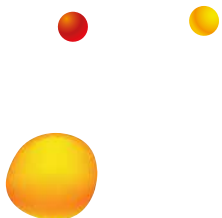
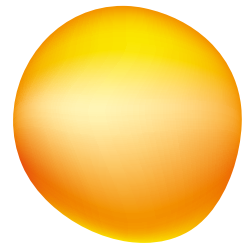




2016

AIR TRANSPORT INDUSTRY INSIGHTS

THE BAGGAGE REPORT



In association with

Air Transport World

SITA

Create success. Together

FOREWORD

Despite the sluggish global economy over recent years, air travel has continued to transport an ever increasing number of travelers and their belongings around the globe. 2015 was no exception, with an extra 218 million passengers boarded during the year. Remarkably though, our WorldTracer data shows the baggage mishandling rate reached an all-time low last year, underlining the positive impact that the industry's investments and innovations in baggage management are having.

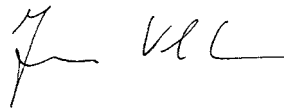
There is no sign that the growth in air travel will slow and this demand will increase the pressure on the industry's infrastructure, resources and baggage handling systems. Further improvements in baggage handling will require a step change.

Bag tracking will be in the spotlight over the next three years as airlines work to ensure they can track each bag throughout its entire journey in readiness for the implementation of the International Air Transport Association's Resolution 753. This resolution will require airlines to track each bag onto the aircraft, into arrivals areas and even transfer systems, and must be implemented by June 2018. The tracking information will be shared with all involved in delivering the baggage back to the passenger at the final destination.

Several major airline and airport bag-tracking initiatives were launched in 2015 to address the requirements of Resolution 753. This will give airlines and their partners more visibility and control over each stage of the bag's journey, driving further improvements in baggage handling.

In particular, the ability of passengers to track their bag, just like a parcel, will go a long way to relieving their stress as they wait at the baggage carousel for its arrival. Furthermore, it will empower passengers to take remedial action if their bags are delayed.

For airlines and their industry partners, the ability to share information will create opportunities to proactively offer passengers solutions when luggage is delayed or flights are disrupted. Ultimately, it will drive down the cost of bag mishandling even further.



Francesco Violante
Chief Executive Officer, SITA

BAGGAGE FACTS AT-A-GLANCE

3.5 BILLION PASSENGERS ENPLANED IN 2015

6.5 MISHANDLED BAGS PER THOUSAND PASSENGERS IN 2015

50.7% CUT IN TOTAL MISHANDLED BAGS SINCE 2007

US\$22.4BN GLOBAL SAVINGS SINCE 2007

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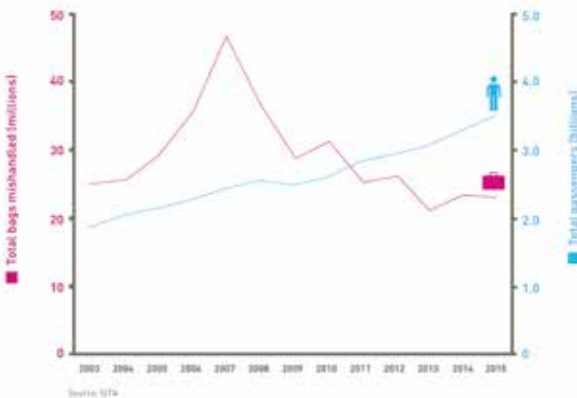
KEY BAGGAGE TRENDS

OVERVIEW

Although there have been many improvements in recent years, baggage handling continues to be one of the single largest bottlenecks to a streamlined passenger process and an efficient air transport business model. This report outlines the increased collective effort by airlines, airports and ground handlers to address this issue.

The latest estimates by the International Air Transport Association (IATA) predict that passenger numbers have grown by almost 7% to reach 3.54 billion passengers in 2015.¹ There is no sign that this growth will slow as IATA's expectation is that by 2034 passenger numbers will have doubled to 7 billion.²

+1.6BN PASSENGER GROWTH, WITH MISHANDLED BAGS RATE DECREASE



Against this backdrop, industry initiatives to tackle mishandled bags are bearing fruit. SITA's WorldTracer data for 2015 reveals the total number of mishandled bags is down by almost 5% - reduced to 23.1 million, from 24.3 million, in 2014. Taking into account the increase in passenger numbers in 2015, this means the mishandling rate has dropped to 6.53 bags per thousand passengers – a 10.5% decrease from the previous year. This represents an all-time low in the mishandling rate since SITA began reporting baggage handling trends in 2003.

Mishandled bags cost the aviation industry \$2.3 billion in 2015, a 3.75% reduction from 2014. The bag mishandling cost per passenger has dropped 9.7% to \$0.65 – another all-time

low – thanks again to the bag handling improvements despite higher passenger numbers.

Over the longer term, the decline in mishandled bags is even more marked. In 2007 the total number of mishandled bags reached a high of 46.9 million and over the last nine years that number has been reduced by 50%. In the same period, the total cost of bag mishandling to the industry, which stood at \$4.2 billion in 2007, has been cut by 45%.

2003-2015: PERFORMANCE IMPROVEMENTS



PASSENGERS EXPECT TO MAKE MORE USE OF SELF-SERVICE BAG-DROP

From the passengers' perspective, widespread adoption of self-service baggage processes is still some way off, according to SITA's 2015 Passenger IT Trends Survey. However, there are signs that confidence is growing as passengers intend to make more use of self-service technologies on their next flight. Passengers are also eager for new baggage information services on their mobile devices to relieve the stress of waiting at the carousel for their luggage.

Globally, almost one in five passengers takes only carry-on bags when they fly; while the majority check in one or more of their bags, with passengers checking in an average of 1.2 bags in 2015. Furthermore their positive feelings are running high during bag-tagging and bag-drop, with around 80% or more experiencing positive emotions during these phases of their journey.³



Most passengers used an airline check-in counter to drop off their luggage in 2015, while a fifth used either a staffed or fully automatic bag-drop.⁴ Their preference is for staffed stations as they still have to gain confidence in unstaffed bag-drops.⁵ But thinking ahead to their next flight, almost a third of passengers expect to be using bag-drop – either a dedicated staffed station or fully self-service – in 2016.⁶



20%
OF PASSENGERS USED SELF BAG-DROP ON LAST FLIGHT



31%
OF PASSENGERS INTEND TO USE SELF BAG-DROP ON NEXT FLIGHT

Behind these global figures there are some interesting regional variations, which vividly bring to life passengers' intentions to utilize self-service baggage technology this year. In 2015 Australian passengers were leading the world in the adoption of self-service bag-drop, with 26% of domestic passengers processing their bags themselves rather than going to an airport counter – well ahead of the 20% global average.

Not far behind Australia, UK airline passengers are among the highest users of technology to manage their travel experience, with 24% using bag-drop technology to check-in their luggage. The expectation is for this figure to grow rapidly this year.

In both Mexico and Brazil, the overwhelming number of passengers check in their bags when they fly. In 2015, about a quarter of passengers in Mexico and less than one in five in Brazil used self bag-drop. However, the desire to use this service is growing, with around a third or more passengers in both countries saying they would use self bag-drop on their next trip.⁷

Meanwhile in the USA, a majority of passengers still check their bags at an airport desk. However, momentum is building for alternatives to the airport counter, with off-airport baggage drops and self-service bag-drops each used by around one in five passengers.⁸

While passengers in China are keen to embrace off-airport check-in using their personal technology, those traveling with luggage are still largely processed at airline check-in counters, according to SITA's 2016 report, *Towards a Mobile Optimized Journey in China*. Self-service bag-drop technology is a relatively new concept in the Chinese market. It is yet to become well integrated into self-service processing, and many deployments are still at proof of concept or trial stage. As a result, passenger usage is currently low at around 8%. Nevertheless, almost a third of Chinese passengers say they would use the service for their next flight if it was available.⁹

While at the other end of the passenger journey, based on their own perception of their last flight, just over two fifths of passengers across the globe collected their bags within 10 minutes of arriving at the carousel, and roughly the same number waited between 10 and 30 minutes.¹⁰

The high level of positive emotions that passengers feel at the earlier stages in their journey, take a dip at bag collection, when almost a third of passengers confess to feeling negative emotions of anxiety and anger (only the security process stimulates a higher level of distress).¹¹

However, the industry has a real opportunity to relieve passenger concerns at the baggage carousel as there is considerable pent up demand for information – the vast majority of passengers (96%) would be interested in receiving bag collection updates on their mobile device.¹²





AIRLINES AND AIRPORTS ACCELERATE SELF-SERVICE BAG-DROP OPTIONS

The next three years will see a rapid acceleration in self-service baggage options to help passengers quickly check-in their bags at the airport, according to SITA's 2015 Airline IT Trends and Airport IT Trends Surveys. Broadly, two fifths of airlines and airports now provide self bag-tag printing at kiosks and over three quarters are expected to have the service in place by 2018.¹³



77%
of airlines to implement self bag-tagging by 2018



88%
of airports to implement self bag-tagging by 2018

Airports are leading the way with implementations of staffed bag-drop stations: almost half of all airports now have this service and the overwhelming majority have plans to implement by 2018.¹⁴ Airlines are currently a step or two behind them, but over three quarters expect to have assisted bag-drops in place in the next three years.¹⁵ Less than one in five airports and airlines currently offer passengers fully self-service bag stations, but most have plans and nearly three quarters expect to implement them by 2018.¹⁶

The air transport community as a whole also has plans to alleviate the stress of baggage collection. It is early days for the roll out of beacon technology, but around 40% of airlines and airports expect to be leveraging sensors at baggage claim

in the coming three years. Some 40% of airlines intend to use these beacons to determine where the passenger is, to better facilitate luggage collection.¹⁷

Sending baggage location status updates to passengers' smart devices has yet to gain much traction, but by 2018 around 60% of airlines expect to be offering these services.¹⁸

Providing passengers with self-service tools to take action when their bags are delayed or missing will also achieve more widespread adoption in the next three years. In this time, the majority of airlines will be sending missing bag communications to passengers' smartphones and tablet apps. In addition, they will offer reporting of missing bags via these devices. Airports are enhancing airline efforts by implementing self-service reporting of lost bags on kiosks or mobile devices, with a third offering this by 2018.¹⁹



INNOVATION

OVERVIEW

The focus for airlines and airports now, and over the next few years, is on giving their passengers more baggage self-service options to suit their needs, making the processes even simpler and the journey less stressful. As well as looking to improve services, the air transport community is ensuring that utilization of their resources is maximized and they will have the flexibility to meet future demands as passenger numbers continue to rise.

MORE OPTIONS FOR SELF-TAGGING

As the facility for passengers to print their own bag-tags at a kiosk becomes the norm over the next three years, airlines are starting to turn their attention to alternative options for passengers to take control of their bag-tags. The past year has seen some progress on permanent electronic tags and some airlines trialing, or soft-launching, home-printed bag-tags.

Airlines are also keeping an eye on ensuring their self-service investments today are future-proofed to take advantage of upcoming baggage processes at the airport. By January 2016, Air France-KLM had deployed almost 765 state-of-the-art self-service kiosks at its hubs in Amsterdam and Paris, and ultimately these kiosks will be available across 50 airports in the airline group's network. To support the move to self bag-tagging, the kiosks are equipped with extra storage for tags, and to facilitate responsive customer service. They are also equipped with audio and camera features for remote support from airline staff. Looking ahead, the kiosks will accommodate future services such as check-in and payment using near field communication technology.

Nicolas Nelson, Vice President Distributed Services IS Group, Air France-KLM Group, said: "The New Generation Kiosk project is a strategic project for Air France-KLM, aimed at significantly improving the self-service experience in 50 airports worldwide. With these 765 state-of-the-art kiosks from SITA, we are providing a solution that will improve the self-service experience for check-in, self-tagging and

baggage recovery. The initial feedback from our customers and station managers is very positive, with reports of increased availability, better user interface and improved self-service use ratios."

Electronic bag-tags look set to gain a foothold in 2016, following on from IATA and Airlines for America approving coordinated standards relating to the definition and requirements of electronic tags in 2014 and subsequent work in the industry to iron out the practical issues. "Using Bluetooth Low Energy with safeguards to prevent transmission in flight, and non-lithium batteries has allowed for some of these tags to now enter the market, and they have been well received by passengers who use them." said **Andrew Price, Head of Airport Operations Management, IATA**.

In 2015, several commercial solutions threw their hats into the electronic bag-tag ring. They included DS TAGS, which claimed a world first in April with the launch of a secure, airline-independent permanent tag solution that fully supports interlining. In the autumn, luggage company Rimowa, in collaboration with Lufthansa, extensively tested its digital data module incorporated into a suitcase. Since mid-March 2016, Lufthansa passengers can update the Rimowa tag with their flight information using the Lufthansa app on their smartphone to transfer data, via Bluetooth, from their digital boarding pass. This will allow passengers to check-in bags at home or on the road. At the airport they simply place their bag on the conveyor at the Lufthansa bag-drop desk.

While it may be argued that these electronic tags have greatest appeal for a niche group of frequent flyers, the air transport community is also working towards a simple mass market solution – home-printed bag-tags. Regulatory authorities in many countries have granted approval for the use of home-printed bag-tags, although the European Union is still at the trial and assessment stage.



HOME-PRINTED TAGS GATHER MOMENTUM

Outside the European Union, a few more airlines joined the ranks of those offering this service in 2015. In April, AirAsia launched Home Tag at Johor Bahru's Senai International Airport in Malaysia for flights to Kuching and Kuala Lumpur. The service allows guests to print their bag-tags at home along with their boarding pass. The tag is folded and placed into a Home Tag Sleeve, which is attached to the bag, and then the bag is deposited at the self bag-drop counter. The low cost carrier is currently working to make Home Tag available throughout its regional network.

In August, Swiss Airlines launched home bag-tag printing for any of its flights departing from Geneva, going on to deploy the service at Zurich Airport at the beginning of September. The facility allows passengers to print up to four bag-tags as part of the online check-in process. These tags are folded and inserted into re-usable transparent plastic pouches. At the airport, the registered and tagged baggage can be handed in, either at the self-service bag-drop machine or at any staffed bag-drop desk. The airline also offers this facility for selected inbound flights from stations outside the European Union to these airports.

"We are pleased to be one of the first European airlines to provide this service. It responds to the growing expectations of our passengers in terms of shorter waiting times and independence in their trips. With this new opportunity, we want to continue offering innovative and practical services to our Western Switzerland customers", commented **Lorenzo Stoll, Head of Western Switzerland at SWISS**.

Xavier Wohlschlag, Operations Director, Genève Aéroport, shared the same enthusiasm, saying: "For many years, Genève Aéroport has been involved alongside airlines and ground handling companies in testing new techniques and procedures that would enhance passengers' experience and shorten the time that separates travelers from the airport door to the aircraft. In this regard, this SWISS initiative is a significant step forward."

Although home-printed tags have been tested within the European Union, it will require IATA to reach agreement with customs authorities before the service can be fully implemented. Further progress towards this goal is expected in 2016.

NEXT STEPS FOR HOME-PRINTED TAGS IN EUROPE

"Although a home-printed bag-tag is equivalent to a conventional tag, regulatory authorities do require some convincing before endorsing their use. Approval has now been granted in many countries, in particular the USA and Canada, much of Latin America, China and Australia.

However, within the European Union the specific customs and tax controls between European Member States has led to greater scrutiny of the tag format than elsewhere. Colloquially referred to as the 'green stripe' issue, all flights departing from an EU airport must use a tag format that includes a green stripe.

Since 2013, IATA has been working with the European Commission and the Member States to adapt the EU regulation and the tag template. To this end, an extended

test period of home-printed bag-tag use within the normal operational environment began in early December 2015. Initially limited to four airlines and 10 European hub airports, preliminary findings supported expansion of the trial. With more airlines at more airports enabling home-printed tags under these controlled conditions, customs officials from the different EU Member States can fully assess the impact of the new EU home-printed bag-tag format on their operations and propose adjustments to the tag.

Pending final assessment of the tag format, tag holders and operational processes, a proposal for revised wording of the European customs code may be submitted. It is hoped that this will happen before May 2016."

Anne Carnall Implementation Manager, Fast Travel Program, IATA



SOLUTIONS FOR BAGS SEPARATED FROM THEIR TAGS

A percentage of bags each year become separated from their tag, creating headaches for their owners and the air transport community alike. But a new solution is in hand. “Tagless bags represent a serious cost to the airlines and a major disappointment to the passenger, as unlike the vast majority of mishandled bags that are eventually returned to the passenger, these bags are the ones that are most likely to be truly lost,” said Andrew Price.

“There are long standing simple solutions, such as name and address tags written and attached to the bag at the check-in. These have their own drawbacks though – the time to complete them delays the flow of passengers, and the inclusion of names, phone numbers and addresses on the outside of the bag introduces privacy concerns and an opportunity for social engineering attacks. Frequent flyers have attached their cards to their bags as additional methods of identification, which have been used to trace bags to owners in SITA WorldTracer and recently luggage tagging companies have emerged to try and provide an additional means to identify the bag’s owner without giving away personal information on the bag. To assist the baggage tracing community, SITA pioneered a new integration service with these luggage tag companies called the Unique Identification Service (UIS). The anonymous tag, when found on the bag, is entered into WorldTracer, which then can use this as an additional means to provide a strong tracing match to return the bag to the owner while notifying the passenger via the luggage tag company.”

BAG-DROP INITIATIVES TO MEET THE NEEDS OF ALL USERS

Self-service bag-drop innovations in 2015 have been focused on creating greater flexibility, to allow airports and their partners to maximize use of their resources and to provide their passengers with services that best fit their needs. Looking ahead, there will be initiatives to make self-service bag-drop increasingly simpler for passengers.



In November, Virgin Australia became the launch partner for SITA’s common-use hybrid desks, which were installed at Perth Airport’s new domestic terminal. The hybrid desks can

quickly switch from self-service bag-drop mode to full-service traditional counters, allowing the airline to provide varying levels of self-service, based on passenger preferences. These hybrid desks are the world’s first implementation of the latest IATA specifications, which support both agent desk operations and self-service bag-drop using a single set of hardware. They set a new standard for airports and airlines not only in Australia, but around the world.

Many airports moving to self-service bag-drop also install a retrofit to allow them to use check-in desks for manual back up, but a hybrid common-use solution generates operational cost savings. **Rico Barandun, Portfolio Director Airport Self-Service, SITA**, said: “All the retrofit solutions are independent of each other. In Perth, one set of IT equipment drives both check-in or self-service bag-drop. It’s maximizing effectiveness and reducing the amount of hardware, power consumption and service costs of having that IT equipment there.”

Air New Zealand launched five self-bag-drop stations featuring biometric technology at Auckland International Airport in December, with a further eight planned to be installed early this year. The airline says these new bag-drops will speed up the check-in process for its passengers. They also complement the online and self-service kiosk check-in options, enabling its customers to take control of their check-in experience.

The biometric technology incorporated into the bag-drops is similar to that used by SmartGate passport control facilities deployed in New Zealand and Australia. Customers scan their passports and boarding passes to have their identities verified by a biometric camera before being invited to place their bags on the scale to be weighed and then sent to the airline’s baggage handling system.



Air New Zealand Group General Manager Airports John Whittaker said: "We can now streamline the check-in process for our customers at Auckland International Airport and provide a more seamless airport journey. It will reduce the time it takes for our customers to check in and free up our airport team to interact with customers and support them through the self-service process should they require assistance."

This year, Lufthansa is planning to simplify self bag-drop for customers at its German hub airports who arrive with pre-tagged bags, either home-printed tags or using the Rimowa digital tag. A combination of "touchless" bag-drop and the Lufthansa mobile app will do most of the work, with minimal interaction from the passenger. Speaking to Future Travel Experience in January, **Dr. Björn Becker, Lufthansa's Director Product Management, Airport & Passenger Services**, explained that when the bag is placed on the bag-drop, the machine will automatically weigh, identify and match the bag to the passenger name record (PNR). If everything is correct, the passenger will automatically receive a mobile baggage receipt via the Lufthansa app.

"Most of the steps you have to process today will be eliminated – you just place your bag on the machine and everything else is done automatically based on radio frequency identification, barcodes and the information on your pre-filled bag-tag. Compared to classic bag-drop machines you can reduce the necessary process steps from the passenger to nearly zero," said Becker. ²⁰

However bag-drop and other self-service baggage initiatives are not just about the equipment; having the proper business and operational processes and a flexible IT system are critical to success. The issue is complicated by the fact that some airline background systems, such as reservations or departure control, are legacy, possibly in excess of 30 years old. As Rico Barandun noted, "new technology meeting old technology is not always easy."

He cautioned that focusing on IT alone is not enough; business processes must also be changed. "Not everyone gets it right today and a lot of work is required for airlines and airports to understand that it's not technology, it's the business process. It is about changing the process and being flexible and open to changing the processes."

He added: "The challenge is to ask ourselves what do we need? What should processes look like in the future? What do we need to change in the process and how can technology help us?"

"My advice – it is better not to provide self-service at all, than to provide it just for the sake of it and see passengers fail. The success of self-service is not about technology, but about airports and airlines making sure that the process is right and passengers get and identify the benefit. If with self-service bag-drop you spend the same half hour in the queue that you did with agent check-in before, people will ask 'what's the benefit?'"

In April, London's Gatwick Airport will implement phase two of its £36 million transformation of the North Terminal check-in area, opening another 20 self bag-drop units, in addition to the 28 opened last October for phase one, to create the world's largest self-service bag-drop. "The new North Terminal self-service check-in area will increase peak check-in capacity from 3,000 to 4,350 passengers per hour when fully operational. By which time there will also be improved system resilience in terms of power, networks and routing within the North Terminal check-in and baggage system design," said **Matt Payne, Baggage Operational Assurance Manager, Gatwick Airport**.





TECHNOLOGY THAT SUITS PASSENGERS' PREFERENCES

"Gatwick is committed to ensuring passengers have the right baggage service for their individual needs with an ambition to eliminate queues. Some passengers prefer self-service check-in, while others prefer the more traditional check-in experience. Ultimately the process needs to be as efficient as possible, reducing transaction times and enabling passengers to check-in when they want with the least amount of fuss.

Gatwick will soon have the largest self-service bag-drop installation in the world. Based in the North Terminal, this brand new facility will enable passengers to check-in at one of 48 self-service kiosks. In addition, later this year Gatwick will commence with the development of a brand new early bag store facility in the South Terminal. This will enable South Terminal passengers to check-in up to 18 hours in advance of their flight, reducing the reliance on traditional check-in opening times, reducing queues and improving operational efficiencies for Gatwick's airlines.

We are evolving technology that enables passengers to arrive when they choose, check-in how they prefer, then relax and enjoy the world-class retail, restaurant and hotel amenities Gatwick has to offer in advance of their planned departure. With new baggage halls in both locations, handlers and airlines can feel assured bags will be delivered efficiently to optimize handling costs and infrastructure.

The major changes have been with airlines and ground handlers, adapting and integrating their systems and processes to accommodate more automated practices. In addition, Gatwick has updated and improved its baggage handling and check-in desk/systems, ensuring additional checks and balances have been conducted prior to accepting and dispatching bags into the system.

Like any new technology, passengers need time to adjust, but with the introduction of more and more self-service solutions, passengers are becoming far more used to navigating their way around the processes and requirements necessary to check themselves in."

Matt Payne, Baggage Operational Assurance Manager, Gatwick Airport


TRACKING INITIATIVES SET TO IMPROVE BAG HANDLING PERFORMANCE

Bag tracking will be in the spotlight over the next three years as airlines work to ensure they can track each bag throughout its entire journey in readiness for the implementation of IATA's Resolution 753. This will require them, by June 2018, to be able to track a bag onto the aircraft, into arrivals or transfer areas and share this tracking information with the next handling agent (airline, ground handler or airport) in the journey.

As a result, there will be much closer monitoring of inbound (arrival/transfer) bags; and a major focus on exchanging bag information, not just among industry stakeholders but also

to passengers, which will go some way to relieving the stress many passengers feel while waiting for their luggage at the bag carousel.

As well as IATA driving change, there are other pressures on the air transport community to improve baggage performance. In the USA, the Aviation Innovation, Reform, and Reauthorization (AIRR) Bill to re-authorize the funding of the Federal Aviation Administration also includes a proposal that would allow passengers on domestic flights to recoup their checked baggage fees if the airline does not deliver their luggage within 24 hours from the time of the flight's arrival at the destination where they were due to retrieve their checked baggage.



However, IATA has concerns that this target time frame may be too tight. “Given that passengers often change their intended destination during disruptions; and that bags may take a different route to the same place, 24 hours is an optimistic target,” said **Andrew Price, Head of Airport Operations Management**. “WorldTracer holds the majority of the world’s mishandled baggage files, and it is essential that a proactive approach is taken to raising a tracing file for bags that fail to arrive at their destination on the intended flight, so that bags can be located and returned with the minimum of delay.”

IATA is expecting Resolution 753 to have a major impact on bag handling performance. “From 2018, with the introduction of industry-wide baggage tracking through Resolution 753, we are expecting to have a reduction in the number of bags that actually need tracing, because the numbers of bags mishandled should reduce,” said Price.

“Resolution 753 applies to airlines only, but the implementation can also be an airport issue. It would be foolish to have every airline at a busy airport each introducing their own tracking solutions, when the places being tracked are often common use. There are other situations of course, single occupancy terminals for instance are not likely to be using a shared infrastructure approach.”

To smooth Resolution 753 implementation, IATA’s Baggage Working Sub Group on Tracking and Tracing is developing a guide that will drive a common industry approach to collecting, storing and sharing the tracking information for baggage. The implementation guide is expected to be presented to the Baggage Working Group for approval and will be freely available to the industry, most likely from August 2016.

Several major airline and airport bag-tracking initiatives were launched in 2015 to address the requirements of Resolution 753. In May, Etihad Airways selected SITA BagJourney technology to give the airline’s crew and airport staff access to the latest bag-tracking information via a web application. Today the focus is on providing the information to operational staff, but in future the airline could also extend this service to its guests to follow the progress of their own bag via a smartphone app.

“We are always looking for ways to improve the guest experience, and we know that delayed luggage is a major pain point. With SITA’s BagJourney, we can follow guests’ bags through every stage of their travels, which helps reduce mishandling and delays. We can also provide the latest baggage tracking information to crew while they are on the move via CrewTablet-our tablet application for crew operations-so we can address any problems more quickly,” said **Robert Webb, Chief Information and Technology Officer, Etihad Airways**.

In the autumn, the Airports Authority of India (AAI) implemented a new baggage management system to proactively monitor the baggage process at Kolkata and Chennai Airports and provide real-time status on baggage. More than 100 handheld devices have been issued to workers at the two airports, allowing them to scan baggage tags anywhere and provide information on the location of each and every bag.

SITA’s BagManager system will help AAI to determine which passengers have boarded and which bags have been loaded, producing reports to highlight mismatches that are critical to security and in line with international guidelines. The system will enable problems to be identified and resolved before a flight departs. It will also improve operational decision making through the provision of real-time information on the mobile devices used by staff.

AAI Executive Director (IT, FIU and RCDU), Ravi Prakash, said: “Every passenger expects their luggage to arrive with them at their destination, but sometimes weather, or other adverse conditions, can mean that bags don’t make flight connections. The implementation of SITA’s baggage technology will minimize disruption and provide better service to passengers.

“Kolkata and Chennai are the first of 38 airports where this world-class baggage reconciliation system has been implemented. This is part of a strategic partnership with SITA to implement state-of-the-art information and communications technology solutions at airports to cope with the growth of passenger traffic in India, which is expected to be the third-largest aviation market by 2023.”



Latin America's largest airline group, LATAM Airlines Group, which handles in excess of 30 million bags per year, is introducing a new baggage system that will provide real-time status reports on passengers' baggage in 13 airports by the end of 2016. In the first phase of the roll-out, the BagManager technology is being introduced to the group's home market hubs and key international bases in seven countries, beginning with Santiago's Comodoro Arturo Merino Benítez International Airport. The baggage teams across these airports will be equipped with 350 handheld devices to monitor the loading, tracking, tracing, reconciliation and management of baggage, making it possible to track bags no matter where they are in their journey.

Pablo Navarrete, Senior Airport Director, LATAM Airlines Group, said: "For passengers, it is a given that we will deliver their baggage on time at their destination. With a growing network of airports across multiple countries, the ability to access real-time data on such a vital element of the travel experience gives us peace of mind that we will always have full visibility of our passengers' baggage and are able to act proactively before a bag is mishandled."



DELIVERING TRANSPARENT BAGGAGE INFORMATION IN REAL-TIME

"Our vision is to closely monitor and track each phase of the baggage handling process, from beginning to end. Using the BagManager technology, we can provide passengers with real-time information, which is especially important if we need to alert them about any type of service disruption and proactively propose alternative solutions. For example, in the event of delays or cancellations, it will be possible to re-direct passengers' bags according to their needs – meaning we could return their luggage or send it straight to their chosen alternative flight. The ultimate goal is to give passengers direct access to the same baggage handling information.

We also have high expectations for how the new system will help us prevent mishandled luggage. New tracking points will be introduced at check-in, the bag room, plane-side for departures and in the baggage claim area for arrivals in our main airports and hubs – giving us greater visibility and reducing the chances of bags being mishandled.

The introduction of this technology is an important step towards the fulfillment of IATA's Resolution 753 requirements. We will continue to work alongside airports and other airlines to fully implement these standards across our network by 2018."

**Pablo Navarrete, Senior Airport Director,
LATAM Airlines Group**





Today, a handful of airlines enable their passengers to track their luggage like a parcel. However, it is inevitable, given the industry's focus on tracking, that more initiatives will come down the line over the next three years. On the airline front in 2015, American Airlines quietly enabled its passengers to track their bags from check-in to touchdown in real-time via its 'Track Your Bags' page on its website. The autumn saw AA complete its merger with US Airways, which launched its own 'Track Your Bags' services in 2013. By October AA noted that it had expanded bag tracking technology to the whole airline.

However communications and GPS specialists may soon be providing consumers with airline-independent luggage tracking services. For example in September, luggage company Tumi announced it is collaborating with AT&T and LugTrack to launch a wireless tracking device designed to provide travelers with real-time data regarding the location of their luggage.

From March 2016, Lufthansa passengers flying from Frankfurt, Munich, Stuttgart, and Milan can use a link on their mobile boarding pass in the Lufthansa app to track their bags. On arrival at the destination airport, the app will tell them which baggage carousel their bags will arrive on and, from June, the exact time of delivery. If their luggage has not come on the same flight, passengers will receive a notification and can quickly and easily send a forwarding order via a link in the app. The airline will be gradually extending this service to include other airports.

At the same time, Lufthansa is speeding up the repatriation of delayed or mishandled bags to passengers, with the launch of next-generation WorldTracer technology, jointly developed with SITA. It will be available to all agents in the Lufthansa group this year, providing them with access to a new, user-friendly desktop interface that makes it easy to record delayed baggage and trace the missing bags no matter where in the world they are.

The new interface allows ground handlers, airport operators and airlines to access WorldTracer's global baggage data while integrating it with their own reservation or operations systems, providing a rich data set that helps quickly trace a missing bag. **Guenter Friedrich, Vice President Commercial & Passenger, at Lufthansa** said: "Every passenger wants their bag to arrive at their destination and Lufthansa strives to ensure that each passenger is reunited with their baggage at the end of their journey. However, in those rare situations where baggage is delayed, this new, user-friendly version of WorldTracer makes it possible for agents to quickly trace a bag and return it to its owner. This will have a powerful impact on customer satisfaction."

While the development of this new WorldTracer application was funded by Lufthansa and SITA, it will also be made available to the broader air transport community as part of SITA's ongoing investment in WorldTracer.

Another perspective on tracking can be gained from looking at the issues faced by a related sector – air cargo – where there is a huge variety of cargo being carried, and some consignments require higher levels of visibility throughout their journey. Nevertheless, just like the passenger sector, air cargo is evolving more effective tracking and also requires strong collaborative relationships between stakeholders and data sharing to ensure consignments are delivered to the right place, at the right time.





INSIGHTS FROM THE CARGO SECTOR

“By and large, baggage fits a uniform size and shape; air cargo does not. Air cargo can range from thousands of 4kg boxes of fruit and vegetables to oil drilling equipment weighing tens of tonnes each; from race horses to tropical fish. All have their own levels of tracking needs and correct identification.

There is only limited end-to-end tracking right now. Mostly, air cargo tracking (and tracing) is still at an air waybill (the consignment note issued by the airline) level of detail; rather than house waybill (which is issued by the freight forwarder on receiving goods from the shipper) or at an individual piece level.

Traditionally, information about a consignment's transportation status has been in the carriers' domain and typically, they use electronic data interchanges (EDI) based on standards in IATA Cargo Interchange Message Procedures (CargoIMP) to notify the forwarder. Also there are publicly available track-and-trace websites, more often provided by the airline, for the air waybill status to be requested and a response returned via the website.

Shippers are increasingly asking for higher levels of visibility, which will change the levels of technology and capabilities routinely available from carriers. There has been a renewed drive to manage freight at a piece level, partly driven by the need to increase visibility in the supply chain, but also to better serve the interests of security.

There is also increased demand to support time and temperature sensitive cargo and provide information not only about where a piece is or has been, but also what has happened to it. To meet the demands from the pharmaceutical market, some forwarders and carriers are offering specialized tracking with temperature sensitive monitoring from data loggers.

More effective tracking and control of freight managed at the airport is also evolving with the use of radio frequency identification (RFID), which offers more detailed and

precise levels of freight tracking in handling warehouses that traditionally have utilized linear bar codes on freight packages aligned with IATA 606 bar-code label standards.

It is essential for the air logistics to share information. It is the cornerstone of digitizing the supply chain which is continuing to evolve. Sharing data between carriers and all other stakeholders of the air cargo industry (shippers, forwarders, handlers, customs) will reduce the amount of repeat data entry needed, reduce the risks for errors and increase efficiencies, a pre-requisite to meet the sometimes challenging deadlines in airfreight. Furthermore, data transparency will also help maintain safe and secure global supply chains. Without efficient and effective data sharing along the entire air cargo logistics chain, the value proposition of air cargo (time / speed) over other forms of transport is eliminated. Now, no single party can fully operate without some levels of collaboration.

Are there experiences that may be valuable for airlines implementing baggage tracking? Depending on the technologies used, tracking by specific bag might stop when the bag is associated with a unit load device (ULD), i.e. it is loaded into a container when transported on containerized aircraft. Instead there would be an association with the bag and the ULD it was loaded on, as bags could be transported across multiple flights in the same container.

This is a very common scenario for cargo and mail, in particular that mail is loaded in a container which is itself tracked – individual bags might be taken out or added to the container, so long as the complete contents are known. Other variations might include where loose bags are loaded on to a tow-cart and driven out to the ramp then loose loaded into the aircraft. One might track the bags being loaded in to the cart, and then track the cart as it moves from the terminal to the ramp, then unloading of the bags as they are loaded – recording the hold / compartment they are loaded in.”

Steve Hill, Principal Industry Consultant at CHAMP Cargosystems



INVESTING IN BAGGAGE SYSTEMS

As passenger demand for air travel grows, airports are looking for ways to improve their baggage handling efficiency and increase capacity. The behind-the-scenes focus in 2015 and into 2016 has been on system investments that will keep them prepared for future demand.

For example, in Europe Aéroports de Lyon is preparing for both traffic growth and improvements in service by working to double the size of the terminals at Lyons Saint-Exupéry Airport. The plans will include a new baggage handling system in the Future Terminal 1, creating improved operational efficiencies for all stakeholders – airlines, baggage handlers and ground assistance. The majority of the system will be installed in the first phase in 2016, including check-in, screening and automated baggage sorting to departure carousels, as well as arrival carousels in the Future Terminal 1. Phase 2 will get underway in 2017 and will include installing additional check-in counters linked to the baggage sorting system at the New Terminal; plus the installation of a high-speed cross-belt automated sorter.

At the heart of Munich Airport's Terminal 2 and the new satellite terminal opening this spring will be an extended and modernized baggage handling system, which will increase the sorting capacity by a third to 17,800 bags per hour. The new system also includes an early bag store for over 1,000 bags, two additional baggage carousels in the arrivals area and four extra carousels in the sorting area. It is designed to support the airport's increased capacity from 40 million passengers per year in 2014 to 51 million with the opening of the satellite terminal, while maintaining the airport's focus on passenger convenience.

"With our satellite we offer passengers an optimum infrastructure and a unique ambiance", explained **Marco Butz, Manager Processes and Central Infrastructure of the Terminal 2 operating company**. "The baggage handling system plays a major part in enhancing passenger convenience. We maintain the minimum connecting time of 40 minutes between flights – this ensures Munich's place among the world's leading international airports."

In China, around 38 million passengers passed through Hongqiao Airport in 2014, making it the most important domestic airport in Shanghai. The airport is currently modernizing and expanding the Terminal 1 baggage handling system to further expand its capacity and improve the passenger offering. A state-of-the-art baggage handling system in Terminal 1 will include 87 check-in desks, nine carousels in the arrivals area, and seven carousels in the baggage make-up area, where the baggage is prepared for flights, with work scheduled for completion in the summer of 2019.

Shanghai Airport Authority Group vice general manager Dai Xiao Jian noted that during the first half of 2015, the two Shanghai airports overtook Beijing as China's largest aviation hub for the first time. "The modernization of the baggage handling system will make a decisive contribution towards establishing and further extending this position," he said.

In the Middle East, Abu Dhabi Airports is upgrading the baggage handling system at Abu Dhabi International to increase its capacity and ensure it has the infrastructure to meet expected passenger growth. New baggage conveyor lines will be installed in Terminal 1, along with a fully automated hold baggage screening system and explosive trace detection equipment. Upgrades to Terminal 3 will include doubling of check-in capacity and expansion of the baggage sorting areas.

Chief Operations Officer at Abu Dhabi Airports, Ahmad Al Haddabi said: "Abu Dhabi Airports has been closely monitoring passenger growth at Abu Dhabi International Airport and implementing development plans that will cater for the increase in traffic. The upgrade to the baggage handling system is another key initiative being completed to ensure efficient flight operations and convenient passenger experience."

COLLABORATION

TACKLING INCREASING DEMANDS ON CAPACITY

“2016 has started well. The continued rise in passenger traffic has brought a corresponding rise in the numbers of bags handled. As a result, airports and airlines are looking at innovative ways to manage baggage flows. The common theme to this activity is proactive management of the baggage environment. Whether it is through a common airport Ground Operations Manual, based upon the IATA Ground Operations Manual, or through sophisticated reporting, management is taking a close interest in ensuring that the baggage infrastructure is being used as efficiently as possible.

Capacity at airports is a growing issue. The most common issue we are seeing today is airports suffering capacity issues in their baggage halls. Systems are operating at near, or even above, design peak and only a thorough and complete understanding of the baggage flows at the airport is able to contribute to successful operations.

This demand also has an unwanted side effect in that when things do go wrong, it is harder to find time to recover. Stealing from the maintenance window to process thousands of left-behind bags from a single outage is not even a short-term operational strategy.

Baggage capabilities remain quite different across the industry. Given the growing pressure on capacity, the industry can count itself very fortunate to have a reduced mishandling figure for 2015. This is due to the hard work of the many thousands of people involved in making sure that baggage is processed quickly, efficiently and accurately each day.

One frustration that we often hear from these people is that they find it very hard to work across multiple airlines and airports. There is no real consistency in the capabilities of airlines to provide information to each other.

IATA has identified a number of areas that can be considered as common capabilities that all airlines should have. These common areas are being developed into both resolutions and implementation guidance so that the industry is able to develop them in a relatively short period of time.

The full program of work is under development in IATA, and Resolution 753 on baggage tracking is the first example of these efforts. Others are likely to include the use of a Globally Unique Identification for each bag, in addition to the standard license plate; and the ability to quickly and easily share internal tracking data between airlines at a higher resolution of detail when bags deviate from their intended routing.

We also believe it may be time to examine how we are counting bags and reporting on industry performance. Today we use a metric of bags per 1000 customers, but this means that trends such as increased cabin baggage carriage can skew the figures to mask poor performance. We are now looking at how we can create a single common metric that allows easy reporting across the industry, as well as insightful metrics to be applied to individual operations.”

**Andrew Price, Head of Airport Operations Management,
International Air Transport Association**





INTEGRATING INFORMATION FOR BETTER BAGGAGE SERVICES

"In 2016 our goal is to increase collaboration with the International Air Transport Association (IATA) on the end-to-end baggage process. The two organizations are currently discussing how we can better integrate our various initiatives to achieve joint recommended practices for baggage.

The idea is to integrate information so that passengers who want this information can get what best fits their needs, whether it be from the airline or the airport. And rather than looking at specific isolated processes, we want to work jointly with IATA and other industry players on the global end-to-end process.

We also feel it is very important to involve more state organizations in such initiatives to make processes and connections much more efficient.

With growing passenger numbers, we have to find opportunities to utilize technology and improve the end-to-end baggage process. Permanent tags, electronic bag-tags, baggage tracking tools and two-way communication between passengers and airports, airlines and states are just a few of the things upon which we are focusing.

For example, how can we use integrated information to avoid passengers having to provide the same information four or five times at various touch points? Another issue is baggage screening: in some places bags can connect straight through; in others we have to re-screen; and in some countries bags have to be recovered by the passenger so they can go through a secondary search if required. We feel that with data and information sharing, as well as increased involvement and collaboration on the part of all parties involved, these processes can be significantly improved for all entities.

This holistic approach will ultimately extend to looking at how baggage services can better integrate with other services at the airport. We are seeing the introduction of automatic border controls to help accelerate what can at times be a long process to enter a country. But while the border process may be accelerated, customers may still have a long wait to receive their bags, so airports and airlines are now jointly thinking about how the aircraft offload and baggage delivery processes can be performed as efficiently as possible. Currently, this is still a very manual process in most airports. This is something that will be changing in the future given that this is an area of mutual focus for ACI and IATA."

Antoine Rostworowski, Director, Airport Customer Experience and Technology, Airports Council International – World

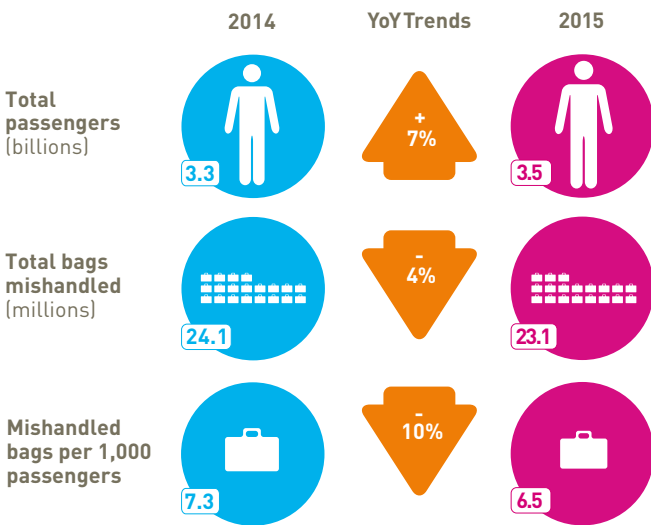
2015 BAG HANDLING PERFORMANCE IN DEPTH

THE GLOBAL PERSPECTIVE

The vast majority of bags are successfully delivered back to passengers at the end of their journey, due largely to the increasing effectiveness of technology aiding baggage management efficiency, despite the continued increase in passenger numbers.

Of the decreasing number of mishandled bags, looking at the detailed performance in 2015, delayed bags accounted for 79% of all mishandled bags; damaged or pilfered bags represented 15%; and lost or stolen bags comprised 6%. The average time it took to reunite passengers with their bags and close the mishandled bag file was 1.76 days.

2015 DELAYED, DAMAGED OR LOST BAGS



Source: SITA

To place bag mishandling trends in a broader framework, the 2015 bag mishandling cost of \$0.65 per passenger represents 0.35% of the airline industry's \$185 operating cost per passenger. Nevertheless, with the industry working on an average operating profit of \$15.5 per passenger, it is clear that the ability to curb its expenditure on mishandled bags will have a positive impact on profits.²¹

The strong demand for air travel in 2015, combined with lower oil prices, efficiency gains and better than expected performance in key economies (for example, a faster than expected recovery in the Eurozone), has ensured the airline industry will deliver a solid financial and operational performance in 2015 according to IATA, which is forecasting a net profit of \$33 billion for the year. IATA is also predicting that airlines will continue to improve their profitability into 2016, with net profit increasing to \$36.3 billion, thanks to a 6.9% increase in demand for passenger travel, with 3.78 billion passengers expected to travel in 2016.²²

However, expectations are building that the industry is nearing the top of the business cycle: "The industry's profitability is better described as 'fragile' than 'sustainable'," said **Tony Tyler, IATA's Director General and CEO**, when the organization announced its outlook for 2016 in December.

The upshot is that the air transport industry cannot afford to let up its effort and investment to tackle bag mishandling. The positive impact made by improving baggage handling is neatly illustrated by calculating what performance in 2015 would have looked like if the mishandling rate had remained unchanged from its 2007 peak of 18.8 bags per 1,000 passengers.

-49% REDUCED COST FOR EACH MISHANDLED BAG PER PASSENGER



Source: SITA

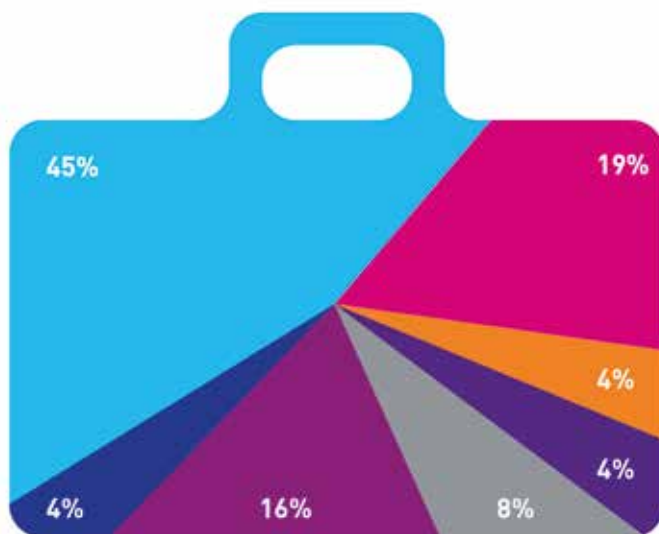


In this scenario, the total number of mishandled bags would have more than doubled to 62.8 million. Furthermore the cost to the industry would have been \$6.2 billion. This demonstrates that over the eight year period 2008-2015, the investments to improve baggage handling performance have saved the air transport industry \$22 billion.

US\$22BN TOTAL MISHANDLED BAG COST SAVINGS SINCE 2007

Although there have been individual peaks and troughs in bag handling performance since SITA began reporting the trends in 2003, the long-term improvements are considerable. In those 13 years, passenger numbers have almost doubled, but the mishandling rate has halved from 13.2 bags per 1,000 passengers to 6.5 in 2015.

REASONS FOR DELAYED BAGS IN 2015



-  Transfer mishandling
-  Failure to load
-  Loading error
-  Arrival mishandling
-  Airport/Customs/Weather/Space-weight restriction
-  Ticketing error/Bag switch/Security/Other
-  Tagging error

REASONS FOR DELAYED BAGS IN 2015

Efforts to improve transfer bag mishandling, when passengers and their luggage are moving from one aircraft to another or from one carrier to another, are paying off, despite the potential complexity of such transfers for passengers. While transfer bags continue to comprise the majority of all delayed bags, the percentage has fallen to 45%, down from 49% in 2014. In real terms 8.43 million bags were delayed during transfer in 2015.

Loading/offloading errors improved slightly, accounting for 4% of delayed bags (6% in 2014). However ticketing errors, bag switches, security issues and other problems accounted for 19% of delayed bags (up from 15% in 2014).

Keeping pretty much in line with performance in 2014, failure to load accounted for 16% of delayed bags; airport/customer/weather/space-weight restrictions represented 8%; tagging errors and failures to load 4%; and arrival station mishandling 4%.

IMPROVING LONG-TERM REGIONAL TRENDS



Sources for Europe data: 2007-2013 Association of European Airlines / 2014-2015 SITA

REGIONAL PERSPECTIVES

Airlines in Europe achieved the greatest improvement in the baggage mishandling rate in 2015, with a 21% reduction to 7.80 bags per thousand passengers in 2015, although carriers in the region still lag behind the industry trend.

In the USA, airlines achieved a 10% improvement in the mishandling rate for domestic flights – down to 3.24 bags per thousand passengers, which is comfortably below the global average.

Another insight into the 2015 performance is offered by Airlines for America (A4A), which reported that the overwhelming majority of hold baggage was properly handled. “Baggage handling performance improved yet again in 2015, as 99.68% of passengers had their checked bags properly handled – up from 99.64% in 2014 – largely thanks to continued airline investments in ground equipment, bag carousels, IT systems and staffing. US airlines expect to make further progress on this front in 2016,” said **John Heimlich, Vice President and Chief Economist, A4A**.

The mishandling rate among airlines in Asia Pacific increased by 8% last year to 2.02 bags per thousand passengers. Despite this setback, carriers in Asia Pacific continue to outperform those in other regions. “Asia Pacific is now well established

as the global air transport industry’s largest market, accounting for a quarter of global passenger traffic. Overall, the region’s mishandling baggage rates remain well below the global average,” said **Beatrice Lim, Director – Industry and Regulatory Affairs, Association for Asia Pacific Airlines**.

INVESTING IN BAG TECHNOLOGY

“Strong growth in passenger demand over the past year led to increased congestion in major airports, contributing to the decline in the region’s baggage mishandling rates. Expansion efforts for selected airports had generally not kept pace with the robust growth in passenger markets, thus adversely affecting airport operational efficiency.

With a view to improving baggage handling rates, airports within the region have continued to invest in improved technology and innovation in baggage handling systems, such as biometric-enabled self-service bag-drop and electronic bag-tags.”

Beatrice Lim, Director – Industry and Regulatory Affairs, Association of Asia Pacific Airlines



FOCUSING ON BAGGAGE INNOVATION

“2015 saw an increased industry focus on baggage innovation such as scanning and enhanced sortation systems as airlines and airports begin moving towards achieving compliance with the A4A/IATA Baggage Tracking Resolution, which becomes effective in 2018. Discussions relative to implementation of this Resolution are sure to stay at the forefront with baggage experts as the industry continues to develop solutions.

Electronic baggage tags are still moving forward, although initial expectations for adoption and integration into standard operations were delayed as airlines continue to test available hardware and push for technology that provides the capability for global implementation. The current focus for these tags is to develop solutions for interoperability and define procedures for acceptance, particularly in the event of an interline journey. In the meantime, the implementation of home-printed baggage tags has advanced because of the relatively low-technical development required and the benefit of pushing the baggage tag printing and attachment to the bag offsite, which reduces passenger queues and check-in time at the airport.”

Stephanie Taylor, Director, Passenger Services, Airlines for America (A4A)

ENHANCING PASSENGER AND CABIN BAGGAGE SCREENING

“To counter the threat from explosive devices being brought on board an aircraft by passengers, the European Union followed the United States in the implementation of Explosive Trace Detection (ETD) for cabin baggage and passenger screening. The requirements for baggage came into force on 1 March 2015 and for passengers on 1 September 2015.

The Association of European Airlines is pleased with the consultation phase, which took place between the European Commission, Member States, airlines and other stakeholders and the co-operation throughout the subsequent implementation.

Since the introduction, half of the European airports questioned reported an initial reduction of 5-20% in security checkpoint throughput related to the introduction of ETD; the remainder reported no impact. Inevitably there were some teething problems for airlines as well, but overall, airlines are positive: while increasing the security level, efficiency at the checkpoint as well as passenger throughput has been restored.”

Sue Lockey, General Manager Research, Association of European Airlines

NOTES AND REFERENCES

1. IATA Economic Performance of the Airline Industry, Industry Forecast, issued December 2015: 3.54 billion passengers are forecast for 2015, a 6.55% increase on 3.27 billion in 2014.

2. IATA Air Passenger Forecast Shows Dip | Long-Term Demand, press release issued 26 November 2015

3. Passenger IT Trend Survey 2015: 19% of passengers take carry-on bags only; 81% check in one or more bags. 89% of passengers felt positive emotions at bag-tag and 79% felt positive emotions at bag-drop.

4. Passenger IT: 64% of passengers used an airline check-in counter to drop off their luggage; 16% used a staffed bag-drop and 4% used an unstaffed bag-drop (16% no response).

5. Passenger IT: 77% felt positive emotions at staffed bag-drops, whereas 59% felt positive at the fully self-service stations.

6. Passenger IT: 31% of passengers expect to be using either a staffed bag-drop station (23%) or an unstaffed, fully self-service bag-drop (8%) on their next flight in 2016; 59% expect to be using an airline check-in counter.

7. Passenger IT: 92% of Mexican passengers checked in bags; in 2015, 24% used self bag-drops with staff support and 34% expect to use them this year. More passengers check-in their bags at airports in Brazil than in other parts of the world. In 2015, 17% of Brazilian air passengers used self bag-drop services, but this is set to grow to 35% over 2016.

8. Passenger IT: 62% of American passengers checked their baggage at an airport counter in 2015; one in five used off-airport baggage drop; and another 19% used self-service bag-drop at the airport.

9. Towards a Mobile Optimized Journey in China, published 10 March 2016: 59% of passengers said they would prefer to use personal technologies to check-in for their next flight if available; 73% of passengers deposited their luggage at an airport counter on their last trip; and 28% of passengers would use bag-drop facilities on their next flight, if available.

10. Passenger IT: 43% of passengers waited less than 10 minutes to collect their bags; 45% waited 10-30 minutes; 10% waited less than an hour; and 2% waited over an hour.

11. Passenger IT: At bag collection, 69% of passengers feel positive emotions; while 31% experience negative emotions, only exceeded by the security stage, when 36% of passengers are unhappy.

APPENDIX

WHAT IS A MISHANDLED BAG?

A mishandled bag is a report of a delayed, damaged or pilfered bag which is recorded by either an airline or its handling company on behalf of the passenger and that is handled as a claim.

SCOPE OF THE 2016 BAGGAGE REPORT

SITA's annual baggage report is designed to offer all air transport industry stakeholders the latest facts, figures and trends related to global baggage processing and management. The global data on mishandled bags in 2015 detailed in the report is sourced from SITA's WorldTracer.

It should be noted that 2015 industry data, including passenger numbers, used in this report is drawn from IATA forecasts for the year issued in December 2015.

In preparing this report, SITA works in close collaboration with industry partners to ensure its facts, figures and analysis are as complete and accurate as possible. These essential insights aim to assist air transport industry stakeholders as they work together to improve baggage management around the world, generating savings for the industry while improving the passenger experience.



12. Passenger IT: 96% of passengers are interested in receiving bag collection updates on their mobile device, with 63% saying they would definitely use the service.

13. Airline IT Trends Survey 2015: 36% of airlines have already implemented bag-tag printing, rising to 77% over the next three years.
Airport IT Trends Survey 2015: 42% of airports have implemented bag-tag printing; and this is expected to reach 88% by 2018.

14. Airport IT: 48% of airports offer assisted bag-drops, with implementations expected to rise to 90% in the next three years.

15. Airline IT: 37% of airlines provide assisted bag-drops, rising to 78% by 2018.

16. Airport IT: 18% of airports current provide unassisted bag-drops, but this is set to rise to 72% by 2018.
Airline IT: 17% of airlines already offer unassisted bag-drops, with implementations expected to rise to 74% by 2018.

17. Airport IT: 40% of airports are planning to leverage beacon technology at baggage reclaim by 2018.
Airline IT: 43% of airlines are planning to leverage beacons at baggage reclaim and 40% are planning to use them to send notifications for bag collection in the next three years.

18. Airline IT: Just 2% of airlines currently send baggage location updates to passengers' smartphone apps, but this is expected to increase to 64% by 2018, when 58% will also be sending these updates to passengers' tablet apps.

19. Airline IT: 10% of airlines send missing bag communications to passengers' smartphone apps today and this is set to rise to 70% in the next three years; just 4% already provide this service to passengers' tablet apps, but this is set to increase to 59% in the same period. 11% of airlines have currently enabled the reporting of missing baggage via passengers' smartphone apps and 4% via tablet apps, but this is set to rise to 61% and 50% respectively by 2018.
Airport IT: By 2018, 33% of airports will be offering self-service lost bag registration, up from 9% today.

20. Source: Future Travel Experience, published 14 January 2016; <http://www.futuretravelexperience.com/2016/01/lufthansas-baggage-focused-investment-to-continue-in-2016/>

21. Operating profit per passenger is calculated using IATA's forecast of an industry operating profit of \$55 billion in 2015 in Economic Performance of the Airline Industry, Industry Forecast, issued December 2015.

22. Source: IATA Economic Performance of the Airline Industry, Industry Forecast; and IATA press release, Airlines Continue to Improve Profitability 5.1% Net Profit Margin for 2016, issued 10 December 2015.

SITA AT A GLANCE

SITA transforms air travel through technology - for airlines, at airports and on aircraft.

- Our vision is to be the chosen technology partner of the industry, a position we will attain through flawless customer service and a unique portfolio of IT and communications solutions that covers the industry's every need 24/7.
- We are the innovators of the industry. Our experts and developers keep it fuelled with a constant stream of ground-breaking products and solutions. We are the ones who see the potential in the latest technology and put it to work.
- Our customers include airlines, airports, GDSs and governments. We work with about 400 air transport industry members and 2,800 customers in over 200 countries and territories.
- We are open, energetic and committed. We work in collaboration with our partners and customers to ensure we are always delivering the most effective, most efficient solutions.
- We own and operate the world's most extensive communications network. It's the vital asset that keeps the global air transport industry connected.
- We are 100% owned by the air transport industry – a unique status that enables us to understand and respond to its needs better than anyone.
- Our annual IT surveys for airlines, airports and passenger self-service are industry-renowned and the only ones of their kind.
- We sponsor .aero, the top-level internet domain reserved exclusively for aviation.
- In 2015, we had consolidated revenues of US\$1.7 billion.

For further information, please visit www.sita.aero



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