed scanners is relatively high, and labor costs should also be taken into account.

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 baggage tag have been destroyed 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 labor and time-intensive and has a higher risk of mis-recording than automated technologies. If the bag 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 (Radio Frequency IDentification) 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 hand held RFID readers, and data is typically send in real-time. IATA Resolution 740 defines the requirement for interline baggage tags support RFID scanning and IATA RP 1740c defines the requirement for using RFID for baggage identification.

- **Considerations:** RFID can be a cost-effective way to track baggage; however, the cost of both infrastructure and tags should be taken into account - 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 "RFID For Baggage Tracking Business case 2016", at https://www.sita.aero/resources/type/white-papers/rfid-for-baggage-tracking

6.5.4 Optical Character Recognition (OCR)

Optical Character Recognition is utilizing 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. Optical Character Recognition requires barcodes on baggage tags and OCR scanner to scan the baggage tag. OCR scanners are typically fixed mounted and sends data in real-time. IATA Resolution 740 defines the requirement for interline baggage tags supporting OCR scanning.

- **Considerations:** The number of suppliers of OCR technology has increased in the last few years, which has a beneficial effect on cost. 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), NFC, Wi-Fi, GPS or other

Less prevalent in the industry are tracking technologies based on Bluetooth, NFC, Wi-Fi, GPS or other. These technologies could 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.

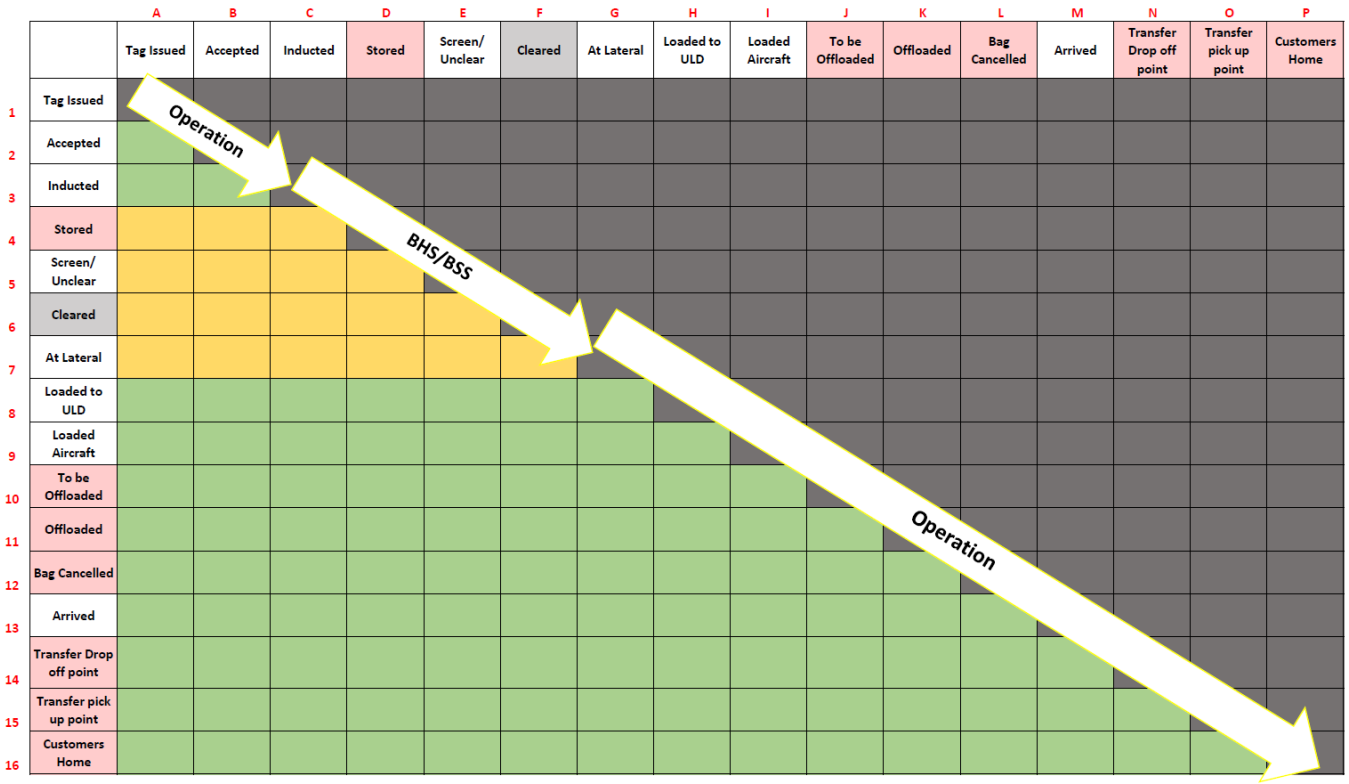
- **Consideration:** While these techniques may be suitable for in-house tracking, the lack of standardization across baggage systems for these technologies may limit their usefulness. Usage of any active transmission technologies must demonstrate compliance to FAA Advisory Circular 91-21-C.

6.6 End to End Baggage Tracking

As well as recording the individual 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 bag 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)



7 Use of Tracking Information

7.1 Data Charter

The baggage data that is collected during the implementation of Resolution 753/30.53, particularly when it comes to data being shared, is an area that raises natural concerns among Member Carriers. The opportunity for misuse or mishandling of sensitive data is clearly present. The Resolution 753/30.53 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 (draft)

In the context of IATA Resolution 753/A4A Resolution 30.53

- 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 IATA/A4A Member Carrier 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.
  - Any non-Member Carrier that is expected to transport or handle the bag during any part of a bag's journey.

- ***Baggage Service Providers*** 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/A4A Member Carriers and Primary Stakeholders within this charter also apply to Baggage Service Providers acting on their behalf,

- IATA/A4A Member Carriers may receive baggage handling data from Primary Stakeholders other than IATA/A4A Member Carriers (e.g. Airports, non-IATA/A4A members). The terms of this charter also apply to data received by IATA/A4A Member carriers from such organisations.

- When baggage handling data is captured by an IATA/A4A Member Carrier, they are obliged to provide this data to other IATA/A4A Member Carriers that are expected to transport or handle the bag during any part its journey.

- Baggage handling data exchanged between two IATA/A4A Members Carriers should be provided in a manner and format that is agreeable to both parties.

- For interline bags, as a minimum, an IATA/A4A Member Carrier should be capable of sharing data with other interline IATA/A4A Member Carrier(s). 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/A4A Member Carrier 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 Carrier, 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 and privacy.

- When an IATA/A4A Member Carrier is providing baggage handling data to another IATA/A4A Member carrier, 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/A4A Member Carrier, 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/A4A Member Carrier receiving the data.

7.2 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.

7.2.1 On-Demand / Operational:

- **As each bag is processed:** this is where a means of data exchange is used that allows the recording party (airline or airport) to deliver or make available to the other suitable stakeholders, in near real-time, as each bag is processed.
- **On flight completion:** the necessary data being exchanged could be accumulated and only exchanged on-block when the entire flight of bags has been fully processed (for example on flight departure, on last arrival bag track)

7.2.2 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 picture of the bag's journey.

Benefits in Resolution 753	Benefits to data exchange recipient			
	As each bag is processed	On Flight Completion	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 SLAs	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 which timing of data exchange will benefit them the most, also considering the cost of implementation.

7.3 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.

7.3.1 Data Exchange technologies

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

- **Data Delivery Brokers:** In this case, a 3rd party broker is used to delivery electronic data, invariably having well defined formats for the information (e.g. RP1745 messages such as BPM, BMM, BCM) from an IT system of one party to an IT system of the other party. These brokers generally operate over well established and supported networks and protocols (e.g. MQ, Web Services).
    - **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 (e.g. MQ, Web Services using RP1745 messages) 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.

7.3.2 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 exchanging of the baggage tracking data between parties.

- **RP1745 formatted 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.
- **CSV files:** 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 in order to realize any but the most cursory benefit.

8 Realising the benefits of baggage tracking

Resolution 753/30.53 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. Within this chapter, are outlined, some concrete examples of how the current scope of Resolution 753/30.53 can actually deliver some of these benefits, through the use of the tracking data beyond simply having the information on file for compliance. In reality, the benefits will be of course determined by the quality of data available.

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.

The chapter is highlighting the following scenarios:

- Transfer bags delivered to arrivals hall
- Terminating bag in sorting system
- Making the correct depart/wait decisions
- Comparing induction time with mishandling rates
- Validating the baggage segregation processes
- Knowing what's truly on-board an arriving flight
- Deterring fraudulent missing bag claims
- Spotting systematic pilferage
- Measuring baggage delivery times
- Measuring late baggage loading

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 content 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 753/30.53 tracking point – delivery of bag to passenger
- Data from this tracking point is transferred in near real time, via BPMs, to the local Baggage Reconciliation System (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 are able to 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 753/30.53 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 is able to 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 deposited into the sorter already and are only a couple of minutes away from the makeup area.

If the ground staff new that the bags were offloaded and deposited 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 753/30.53 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 can know the time and location of induction of the transfer bags.
- Seeing that the missing bags were inducted 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 753/30.53 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 (relighted, recorded in baggage tracing system etc.).

8.2.1 Scenario 1: Comparing induction 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 induction points within X minutes of departure had a greater rate of mishandling. This could then be used to set new operating procedure 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 reflighted bags from BRS and DCS reflighting and/or baggage tracing system files.
- Tracking Point from induction 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 allow a carrier to be able 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 reflighted bags from BRS and DCS reflighting and/or baggage tracing system files.
- Loading manifests - recording the bags that were loaded on departure (Resolution 753/30.53).
- Tracking data from induction to sortation - recording the transfer of baggage between member carriers (Reso 753/30.53).
- Tracking data from arrival bag delivery - recording the delivery to passengers (Resolution 753/30.53).
- Scheduled and/or actual flight departure times.

8.3 Ensuring fairer pro-rationing of mishandled bag charges

When a pro-ration 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 753/30.53) 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 753/30.53 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 departure

In the sections above, we have shown how information from Resolution 753/30.53 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 753/30.53 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 the bag is left behind at the origin and what if they belong 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. But, these bags are never going to show as they were not loaded at the arrival station.

The Resolution 753/30.53 solution: if the carriers both implement their obligation under Resolution 753/30.53, 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 mishandling baggage repatriation

When bags mishandle, it is usually the tasks 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 resulted in wasted time in getting the bag back in the hands of 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.

If a carrier invests in efforts to track their baggage under Resolution 753/30.53, and the tracking methods result in baggage messages (BPMs, BMMs) being exchanged, this opens up opportunity to share the Resolution 753/30.53 tracking data with baggage tracing teams. As tracking information (acceptance, loading, baggage exchange, and delivery) is collected to comply with Resolution 753/30.53, it can also allow these tracing agents 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 statement 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 guys in JFK have already loaded it on the next flight and it should be with use 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 753/30.53 tracking and loading touchpoints made available in near real-time to their baggage tracing system (WorldTracer, NetTracer, etc.), 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 753/30.53 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 ground handlers are measured. As airlines roll-out the tracking points needed for Resolution 753/30.53 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 current 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 advance performance statistics can be measured and process improvements made accordingly.

8.7.2 Late baggage loading.

If the Resolution 753/30.53 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-departure 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 offer to the passenger that their bags are safe, Resolution 753/30.53 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 753/30.53 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.

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.

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 baggage handling systems (BHS), baggage reconciliation systems (BRS) or arrival tracking facilities provided by an airport, a partner airline or a ground handler.

Where this infrastructure meets the requirements of Resolution 753/30.53, 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
	Induction 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
Ground Handlers 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

Use of standard baggage service messages, such as those described in IATA 1745 or future standards, is preferred.

9.2 Airports

Airports have a key role to play in generation of Resolution 753/30.53 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 & 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 753/30.53 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 Baggage Handling System[s] 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.

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 collection 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 airline 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 Ground Handlers or Handling Partners

Ground Handlers or Handling Partners are generally responsive to the requirements of the airlines they serve. In most cases, ground handlers will use airport or airline mandated systems and services. In some cases, however, handlers procure their own systems; where this is the case, handlers can help member carriers gain the same benefits described above.

The same data used by airlines and airports can also be used by Ground Handlers to demonstrate and improve staff productivity and effectiveness and optimise staffing.

10 Best Practice for Infrastructure

The guide so far has discussed the benefits of recording and exchanging the tracking data mandated by Resolution 753/30.53, and Section 7.2 discussed the merits of automated, real-time 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 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 would welcome to hear any feedback from you about your future plans for implementation: baggageservices@iata.org

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 in order to properly evaluate the best approach when considering a tracking strategy. This list is by no means exhaustive.

- Does the airport have a Baggage Reconciliation System; or are bags otherwise scanned already 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 tacking information or availability of scanning at the airline's hub operation. A number of 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 retrospectively

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
    - 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
    - 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

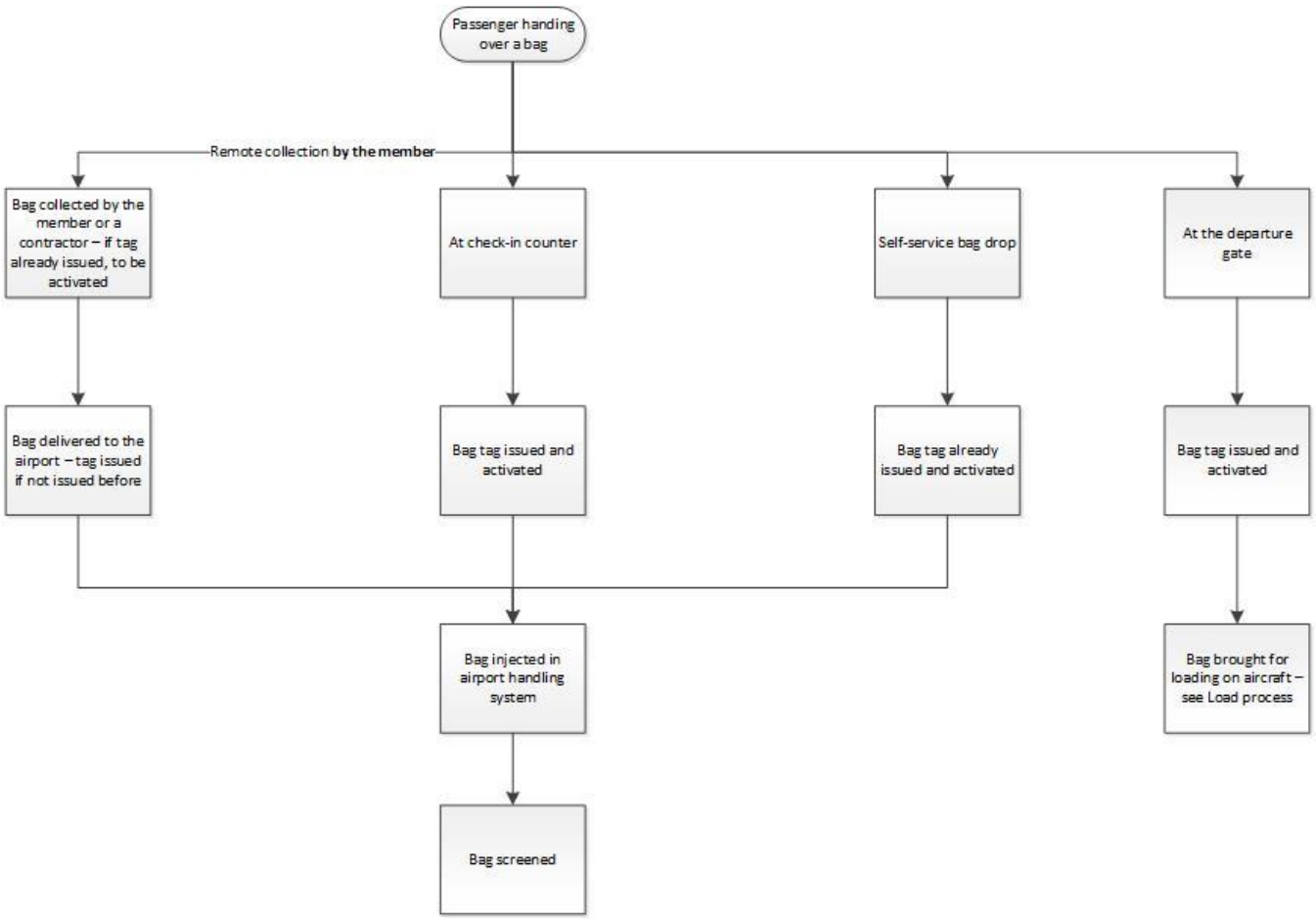
10.2 Case Studies

Appendix A (Section 15) contains a number of Airline and Airport case studies. More case studies will be added in later releases of this guide; please forward any submissions to baggageservices@iata.org.

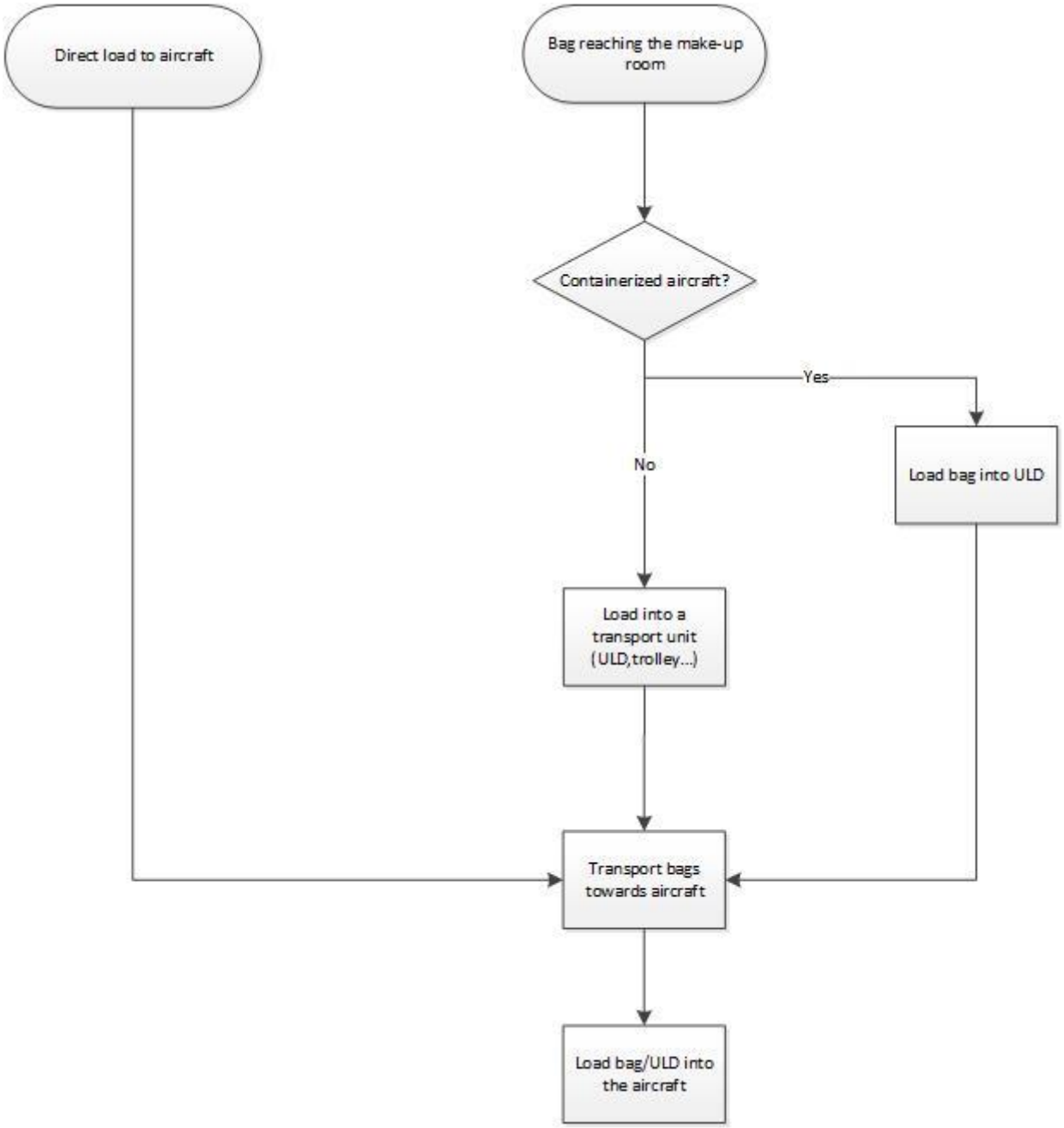
11 Sample Process Views

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

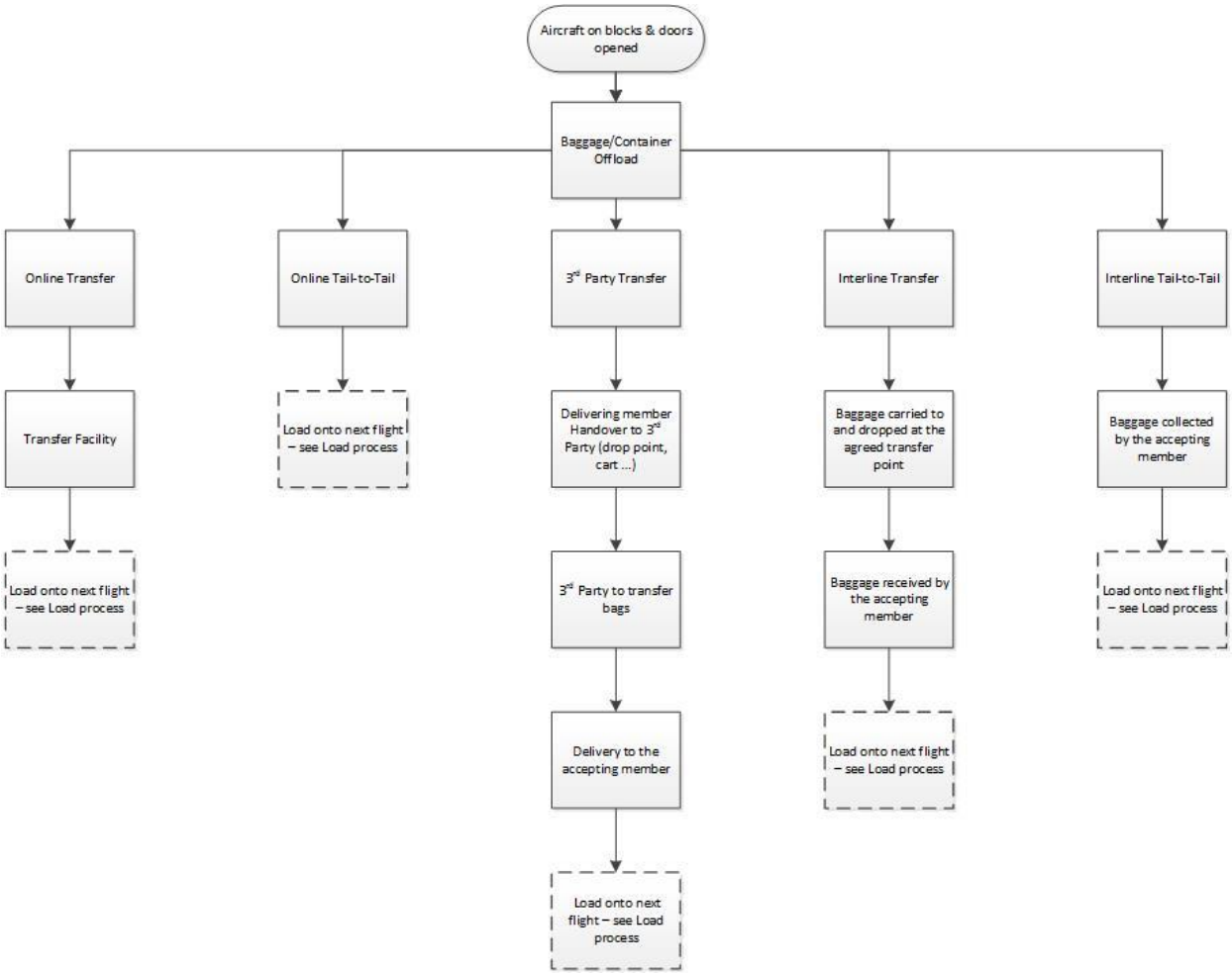
11.1 ACCEPTANCE PROCESS



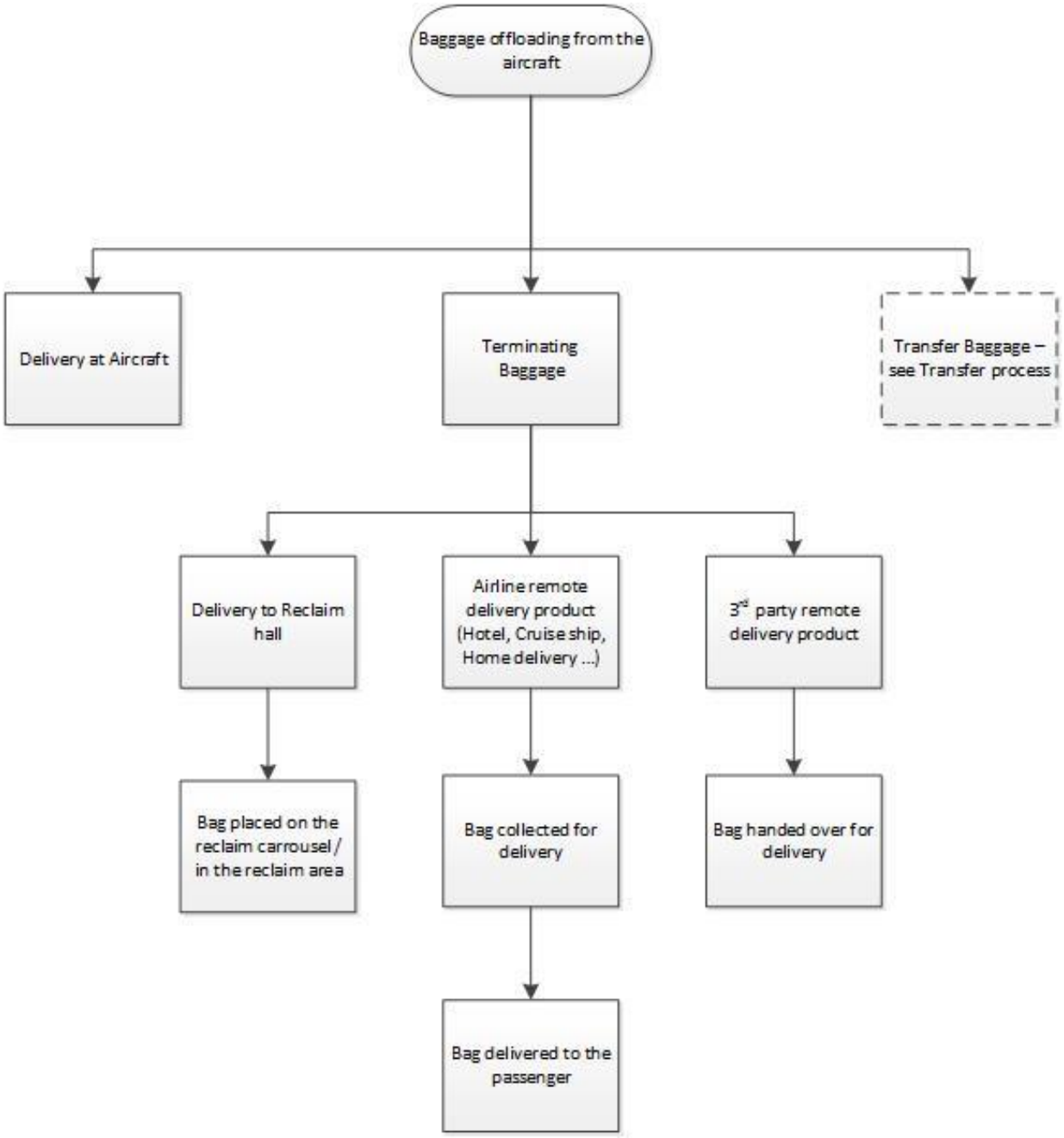
11.2 LOAD PROCESS



11.3 TRANSFER PROCESS



11.4 ARRIVAL PROCESS



12 Resolution 753/30.53 and Airport Charges

As per 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 baggage's 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 ensued.

In any case and in line with ICAO's policies on charges in Doc 9082, any cost pertaining to 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.

13 Example of Business Models for Implementation

This section will be populated in a later release of this guide.

14 List of IATA Strategic Partners

Company Name	Website	Main contact
Amadeus IT Group, SA	http://www.amadeus.com	Mrs. Pilar Antolin, Coordinator Industry Affairs, pantolin@amadeus.com
ARINC Inc. (Rockwell Collins)	https://www.rockwellcollins.com	Mr. Tony Chapman, Senior Director Strategic Partnerships, tony.chapman@arinc.com
Rimowa Electronic Tag GmbH	http://rimowa-electronictag.com	Mr. Jan Reh, CEO, jan.reh@bag2go.aero
Brock Solutions, Inc.	https://www.brocksolutions.com	Mr. Mark Stokes, Business Develop. Mgr, mstokes@brocksolutions.com
DS Tags Group BV	http://www.dstags.com	Mr. Rob Sneekes, Director Business Development, rob.sneekes@dstags.com
HomingPin Limited	https://www.homingpin.com	Mr. Andrew Hopwood, COO, andrew.hopwood@homingpin.com
Lyngsoe Systems A/S	http://www.lyngsoesystems.com	Mrs. Kristine Koldkjaer, Product Manager, kpk@lyngsoesystems.com
Longest Chance Limited	http://www.longestchance.com	Mr. Alexandr Tsybouk, CTO, a.tsybouk@longestchance.com
Narita International Airport Corporation (NAA)	http://www.narita-airport.jp/en/index.html	Mr. Ken Murayama, VP Planning Development, k-murayama@naa.jp
Nettracer	http://nettracer.aero	Mr. John Spears, VP, jspears@nettracer.aero
Quantum Aviation Solutions	http://quantum.aero	Mr. David Kennedy, President, david.kennedy@quantum.aero
Siemens Postal, Parcel & Airport Logistics GmbH	www.siemens.com/logistics	Mr Juergen Schad Juergen.schad@siemens.com
SITA	http://www.sita.aero	Mr. Nigel Pickford, Director Marketing Operations and Insight, Nigel.Pickford@sita.aero
Toppan Forms Co., Ltd.	http://www.toppan-f.co.jp/39nglish	Mr. Hada Masayuki, hada@toppan-f.co.jp
Toyo Kanetsu Solutions K.K.	http://www.toyokanetsu.co.jp/global	Mr. Kazuhiro SHIMAFUJI, General Manager Overseas Business Dev., shimafuji@toyokanetsu.co.jp
Ultra Electronics Airport Systems	https://www.ultra-as.com	Mr. Shaun Penton, Portfolio Manager, shaun.penton@ultra-as.com
Vanguard ID Systems	http://www.vanguardid.com	Mr. Alan Neves, National RFID Account Manager, alan@vanguardid.com

Zafire	http://www.zafire.com	Rachel Wesson, Head of Sales & Marketing rwesson@Zafire.com

15 Appendix A – Case Studies

15.1 Use Case – 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 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 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.

3. ULD position in hold

The ULD containing the bag is brought under 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 come under the aircraft and unload ULD and bulk. They scan ULD and bulk so that, thanks to ULD inheritance, all bag status are known.

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

5. Bag exchange and BHS

ULDs arrive at BHS. Each bag is retrieve from the ULD and drops off 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 AF bag tracking viewer so that AF can follow the bag in 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 under 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.

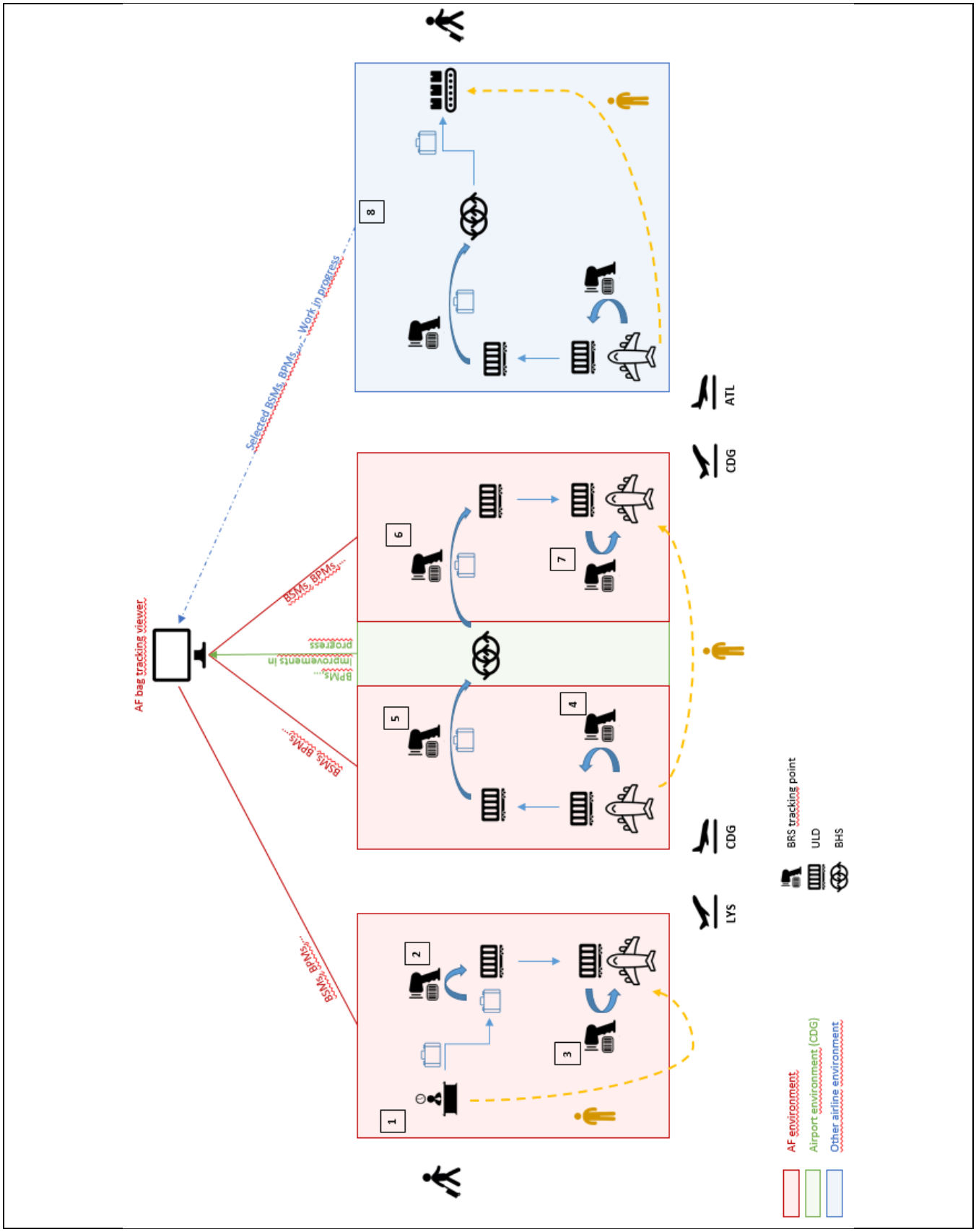
… Mr. X lands at ATL.

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 works together to share BSMs and BPMs and BMMs in certain cases so that they will be compliant with RP753.

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


AF environment
Airport environment (CDG)
Other airline environment
BRS tracking point
ULD
BHS
LYS
CDG
CDG
ATL
AF bag tracking viewer
BSMs, BPMs...
BPMs improvements in progress
BSMs, BPMs...
BSMs, BPMs...
Selected BSMs, BPMs... Work in progress
1
2
3
4
5
6
7
8

15.2 Use Case – Etihad and Luggage Logistics

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 (WiFi / mobile network coverage etc.). This option was discarded.
- Do nothing: that option wouldn't have helped us in implementing 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 753 compliance, information shall be added early enough to allow for planning and review.

15.3 Use case – LH and Fraport

Model study „infrastructure meets messaging“

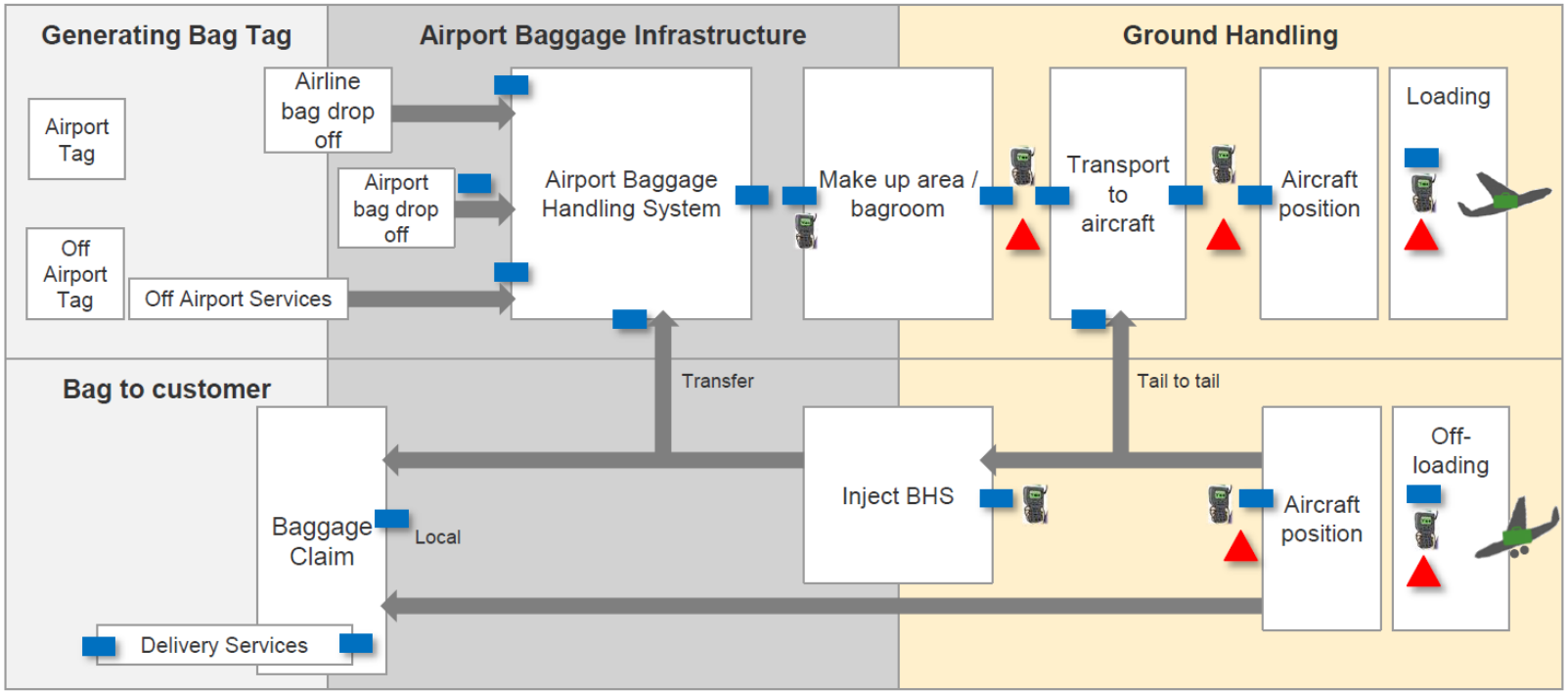
based on: „Airports & Lufthansa Group for 753“-Team

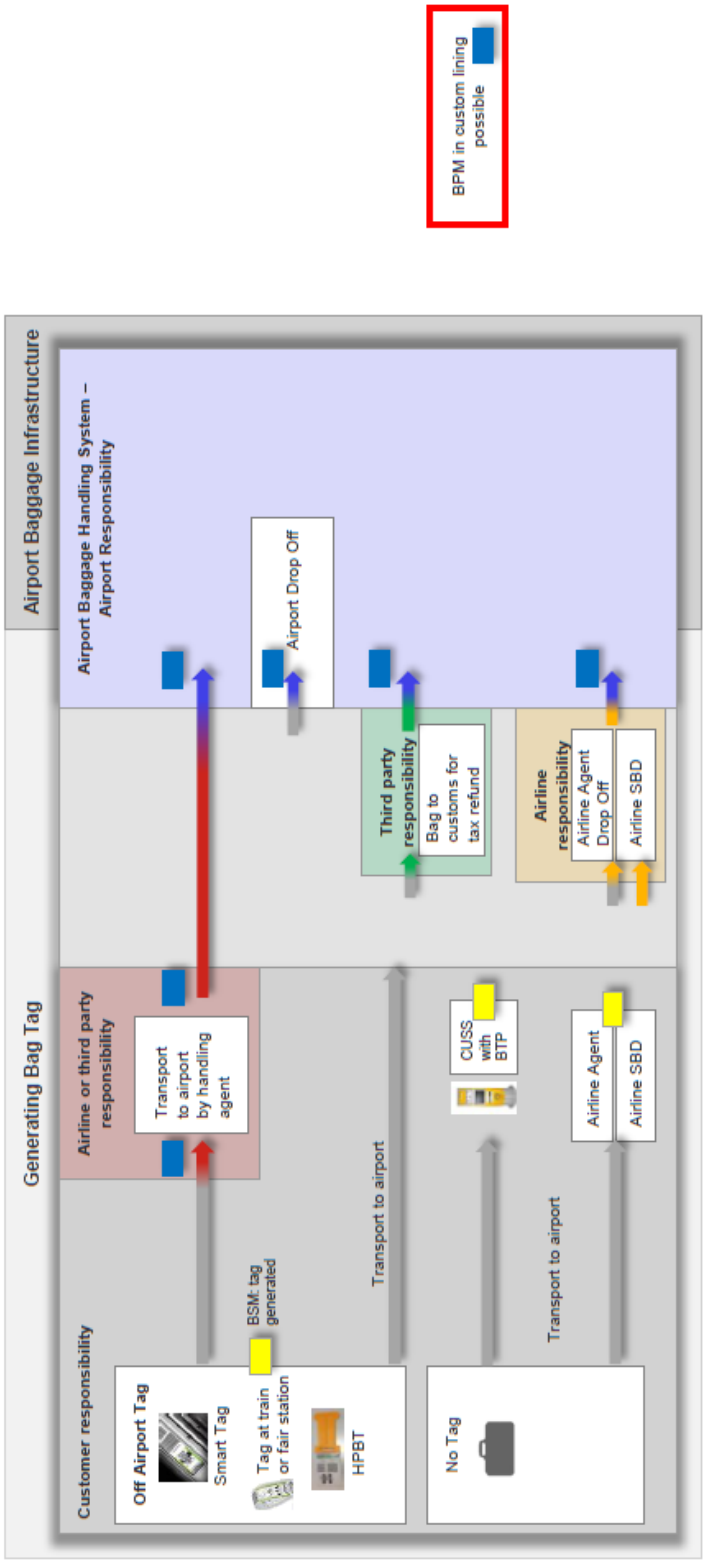
The model study contains the tracking points along the journey of customer baggage considering IATA Reso753.

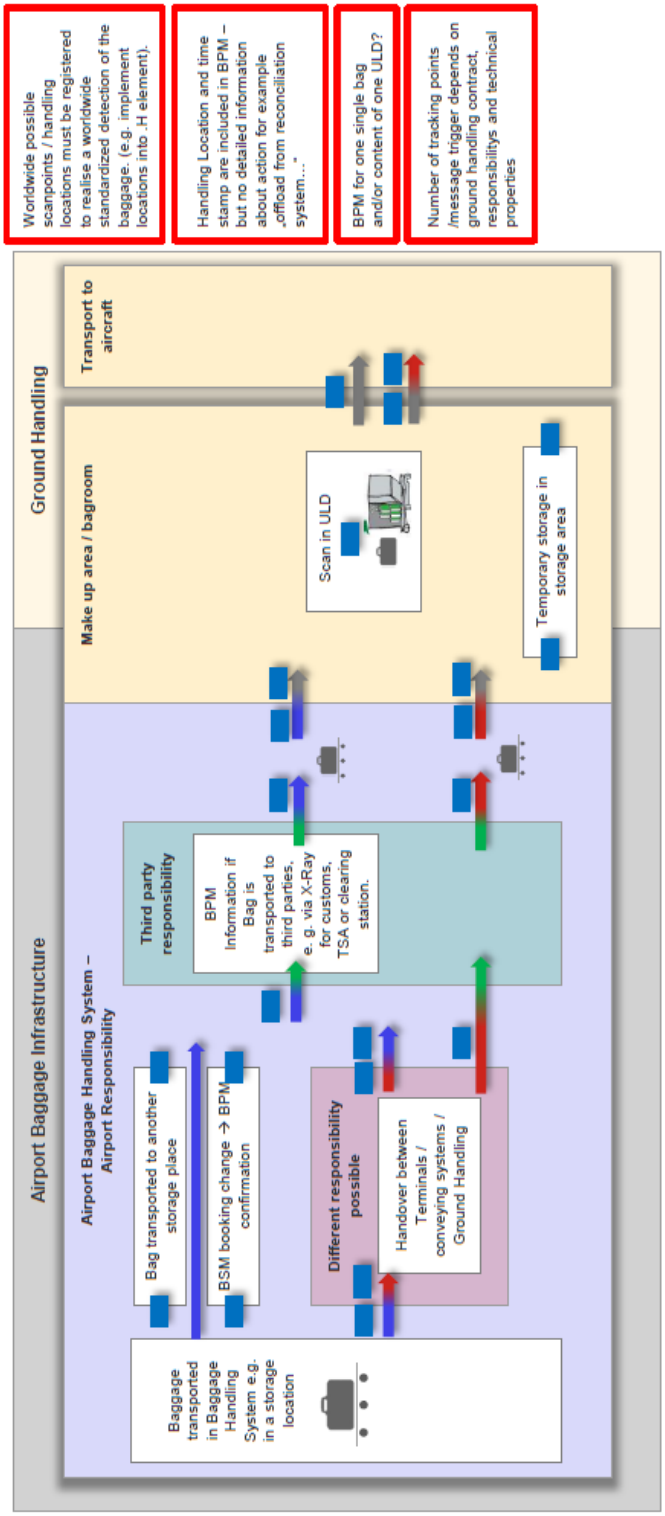
Conditions are the use/upgrade of existing infrastructure (hardware/software) e.g. a BRS-System as well as a consequent transmission of standardized IATA baggage messages (RP1745) between airlines and airports.

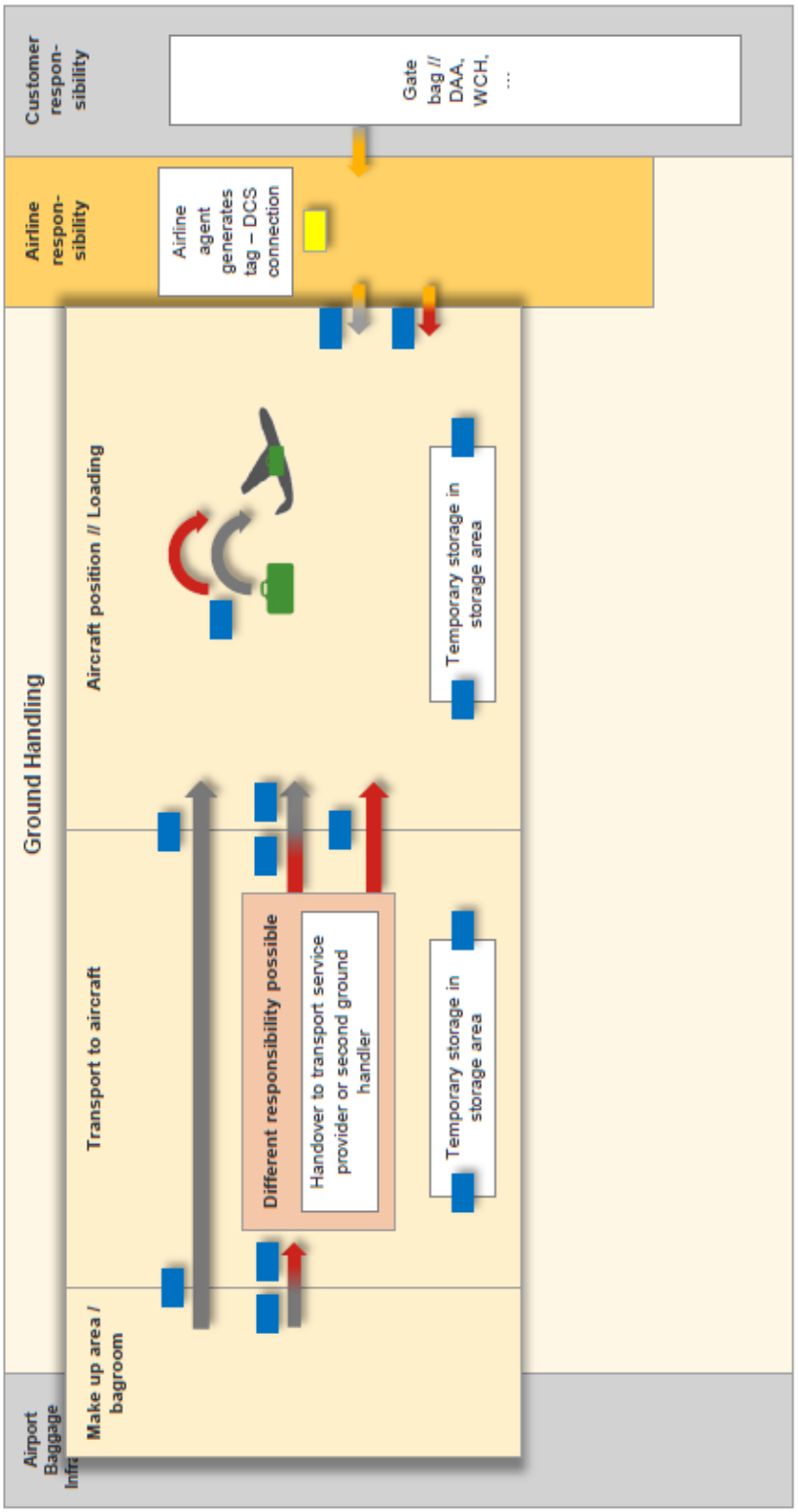
The study is based on our expert group of the airports FRA, MUC, VIE, ZHR and the Lufthansa Group.

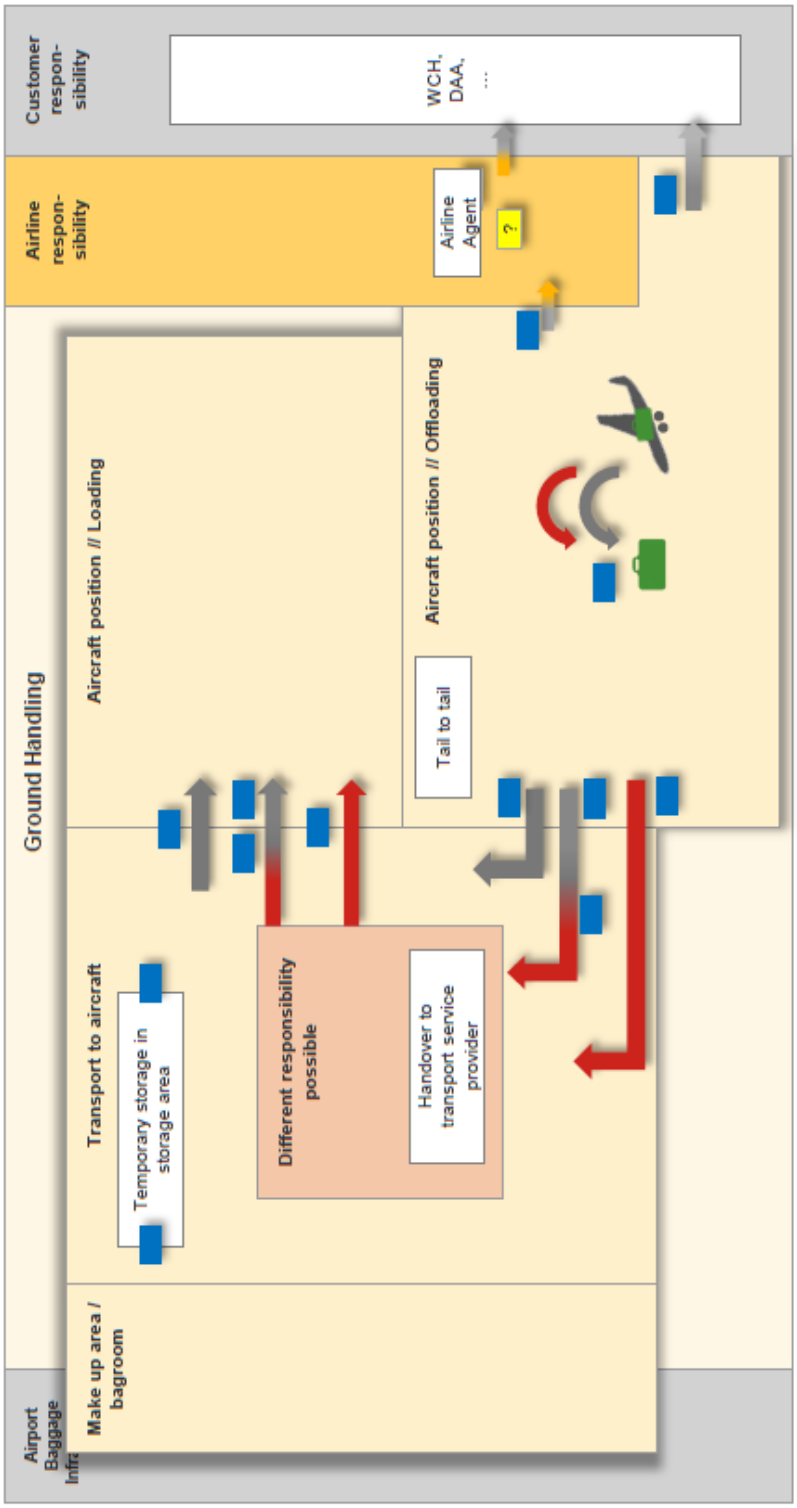
Graphic explanation follows on the next page…

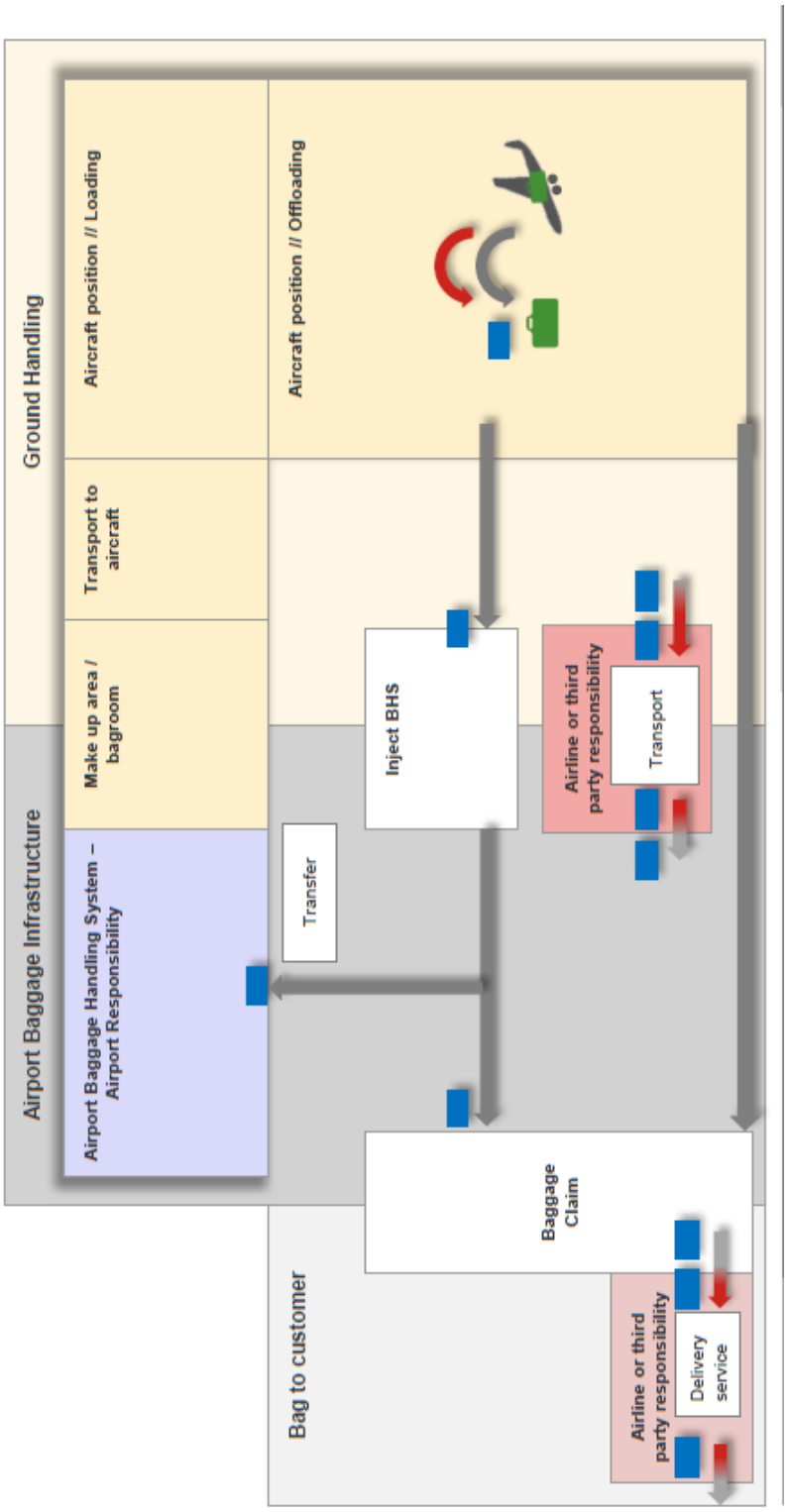

Generating Bag Tag
Airport Baggage Infrastructure
Ground Handling
Airport Tag
Airline bag drop off
Airport bag drop off
Off Airport Tag
Off Airport Services
Airport Baggage Handling System
Make up area / bagroom
Transport to aircraft
Aircraft position
Loading
Transfer
Tail to tail
Bag to customer
Baggage Claim
Local
Delivery Services
Inject BHS
Aircraft position
Off-loading
Model study "infrastructure meets messaging" based on "Airports & Lufthansa Group for 753" - Team Seite 2
= 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

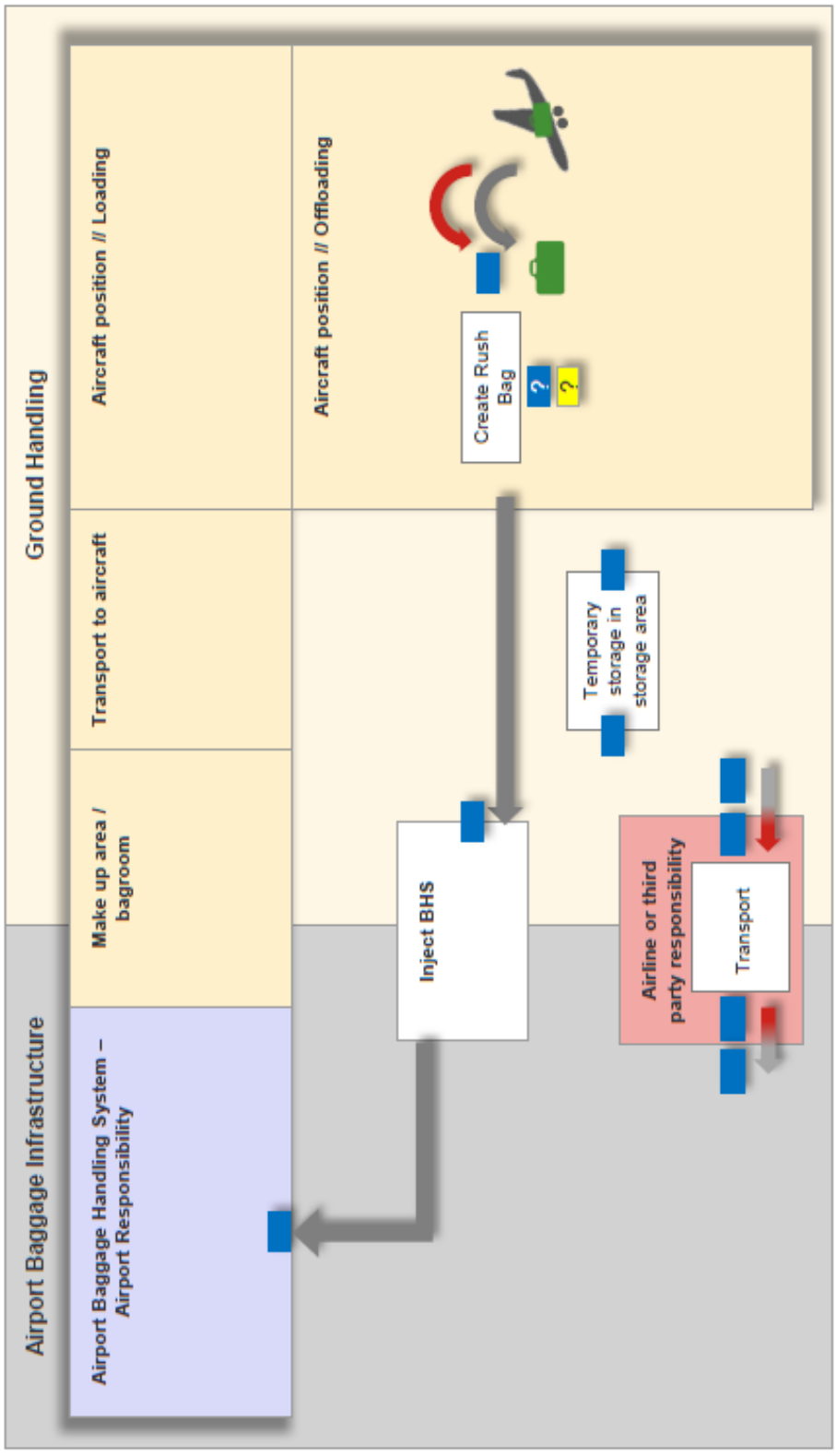

BPM in custom lining possible
Airport Baggage Infrastructure
Airport Baggage Handling System – Airport Responsibility
Airport Drop Off
Third party responsibility
Bag to customs for tax refund
Airline responsibility
Airline Agent Drop Off
Airline SBD
Generating Bag Tag
Airline or third party responsibility
Transport to airport by handling agent
CUSS with BTP
Airline Agent
Airline SBD
Transport to airport
Transport to airport
Customer responsibility
Off Airport Tag
Smart Tag
Tag at train or fair station
HPBT
BSM: tag generated
No Tag

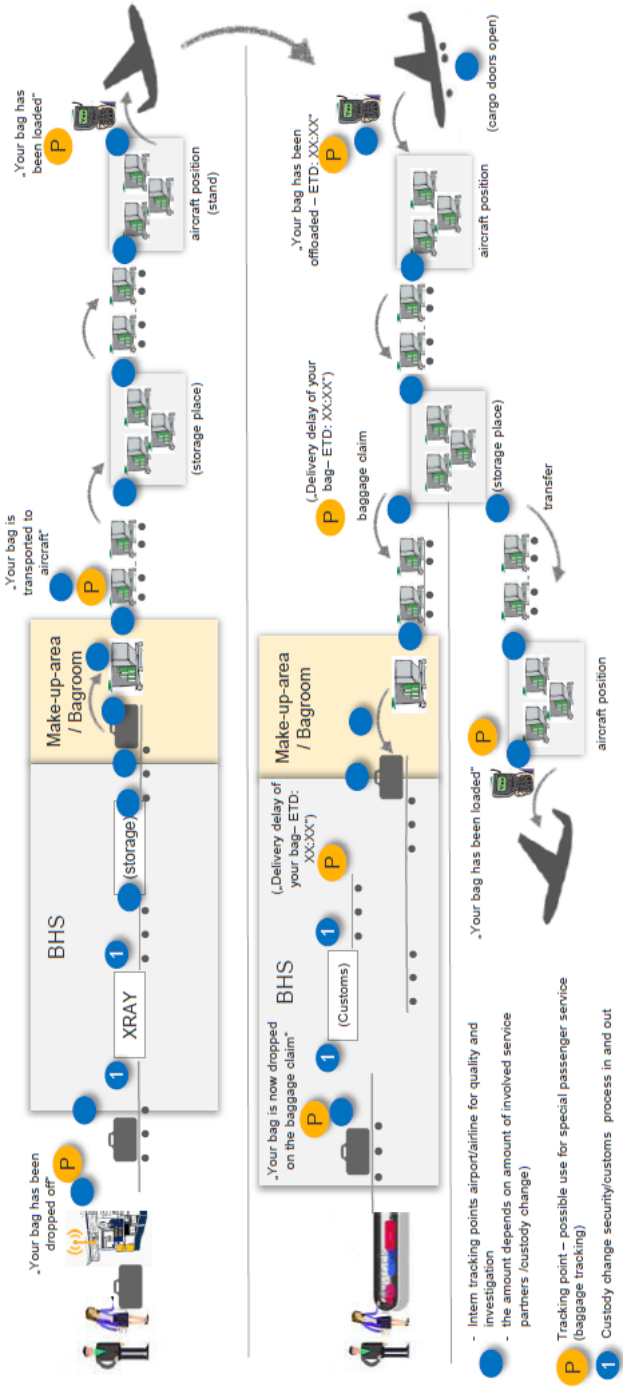

Worldwide possible scanpoints / handling locations must be registered to realise a worldwide standardized detection of the baggage. (e.g. implement locations into .H element).
Handling Location and time stamp are included in BPM – but no detailed information about action for example „offload from reconciliation system..."
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
Ground Handling
Transport to aircraft
Make up area / bagroom
Scan in ULD
Temporary storage in storage area
Airport Baggage Infrastructure
Airport Baggage Handling System – Airport Responsibility
Third party responsibility
BPM Information if Bag is transported to third parties, e. g. via X-Ray for customs, TSA or clearing station.
Bag transported to another storage place
BSM booking change → BPM confirmation
Different responsibility possible
Handover between Terminals / conveying systems / Ground Handling
Baggage transported in Baggage Handling System e.g. in a storage location


Customer respon-sibility
Gate bag // DAA, WCH, ...
Airline respon-sibility
Airline agent generates tag – DCS connection
Ground Handling
Aircraft position // Loading
Temporary storage in storage area
Transport to aircraft
Different responsibility possible
Handover to transport service provider or second ground handler
Temporary storage in storage area
Make up area / bagroom
Airport Baggage Infra


Customer respon-sibility
WCH, DAA, ...
Airline respon-sibility
Airline Agent
?
Ground Handling
Aircraft position // Loading
Aircraft position // Offloading
Tail to tail
Transport to aircraft
Temporary storage in storage area
Different responsibility possible
Handover to transport service provider
Make up area / bagroom
Airport Baggage Infra


Ground Handling
Aircraft position // Loading
Aircraft position // Offloading
Transport to aircraft
Make up area / bagroom
Airport Baggage Infrastructure
Airport Baggage Handling System – Airport Responsibility
Transfer
Inject BHS
Airline or third party responsibility
Transport
Bag to customer
Baggage Claim
Airline or third party responsibility
Delivery service


Ground Handling
Aircraft position // Loading
Transport to aircraft
Make up area / bagroom
Aircraft position // Offloading
Create Rush Bag
Temporary storage in storage area
Inject BHS
Airline or third party responsibility
Transport
Airport Baggage Infrastructure
Airport Baggage Handling System – Airport Responsibility


„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
(storage place)
transfer
„Your bag has been offloaded – ETD: XX:XX"
aircraft position
(cargo doors open)
„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

16 Appendix B – Baggage tracking action sheet

Baggage Tracking Documents

The key documents related to baggage tracking are:

- IATA Resolution 753/A4A Resolution 30.53
- Baggage Tracking IATA Resolution 753/A4A Resolution 30.35 Implementation Guide (including the list of industry providers recommended by IATA)

Please contact IATA (baggage@iata.org) to obtain a copy of these documents.

Considerations for Airlines

- **Baggage Tracking implementation at your hub**

☐ Are there any plans for 753/30.53 implementation coming from your baggage services department in your Hub?

☐ What is the timeline for implementation?

☐ How is your hub airport implementing 753/30.53?

- **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 753/30.53 at every station.

Contact station managers to find out:

☐ Are they familiar with Resolution 753/30.53 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"? And has your airline been "in" (switched on…)

☐ Do you have any existing agreements between your airline, ground handler(s) and airport related to baggage tracking?

☐ Has Resolution 753/30.53 been discussed through the Airport Operation Committee? Do they have some common approach?

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

☐ Which solution might be the optimal for the implementation of Resolution 753/30.53 at each station?

- **Baggage messaging sharing**

☐ Do you have a plan for baggage message sharing?

(Please note that sharing of the baggage data is only between interline carriers involved in the passenger journey.)

Considerations for Airports

- **Baggage Tracking implementation at an airport**

☐ Have you received requests from airlines to implement 753/30.53?
☐ Are you engaging with airlines individually or through the AOC for 753/30.53 implementation?
☐ Do you have a timeline for implementation?
☐ How are you implementing 753/30.53 at your airport?

- **Baggage messaging sharing**

☐ Do you already have the data needed? For example:
  - Acquisition of the bag
  - Tracking data from sorting process
  - Induction of transfer bags
  - BRS loading operations
  - Common Use arrival tracking facilities

- **New forum to discuss implementation issues**

IATA/A4A plan to establish a Joint 753/30.53 Implementation Sub-Group for both airlines and airports stakeholders that would discuss implementation issues through conference calls and webinars.

If you wish to be part of that Sub-Group please contact Magali Collot at collotm@iata.org

17 Appendix C – List of contributors

IATA would like to thank the following contributors to Issue 1 of this Implementation guide:

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