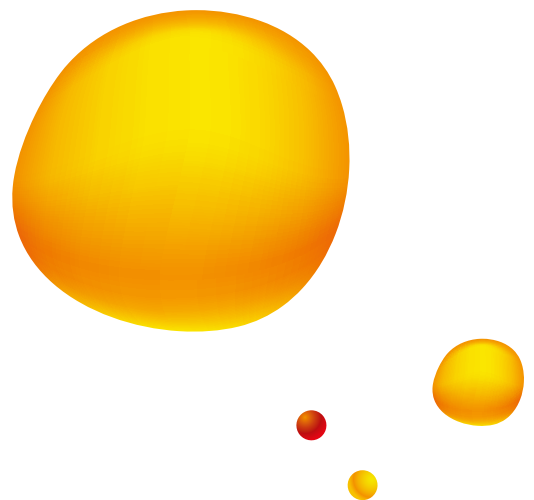




2015

AIR TRANSPORT INDUSTRY INSIGHTS

THE BAGGAGE REPORT



In association with

Air Transport World

SITA

Create success. Together

FOREWORD

People continue to fly in ever increasing numbers. Over the past 11 years that we have been tracking baggage mishandling statistics, the number of passengers has grown by more than 1.41 billion, putting a considerable strain on the industry's baggage system.

It has therefore been a remarkable achievement to cut the baggage mishandling rate by 61.3% from its peak of 18.88 bags per thousand passengers in 2007. During this time the airline industry has saved an estimated US\$18 billion.

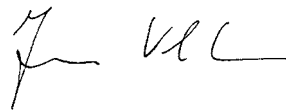
The investment the industry has made in baggage systems automation and processes have made a huge difference to the reliability and speed of baggage delivery, in particular for bags transferring from one flight to another.

For instance, SITA's community baggage systems processes more than 2.5 billion messages annually, helping ensure that bag and passenger travel on the same flight.

Given the success already in bringing down the mishandling rate, driving further incremental improvements is going to be that much harder.

We have already seen the additional pressure in 2014 of record load factors and a 5.4% uplift in the number of passengers nudge the mishandling rate up to 7.30 bags per thousand passengers, from 6.96 the previous year.

It is a reminder to us that we cannot afford to take our foot off the pedal. IATA is forecasting another year of strong passenger growth in 2015 – even higher than in 2014. Just to keep bag mishandling rates in check will require continual investment, collaboration and focus from all industry partners.



Francesco Violante
Chief Executive Officer
SITA

BAGGAGE FACTS AT-A-GLANCE

3.3 BILLION	ENPLANED PASSENGERS IN 2014
7.3	MISHANDLED BAGS PER 1,000 PASSENGERS IN 2014
61.3%	CUT IN MISHANDLED BAGS RATE SINCE 2007
18 US\$ BILLION	GLOBAL SAVINGS SINCE 2007

CONTENTS

KEY TRENDS	4
Overview	4
Airlines and airports are planning more self-service baggage options	4
Passengers want baggage services that give them more control	5
Mishandled bag trends	6
<hr/>	
INNOVATION	9
Overview	9
Bag-tagging moves off-airport	9
Self-service bag-drop pick up the pace	11
Automated systems improving bag delivery and mishandling	12
Bag tracking moves up the agenda	14
Bags in the lab	17
<hr/>	
COLLABORATION	18
Good progress and new baggage initiatives	20
A web service to better serve passengers	20
<hr/>	
APPENDIX	21
What is a mishandled bag?	21
Scope of 2015 Baggage Report	21
<hr/>	
NOTES AND REFERENCES	22



KEY TRENDS

OVERVIEW

The airline and airport community has been rolling out bag-tagging and bag-drop initiatives in 2014 and has plans for major investments to improve baggage processes for passengers as part of its commitment to improving bag handling.

This commitment is underscored by the significant reduction in the rate of baggage mishandling over the long-term. However, while industry initiatives are underway, delivery of improvements is not necessarily consistent worldwide. Furthermore, baggage processes, systems and infrastructure inevitably come under pressure as passenger traffic increases and there is a correlation between 2014's growth in passenger numbers and the level of bag mishandling. Regionally, the greater the growth in passengers, the greater the impact on bag mishandling.

AIRLINES AND AIRPORTS ARE PLANNING MORE SELF-SERVICE BAGGAGE OPTIONS

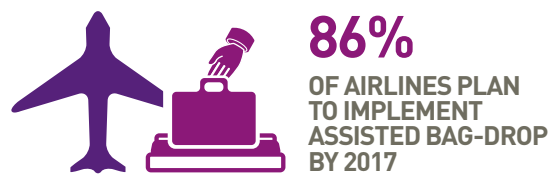
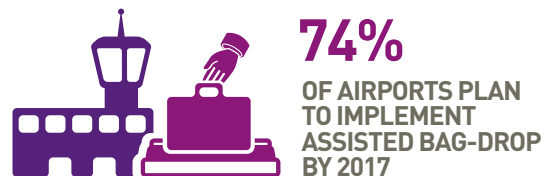
Airlines and airports recognize passengers' desire for more control and are pushing forward with plans for self-service solutions that will allow passengers to process their own bags at the airport.

For airports, baggage processing and management ranked fourth in their top investment priorities last year, according to the 2014 Airport IT Trends Survey² and their number one new service technology investment is self-service processes, such as kiosks and bag-drops. Over the next three years, 59% will be investing in major program and 26% will be financing pilot projects.

Today, about a third of airlines and airports offer their passengers the ability to self-tag their luggage via tags printed at kiosks.³ Although over the next three years, airlines are set to draw ahead according to the 2014 Airline IT Trends Survey, by which time 82% expect to be offering solutions, compared to 69% of airports detailed in the 2014 Airport IT Trends Survey.

Airports currently lead the way with bagdrop solutions: 38% provide assisted bag-drop stations and those implementations are expected to double by the end of 2017.⁴ The increase in fully self-service bag-drops over the same period will be even more rapid, rising from 16% to 62%.

While airlines have been slower off the mark – 33% currently provide assisted bag-drops and 9% offer fully self-service bag-drops – they will overtake airports, with 86% expecting to offer assisted bag-drops and 70% automated bag-drops by the end of 2017⁵.



However, it should be noted that airport investment is dependent on location, i.e. whether the facilities will be common-use (for multiple airlines) or dedicated to one airline. In addition, airports require airlines to be ready with their applications, otherwise the equipment will sit unused.

New mobile services from airlines are being shaped by the rapid adoption of mobile devices and an IATA resolution that its member airlines will track baggage during the journey from 2018. On the operations front, 35% of airlines already provide real-time baggage information to their staff and this is forecast to climb to 79% over the next three years. When it comes to passenger services, airlines have made most progress enabling the payment of bag charges via smartphone apps: 19% have already implemented this functionality, rising to 81% in the next three years.



It is early days for bag-tracking services: only 10% of airlines provide real-time information for passengers today; but a six-fold increase in adoption is planned, to reach 69% by 2017. The growth rate is expected to be even faster for providing bag location updates via smartphone apps. A handful of airlines provide these updates today (5%), but 66% expect to be doing so by 2017.



66%
OF AIRLINES WILL
OFFER BAG LOCATION
UPDATE TO PASSENGERS
VIA MOBILE BY 2017

The air transport sector is also working towards giving passengers more self-service options and involvement if their bags are missing. Airlines are more advanced than airports in providing kiosks where passengers can make a missing bag report: 18% offer this facility compared to 8% of airports. Airlines are likely to maintain their lead over the next three years, by which time 65% are set to provide the service, compared to 34% of airports.

Just over 10% of airlines provide passengers with missing bag information via smartphone apps and enable passengers to make their own missing bag reports via smartphone apps, but two thirds or more expect to be doing so by the end of 2017.⁵

PASSENGERS WANT BAGGAGE SERVICES THAT GIVE THEM MORE CONTROL

Today's passengers are hungry for more autonomy when it comes to processing their luggage and more information about what is happening to their bags on the journey.

Furthermore, there is a contingent of air travelers who are already comfortable with self-processing their bags according to the 2014 Passenger IT Trends Survey. About a quarter or so of passengers either regularly use permanent bag-tags, print their own tag at home or use an airport kiosk.⁶ Around a quarter of today's flyers regularly use fully self-service bag-drops and over two fifths regularly use dedicated staffed bag-drop areas.⁷ However, roughly forty percent of passengers say they would make more uses of some kind of self-tagging method if it was available; and a similar percentage would make more use of both staffed bag-drops and self-service bag-drops.⁸

Mobile devices have become essential travel tools: 97% of passengers bring their own mobile device, mostly smartphones,⁹ when traveling and the majority are therefore looking to airlines and airports to provide new baggage services that will provide them with real-time information about what is happening to their bags.

Two thirds of passengers say they would definitely use this service.¹⁰ If their bags are missing, passengers also want the ability to act immediately and self-process missing bag reports at the airport, either via their smartphones or a kiosk: 62% and 54% respectively would definitely use these services if they were available.

The air transport sector cannot afford to be complacent about the quality of their baggage services. Around a quarter of all passengers say there is room for significant improvement of check-in and baggage drop-off and collecting bags at the destination.¹¹



97%
OF PASSENGERS
CARRY A DEVICE



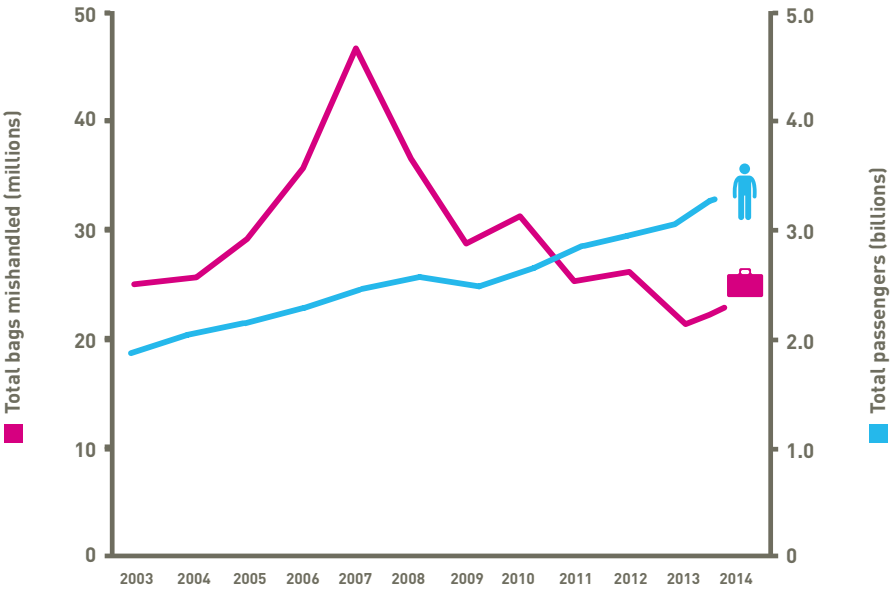
MISHANDLED BAG TRENDS

Over the long-term and against the backdrop of increasing passenger numbers, the industry has achieved a major reduction in the level of bag mishandling since 2007. In this eight year period the total number of mishandled bags fell by 48.5% to 24.1 million in 2014 (down from 46.9 million in 2007). The decrease in the rate of mishandling has been even more dramatic – down 61.3% to 7.3 bags per thousand passengers (compared to 18.9 bags per thousand in 2007). As a result the industry has seen its mishandled bag costs reduce by 43.1%. Include 18 billion total cost.

In the shorter term, 2014 was an expansive year for air travel. Lower oil prices and stronger worldwide GDP growth have been the main drivers for improved overall airline performance, with airlines expected to post a collective global net profit of some US\$19.9 billion according to IATA, which is also forecasting a buoyant 2015, with profits rising to US\$25 billion. (See footnote 1).

Given the overall trend for airlines to increase seating densities in their aircraft¹² as well as the greater capacity of next generation aircraft, it is likely that should a baggage handling problem occur with a flight, more people will be affected. Passenger numbers rose to 3.3 billion in 2014 (up 5.5% from 3.1 in 2013). At the same time aircraft load factors increased globally to 79.7%.¹³ These pressures on infrastructure and processes have therefore pushed up the rate of bag mishandling to 7.3 mishandled bags per thousand passengers. The total number of bags mishandled last year rose to 24.1 million (from 21.8 million in 2013). The overall cost of mishandled bags to the industry was US\$2.4 billion in 2014 (US\$2.09 billion in 2013). Nevertheless, this is a sizable reduction on the US\$4.22 billion mishandling cost racked up in 2007.

Trend of Passengers enplaned and bags mishandled



Source: SITA 2015 Baggage Report

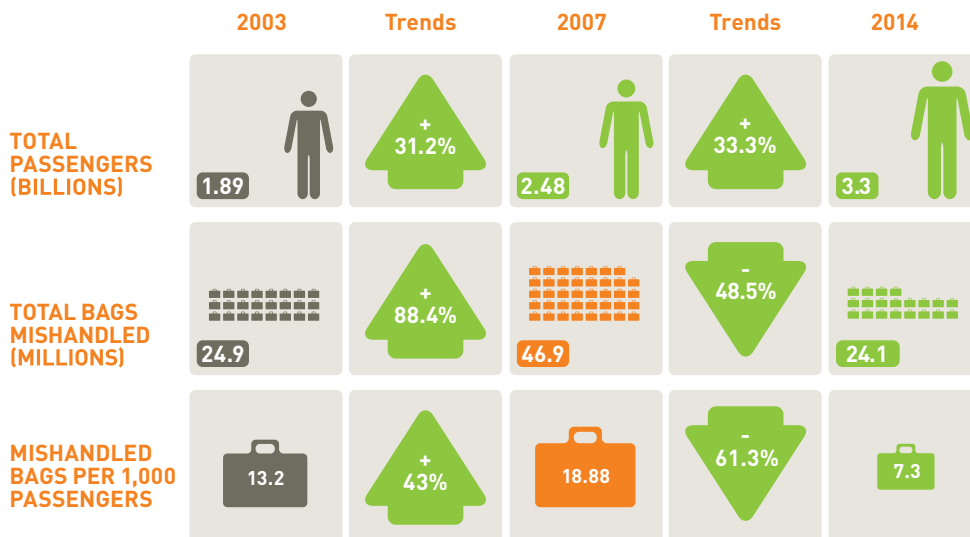
To give the 2014 mishandling cost some additional context, the cost per passenger was US\$0.73, which represents a slim 0.34% of the aviation industry's US\$216 per passenger operating cost (i.e. the expenses of administering the business on a day-to-day basis). Nevertheless, with the industry working on an average profit of US\$11.61 per customer, the ability to reduce bag handling expenditure will have a positive impact on that profit margin.¹⁴

Looking at the detail for 2014: delayed bags comprised 80.2% of mishandled bags (down from 81.3% in 2013); damaged and pilfered bags reduced slightly to account for 14.3% (15.4% in 2013); and lost or stolen bags represented 5.5%. The average time it takes to reunite passengers with their bags and close the mishandled bag file extended to an average of 1.6 days, or about two and a half hours longer than in 2013.

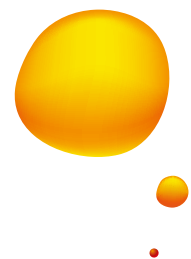
US\$18BN

TOTAL MISHANDLED COST SAVINGS FROM 2007

Long term trends for mishandled bags



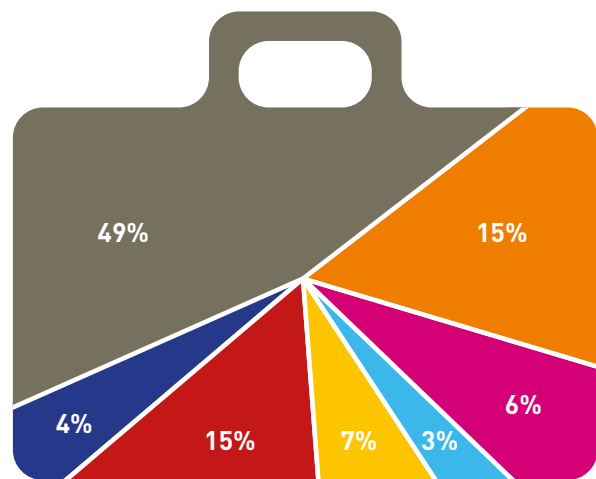
Source: SITA 2015 Baggage Report



Transfer bag mishandling, when passengers and their luggage are moving from one aircraft to another, or from one carrier to another, represented the majority of delayed bags; accounting for 49% of all delayed bags in 2014, up from 45% in 2013. In real terms, 11.81 million transfer bags were delayed in 2014. However the longer-term picture is more optimistic: the industry has almost halved the number of delayed transfer bags compared to 2007 when they also accounted for 49% of all delayed bags. See the Appendix for the full baggage statistics.

Another insight into baggage handling performance in 2014 is offered by, Airlines for America (A4A), which reports that the overwhelming majority of hold baggage was properly handled. "Baggage-handling performance remained high in 2014 despite extremely challenging operating conditions, particularly in the first half of the year. The great news for the traveling public is that more than 99.6% of passengers had their checked bags properly handled, largely thanks to the investments airlines continue to make to ensure bags arrive safely and on time, and to improve baggage handling even further in 2015," said John Heimlich, Vice President and Chief Economist, Airlines for America's.

2014 The reasons for delayed bags



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

Source: SITA 2015 Baggage Report



INNOVATION

OVERVIEW

In 2014, all stages of the bag's journey came under the microscope, with airlines and airports focusing their efforts on driving innovations around tagging luggage and self-service bag-drop solutions. Some airports also made investments into bag system automation. The industry made headway on solutions for both passengers and aviation industry stakeholders to track bags across the entire journey and provide bag data to operations staff, wherever they are in the airport, with concept work undertaken during the year set to roll out in 2015.

BAG-TAGGING MOVES OFF-AIRPORT

While most industry self-tagging initiatives are focused on the airport, a pioneering band of airlines is further streamlining baggage processes, and saving time for passengers, by moving tagging away from the airport to home.

In April 2014, Alaska Airlines became the first US carrier to launch self-bag-tagging from home, initially for passengers traveling non-stop between Seattle and San Diego, Anchorage or Juneau, then extending the initiative to further destinations during the year. Passengers print their bags tags at home as part of the online check-in process. These are inserted into reusable clear plastic envelopes supplied free by the airline. Passengers who elect to use home-printed tags also benefit from a dedicated Self-Tag Express lane when they arrive at the airport. "Our goal is to be the easiest airline to fly. That's why we're introducing additional self-tagging capability so customers who prefer self-service options have the ability to print bag-tags at home during the check-in process," said Curtis Kopf, Alaska Airlines' vice president of customer innovation and alaskaair.com. "Tagging your bags at home can save some time at the airport."

United Airlines has launched a similar print-at-home bag-tagging initiative for customers traveling on selected non-stop flights departing from Boston Logan International Airport. At the bag-drop area in the airport passengers must show a government-issued photo-ID and United has representatives on hand to check the baggage and review the information previously submitted online.

Elsewhere, the year saw European carrier Iberia extend its MyBagTag home printing service to an extra ten destinations in Latin America, Switzerland and connecting flights in Spain.

In the Middle East, Qatar Airways launched My Q-Tag, which allows customers departing from Doha Hamad International Airport to 103 destinations to print their bag-tags online. At the airport passengers take their luggage directly to web check-in bag-drop counters for a customer-service representative to process.

Germany's Lufthansa included a QR code on its HomeTag, which means that travel details can be reconstructed even if the tag has been damaged. In addition the HomeTag holder has a radio frequency identification (RFID) chip to enable passengers to use the express check-in at Lufthansa baggage machines. The RFID chip also contains an extra copy of all the baggage details.



Giving passengers more control

For Lufthansa, HomeTag is another step towards giving passengers more control over their journey. “We think the majority of passengers will use options to enable a journey that is more tailored to their individual needs, like self-service bag-drops, self-labeling, pick-up and delivery services, intelligent tags or luggage,” said Michael Harwerth, Project Manager Passenger Services Interactive Lufthansa. “Our five-year goal is to have HomeTags on at least 60% of all baggage.”

Behind-the-scenes innovations included separating the tagging and bag-drop process within the departure control system and devising security mechanisms to prevent fraud or misuse of HomeTag. “The construction of the HomeTag holders was a challenge, as they have to survive the extreme conditions in baggage transport – i.e. heat, cold, tearing, scratching, kerosene,” added Harwerth.

HomeTag has been launched on flights between Frankfurt and Tokyo-Narita International in Japan. When upcoming changes to European Union customs regulation are implemented, numerous routes within Europe and to and from the Americas will be opened. It is early days for the HomeTag, but Lufthansa is confident there will be benefits for passengers, the airline and its industry partners.

“Passengers will be more able to prepare for their journey in advance, at home, with less stress, giving them more precious time at the airport before departure. Bag-drop times will reduce, as will wait times in the line. On the airline’s side, the main benefit comes from a higher throughput at the bag-drop points, extending the capacity of the existing airport infrastructures. On a side track, read rates have proven to be even better than regular paper tags, thus reducing manual correction efforts,” said Harwerth.

Another approach to moving tagging away from the airport is the growing interest in electronic bag-tags. “In 2014 we saw real development and progress in the area of electronic baggage tags, which many believe will revolutionize the ways in which baggage is accepted, handled, and tracked, providing even more transparency and communication tools between the airlines, passengers, and even the baggage tag itself,” said Stephanie Taylor, Manager Passenger Services, Airlines for America (A4A).

She explained that communication protocols such as near field communication (NFC) and radio frequency identification (RFID), either used independently or in combination with the electronic ink screens, have the capability to provide more accurate and timely updates about a bag’s specific location. Some prototypes can provide exact GPS coordinates, security features to alert the bag owner of possible theft, automatic journey updates on the electronic ink display to reflect itinerary changes, and even provide passenger information to airlines in the event of separation from their bags.

“Both A4A and IATA passed coordinated standards relative to the definition and requirements of electronic baggage tags, and several manufacturers are currently racing to market the first fully airline system compatible version featuring the capability to travel on multi-carrier interline journeys. We anticipate that multiple carriers will have Electronic Baggage Tags manufactured, available, and attached to their passengers’ bags by the end of 2015,” said Taylor.





SELF-SERVICE BAG-DROP PICK UP THE PACE

Projects to extend self-processing to bag-drop are picking up pace around the world. In Europe, Finavia has been piloting self-service bag-drop machines for Norwegian and SAS customers at Helsinki Airport since 2012 with good results. In 2014, the airport operator introduced another ten machines at Helsinki and two at Oulu Airport and is also planning to introduce them at Turku Airport in 2015.

Utilizing technology to make the travel process smoother is a key driver for Finavia. Passengers simply print their bag-tags at the check-in kiosk, attach them to their luggage and at the bag-drop machine, scan the baggage label; and then the bag is transported via the baggage system to the cargo hold, ready for the flight.

Finavia's Director of Helsinki Airport, Ville Haapasari observed: "Self-service, such as bag-drop machines, makes the check-in times of passengers more flexible, evens out the busy periods at the airport, and increases the check-in capacity of terminals. More effectively produced airport services also provide airlines with cost advantages, which are also ultimately the precondition for moderate flight ticket prices."

Elsewhere in Europe, Hamburg airport installed check-in and baggage drop-off kiosks in Terminal 1 for Lufthansa and easyJet passengers, with the aim of extending to other airlines over time. "This enables us to offer our passengers better service thanks to reduced waiting times, shorter walking distances, and ease of orientation," explained Thomas Lueders, Project Leader for Terminal Management.

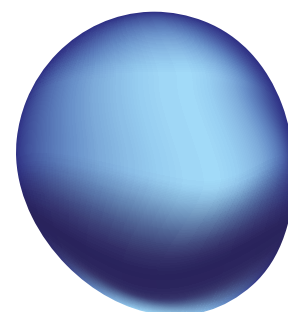
In Canada, Halifax Stanfield International Airport became the first in North America to offer self-service bag-drop for all passengers in 2014, working closely with airline partners, including Air Canada and WestJet, to develop the new passenger process models. Although the bag-drop is fully automated, airline service agents are also on hand to assist if necessary. The airport reports that the self-service bag-drop has reduced queues and cut the average check-in time from ten to just under two minutes.

Engaging with airlines at the design phase has been the key to success according to Bryan Thompson, past General Manager Strategy Planning & Development at Melbourne International Airport, which became the first to offer common-use self-service bag-drops for its international passengers in September 2013. He said that despite some resistance among airlines to come on board because they require certification of the system, he hoped to overcome that reluctance as more people realized the benefits.

More choice for passengers and more flexibility

For Melbourne an important focus has been flexibility and enabling multiple users. Behind the scenes the team spent a lot of time looking at design, functionality and the ability to scale the roll-out when the bag-drop proved itself. An initial trial was successfully completed in 2014 and 12 second-generation automated bag-drop stations are now in place. The next step will be full system integration so that all international passengers have the choice of self-service check-in, after which the airport will look to expand the location of the self-service facilities.

"Our vision for automated baggage and self-service is to give passengers choice. Different passengers have different needs so to provide choices that will meet everyone's needs, we believe our infrastructure needs to be flexible, said Thompson, adding, "There will always be regulatory constraints around the check-in procedure and handling of baggage, which is another reason why we're keeping our infrastructure as flexible as we can to be able to adjust as regulations change."





AUTOMATED SYSTEMS IMPROVING BAG DELIVERY AND MISHANDLING

Innovations to automated systems have underpinned improvements to bag-handling capability, accuracy and speed across 2014. One example was the full integration of SITA's BagManager baggage management and reconciliation system with a special US Customs and Border Protection (CBP) software suite at a Middle East airport, only the second CBP facility globally to do so.

SITA BagManager is connected to 26 touchscreen work stations and 30 image-capture stations, including cameras, weigh scales and bar code readers to provide CBP agents with on-screen images and the weights of passengers' bags as they pass through the pre-clearance facility, allowing them to process passengers and their bags more accurately, quickly and efficiently.

"Pre-clearance facilities like these can also have a big impact on passenger traffic. At Dublin Airport, where we implemented a similar solution, transfer business jumped by 26% in 2013." said Hani El-Assaad, SITA President, Middle East, India and Africa. **"In addition to facilitating the US CBP process, SITA BagManager-CBP solution also helps gate agents and baggage handlers track and monitor baggage and passenger progress in real-time. When they need to offload bags, they can use images to find specific bags more quickly, preventing late departures and the related airport charges. SITA BagManager has also proven to reduce mishandled bags by ten to 20 percent."**

London's Heathrow Airport has been working to improve reliability and punctuality of baggage at the airport with an investment in excess of £400 million into its state-of-the-art Terminal 3 Integrated Baggage (T3IB) system that will bring all Terminal 3's check-in and transfer baggage under one roof and increase the terminal's bag handling capacity from 5,200 to 7,200 bags per hour. A phased implementation begins in March 2015 when live bags will start using the new facility and will continue to May 2016, when T3IB becomes fully operational.

To enable faster and more reliable baggage connections, T3IB utilizes some new processes and technologies, including baggage containers that can be more loaded in advance and more quickly, a process known as "compressed-build"; the introduction of the latest technology Standard 3 hold baggage security screening machine; and the largest bag store at Heathrow, capable of storing 4,800 bags, which will allow airlines to offer their passengers more flexible check-in times.

Doha's new Hamad International Airport has set itself an ambitious goal of exceptional baggage handling, with the shortest possible connection times between flights and no lost baggage.

To help it achieve this goal, an automated baggage handling system has been installed with a processing capacity of 19,500 bags per hour.

The system's two tilt-tray sorting systems, with a total of 28 inductions, 172 chutes and 22 make-up carousels, will ensure, in the event of sorter downtime, that all passenger bags will continue to be processed on schedule, with no delays.

Transferring passengers make up 80% of the airport's traffic, and to further streamline the transfer bag process, there are 1,750 fully automated early bag storage positions located below sorter system loops for efficient and timely release.

These state-of-the-art integrated baggage systems enable efficient collaboration among the key stakeholders, namely Qatar Airways, ground handler Qatar Aviation Services and the Airport.

Hamad International Airport's Chief Operating Officer, Badr Mohammed Al Meer, explained: **"Baggage systems are integrated using IATA messages, equipped with proactive automated checks and are continuously enhanced, thereby improving the communication between the key stakeholders to effectively oversee the baggage operations and to deal with anomalies on a pro-active basis."**

He added: "Such automation contributes to the reduction in the ratio of mishandled bags and improvement of visibility for baggage handling teams, enabling them to focus on value-adding monitoring and proactive corrective processes, thus reducing queues and time at lost-and-found counters."

"Continuous collaboration between stakeholders and integration of departure control systems, baggage handling systems and baggage reconciliation systems, with automated proactive alerts to deal with anomalies helps avoid or reduce the baggage flow to problem chutes, increases baggage systems' up-time and results in overall efficient baggage processing, on schedule."

Furthermore, Qatar Airways is currently working on end-to-end baggage tracing and the automation of lost baggage reporting to WorldTracer, with the overall goals of improved baggage handling among the stakeholders and improving customer satisfaction.



BAG TRACKING MOVES UP THE AGENDA

IATA's resolution 753 will herald a major step change in baggage handling when it comes into force in 2018. Its requirement that member airlines monitor and log the status of their passengers' bags through the major stages of the bags' journey is set to bring multiple benefits.

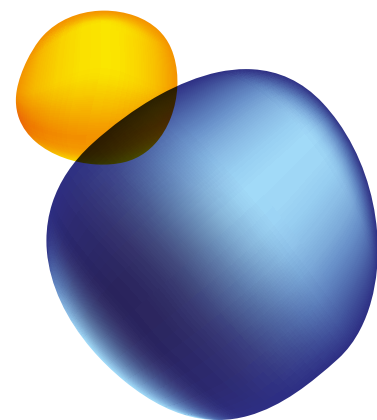
Passengers will not only enjoy a better service, the initiative also offers the prospect of an uplift in consumer confidence that their hold baggage will arrive with them at their destination. This in turn will create opportunities to improve other aspects of luggage handling in future, such as reducing the number of bags passengers take with them into the cabin.

On the operations side, it will help reduce the number of mishandled bags as the location of each bag is recorded when it changes custody, particularly when bags are delivered to the passenger on arrival, and when bags are delivered to the aircraft on departure. More accurate information will also speed up baggage reconciliations and flight readiness for departing flights.

IATA's Head of Airport Operations Management, Andrew Price, explained that the aim of the resolution is to provide standardized information on the bag's location and the transfer of responsibility between handling parties, "but there is a plethora of ways in which a bag can be tracked and we are certainly not going to prescribe a specific solution. At this stage, it is impossible to estimate the impact of good tracking on industry baggage mishandling costs. It depends on how well the data is used by each airline," said Price, adding, "When one major airline introduced 100% tracking they did see a 35% reduction in mishandling, so there will be savings."

Over 2014, the air transport sector has been exploring innovative approaches to tracking. Air France-KLM is leading a partnership with FastTrack Company, Samsonite and KPN, with input from Delta Air Lines and Sky Team, to develop an e-tag and a tracker that will turn suitcases into connected devices. The eTag is an electronic baggage label that communicates with the outside world via eTrack, or directly with the user's smartphone via Bluetooth, while eTrack lets both passengers and airlines track baggage anywhere it goes. The tracker, which uses GSM, GPS and Bluetooth technologies, features a patented Auto Flight Mode that ensures that it will be switched off and on at appropriate points in the flight to meet all regulatory requirements, even in regions with the most stringent GSM regulations.

The project team is currently in the end-to-end testing phase, prior to gaining certification and regulatory approval to fly the devices. They are aiming for a soft launch with staff and frequent flyers in Q3 or Q4 of 2015. Manager Product Innovation at KLM, Laila Ben Salah said the airline had already received lots of interest from customers, not just frequent flyers, who wanted to be part of the consumer testing or who wanted to buy the product.





Meeting passengers' desire for more information

"We see baggage is very important for the customer. Passengers have greater access to information and greater freedom of choice. They are also more aware of airport baggage performance and include airports in their purchase decision. A number of them are traveling with tracking devices although they are not approved by the authorities. That's why we started to develop eTag and eTracker," she said. "Customers are waiting for this. They want to have more control; to know where their baggage is and to have the same information as the airlines."

Tracker information can be pushed or pulled to the passenger's smartphone app. The data will also go to the airline so it can take recovery action if it sees, for example, that the bag has gone to the wrong gate. Ben Salah noted that if the passenger sees their luggage has been delayed, it is an important part of delivering a good guest experience that airline staff also know and are able to answer their questions about the delay.

Differentiating through baggage performance

For Middle East carrier Etihad Airways, baggage performance is a key differentiator from its competitors and baggage is regarded an integral part of its guests' flight experience. "Our vision is to be the best airline in the world and this applies to the baggage experience as well," said Paul Smith, Etihad Airways' General Manager, Airport Services. "It translates into a seamless check-in experience; clearly formulated and sufficient baggage allowances catering to our premium guests and long-haul flight guests; special handling of premium guests – such as the industry's fastest retrieval times of baggage after arrival at the destination; and a 24-hour one-stop-shop experience for any baggage enquiries."

Smith explained that Etihad Airways' business model includes two unique aspects that differentiate it from many other airlines and alliances; a significant ratio of transfer guests versus point-to-point, and one of the largest partner airline and codeshare networks in the industry.

"These two aspects create additional challenges to the smooth flow of baggage around the network, and it is clear that we need to take our baggage system to levels beyond the industry benchmark to make this experience seamless and unique," he added.

"We work very closely with IATA, airport authorities and third parties involved in all aspects of baggage – IT, technology, aircraft manufacturers, and luggage manufacturers – in order to pioneer innovative solutions that will enhance our guests' baggage experience to another level. We also aim to promote minimum delivery standards that would be valid across airports globally."

Etihad Airways is setting up a Baggage Centre of Excellence, which focuses on optimizing processes and platforms to boost efficiency, as well as combining back office functions to achieve economies of scale. The Centre will support all pre-flight and post-flight inquiries related to baggage within the Etihad Airways global network, including 24-hour customer service, tracking and tracing, baggage projects and innovations.

This year, Etihad Airways has set itself the goal of achieving a 100 per cent baggage reconciliation system (BRS) network, which will be the foundation for further baggage enhancements. It is also investigating several value-added baggage services, including permanent tags with self-tracing capability (giving its guests visibility over their bags at all times) and specially-designed premium suitcases that would be offered to members of its loyalty scheme, Etihad Guest.

For Etihad Airways, bag tracking needs to be just like tracking a parcel online. “Going forward, our guests should be able to see where their bags are – after all, it’s an interactive enhancement to their travel experience, similar to other travel applications, such as Flight Radar,” said Smith. “Internally, we should also be able to see the last-known position or scan of the bag and in case of any disruption, work with sophisticated tracing scenarios.”

However, he noted that a full and successful implementation of IATA’s resolution 753 on bag tracking will also require an equally intense focus from airport authorities around the globe. “We would be keen to support IATA in promoting a set of minimum requirements for all airports in relation to baggage messaging, BRS, handling times and baggage security. Also, we would encourage IATA to engage with customs authorities to achieve a global standard for clearance of disrupted or repatriated bags.” Smith said.

Infrastructure will be the challenge going forward. “As the tracking happens at an airport, airlines might not be in a position to specify exactly the equipment that they want and the process. Some airports might look at the opportunity to provide tracking information as a service to airlines, and there is also space for airlines to cooperate in the sharing of tracking data and infrastructure” said IATA’s Andrew Price. “I do not think that every airport will have the facilities to allow tracking before 2018, but see this as a good target to aim for.” In future, as the bag-tracking capability increases passengers’ confidence that their bags will be delivered to them in a timely fashion, the likelihood is that more travelers will opt to take advantage of airlines’ hold baggage services. This will improve the overall passenger experience according to Price. “Any reduction in cabin baggage volumes would make boarding and deplaning faster, the cabin environment safer and perhaps more comfortable. Eventually you might even see aircraft designs that take advantage of reduced cabin bag needs – imagine overhead windows rather than luggage bins.”





BAGS IN THE LAB

Technology research to address air transport operators' desire to mobilize their baggage operations staff is moving out of the lab and being utilized by airport ground handlers, with 2014's pilot projects set to become mainstream product in 2015.

Space is a precious commodity in modern airports, with ground handlers under pressure to reduce their foot print and even desk top space is at a premium. Meanwhile, passengers want to be accommodated with wherever they are, particularly when stressed by disruptions. SITA's technology research team, SITA Lab is helping the industry to meet these demands by developing a WorldTracer application for tablets, featuring a process-oriented graphical user interface that allows non-baggage staff to access baggage data. It was trialed in a number of airport scenarios last year, with feedback from Malaysia Airlines' staff using the product at Kuala Lumpur International Airport and ground handler DNATA using it in Geneva and Zurich airports helping to fine tune product development.

SITA Portfolio Director, Airport Solution Line, Nick Gates said that when it is launched in mid-2015, the app will provide complete delayed bag, damaged bag and baggage found-and-received functionality, plus custom forms and photographs of damaged bags.

Using the WorldTracer app via the tablet, airline agents can proactively manage delayed or lost bag claims from anywhere in the airport. They simply scan the passenger's boarding pass and bag-tag receipts to retrieve all the available information about the passenger, their itinerary and bag status, file a delayed or lost bag report and issue the passenger with a receipt via a mobile printer. No major infrastructure changes are necessary, the ground handler just needs to purchase the tablets and have Wi-Fi or 3/4G access to the internet.

The app draws on both open source and commercial software libraries, and integrates several application program interfaces (APIs) from SITA's developer.aero platform for air transport industry developers. The integration of BagJourney has been particularly useful according to Gates. "It enables the user to provide the passenger with instant feedback on where their luggage is from scanning a bag-tag receipt. At the same time the information from BagJourney assists the user to complete the report without the passenger having to fill in forms."

By sending agents with WorldTracer tablets directly to the baggage carousels, Malaysia Airlines halved the average time for processing mishandled bags down to about five minutes, saving their customers from searching for the right counter and having to complete forms via desk top terminals.

Greater efficiencies go hand-in-hand with improved levels of customer service: "Feedback from passengers has been good in that they like to be processed where they are. The tablet app forces ground handlers to be more proactive in seeking out passengers, which in turn is deemed by passengers as providing a much better customer service," said Gates.

At Singapore's Changi Airport, ground handler SATS is currently trialing the use of WorldTracer tablets at the arrivals baggage claim belts to enable passengers to report a missing bag on the spot, with the help of its staff. Early feedback from SATS is that its team members have been able to speed up response and processing times; furthermore they have minimized the need for passengers to travel to a physical office to report their missing bag.

The initiative takes the ground handler one step closer to its vision for a fully automated and user-friendly baggage experience at the airport. "The future baggage experience is envisaged to be fully automated and readily traceable from anywhere along the process of check-in until bags are loaded onto the aircraft. Self-service facilities will be user-friendly and intuitive, possibly with minimum input of data, maybe scanning passenger documents or leveraging near field communications technology," said a SATS spokesperson.

COLLABORATION

GOOD PROGRESS AND NEW BAGGAGE INITIATIVES

Report from International Air Transport Association IATA

The IATA InBag program, aimed at improving baggage processes across the industry, has built solid foundations for airlines to build upon. Here is a recap where we are, with a view to how things will change in the coming years.

All carriers should be using the 10-digit baggage license plate identifier since June 2013. This helps match the correct baggage information message and bag together, as many airlines are now using leading digits to support their baggage processes. These leading digits were simply lost if a message was sent using either the alphanumeric airline code (for example, BA rather than 125) or if the departure control system (DCS) defaulted to a 9-digit match.

This does not solve the baggage identification issue though, so in 2014 we introduced the baggage universally unique identifier (UUID). This is a unique reference to a bag that underpins many new applications. The UUID will be adopted in the baggage information messages as a reference that can be used in addition to the 10-digit license plate. Those changes will be proposed for Recommended Practice 1745 for baggage information messages in 2015.

The UUID is essential for the introduction of radio frequency identification (RFID) to baggage tags. RFID is a component of the electronic baggage tag, the standard for which was approved in 2014 by the Passenger Services Conference. The RFID component allows these tags, and also any other baggage tag using RFID, to be easily linked to the existing baggage messages. This is very useful for tracking bags without investing in changes at the baggage system level to support RFID implementation. RFID could also be a component of the home-printed baggage tag holder, and some disposable tags. Now, airlines can use the RFID component of the tag to track the bag throughout its journey with low-cost RFID readers.

Why is this important? IATA is introducing a requirement for airlines to track bags (record the delivery and acquisition) at key process steps by 2018. This is encapsulated in Resolution 753, passed last October. The new resolution requires evidence of tracking on arrivals, transfer and loading to the aircraft, as well as a baggage manifest message to be provided to subsequent partners in the journey, such as the airport of arrival.

UUID is also a key component in the security screening architecture being proposed by IATA in 2015. Without a unique reference the remote screening of bags is not possible, because the reference to the bag might be duplicated. This remote screening could save the industry minutes on a baggage transfer process thousands of times a day. This could also allow some reduction in screening equipment. One of the main opportunities for the introduction of remote screening is the provision of images to other processes, such as customs. By pre-clearing bags on an inbound flight it would be possible to avoid the lengthy queues to get into some countries.

Last year also saw the simplification of prorated rules that govern how airlines split the cost of recovering mishandled bags, with some 13 examples where a clear 100 percent prorated for baggage claims could be made being introduced in Resolution 743c. This is the first step in the journey to automatic baggage prorated for the vast majority of claims. This will allow airlines to operate their prorated process much more efficiently. The other change in prorates was the elimination of the US\$50 threshold on delivery claims. Now all deliveries can be prorated, which addresses a major concern for some smaller last leg carriers.

The winter storms of 2014 have been repeated this year, and to help airlines and airports complete their strategy for disruption, the IATA Baggage Disruption Working Group has produced a paper on how to cope when things go wrong. This starts the work on an overall airport disruptions initiative that will be developed in 2015. The paper analyses the types of disruption and which ones can be planned for versus those that need a strong communications strategy.



A big area of development in 2014 that will grow in 2015 and beyond is the use of baggage XML messaging. A pilot was completed between two airlines and airports that sent baggage process messages between trial parties. In 2015 this will be extended to mirror a physical journey for real bags. Finally it will be able to publish and subscribe for baggage messages.

Perhaps the most anticipated areas where progress was made though were in the home-printed and electronic baggage tag areas. The resolution for these was approved last October. Europe is seriously behind the times in regulation to allow the use of either tag, but the rest of the world is charging ahead and passengers are already seeing the benefits. Arriving at the airport with everything ready is a major stress reducer. Hopefully 2015 will see the European Union regulators enable their citizens to benefit also.

ANDREW PRICE

HEAD OF AIRPORT OPERATIONS MANAGEMENT, IATA



A WEB SERVICE TO BETTER SERVE PASSENGERS

Report from Airports Council International World

A project to give passengers more convenient bag check-in and better information about their bag location is under way. At the same time, airports and airlines will gain greater control over the baggage handling processes at a reduced cost. The initiative, launched in 2014, is being undertaken by Airports Council International ACRIS (Airport Community Recommended Information Services) and IATA's Common Use Working Group.

The collaboration will define the web services that will be required to achieve common-use and self-service bag-drop, as well as other baggage management initiatives. These services cover a number of capabilities that ensure bags conform to a predefined set of criteria, including: capturing critical information about the bag and turning that into a unique ID; tracking the bag on its journey; checking that the bag meets the carrier's requirements; and authorizing the bag to proceed. In addition, the web services include an extensive e-learning tool to train staff and measure productivity by skill level, for example agent, supervisor.

We can understand these web services as modules, if you like, that are designed to connect to each other and that can be assembled in different combinations, depending on who needs the information. The same set of modules will provide baggage information solutions to multiple users, including passengers, airlines, ground handlers and airports, and across multiple devices.

The goal is to reduce resource overheads by improving communications between all stakeholders while also cutting the cost of creating and maintaining bag data. For example, using the web services would lessen the complexity (and therefore the associated costs) around integrating bag-drop hardware and airline host systems. As a result, airports would be able to roll out pilots with new bag-drop vendors more easily, and implement bag-drops more rapidly.

Passengers will benefit from the initiative by being able to take charge of their own check-in process and use self-service bag-drop stations, saving time that might previously have been spent queuing at an agent-assisted bag-drop. They will also have more choice about where to check-in their bags as self-service bag-drops can be located throughout the airport terminal.

Airports will benefit by being able to reduce the space required for baggage check-in and improve their operational performance. By implementing these web services, both airlines and airports will be able to track and trace baggage automatically, reducing the number of lost bags, which will improve passenger satisfaction, improve efficiencies and profit margins. Furthermore common IT and communication standards between aviation partners will help to facilitate the harmonization of airline/airport systems.

SERGE YONKE NGUEWO
MANAGER, FACILITATION AND AIRPORT IT, ACI WORLD



APPENDIX

WHAT IS A MISHANDLED BAG?

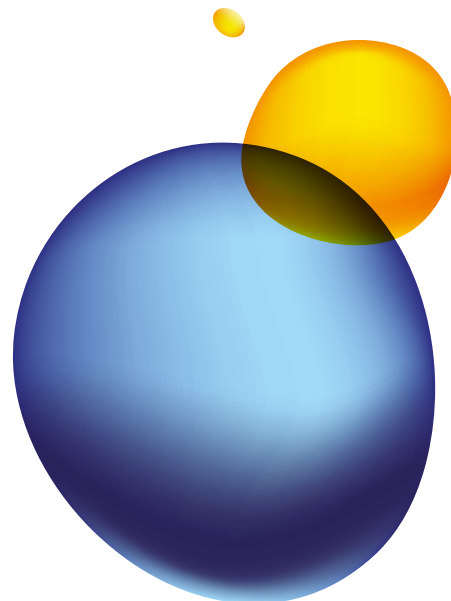
A mishandled bag is a report of a delayed, damaged or pilfered bag which is recorded by either an airline or its handling company on behalf of the passenger and that is handled as a claim.

SCOPE OF 2015 BAGGAGE REPORT

SITA has produced an annual baggage report since 2005. It is designed to offer all air transport industry stakeholders the latest facts, figures and trends related to global baggage processing and management. In this report, global data for 2014 on mishandled bags from SITA's WorldTracer.

It should be noted that 2014 industry data used in this report is drawn from IATA forecasts for the year, issued in December 2014.

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 all around the world – generating savings for the industry, while improving the overall passenger experience.



NOTES AND REFERENCES

- Note 1**
Page 4 IATA press release, Airline Profitability Improves with Falling Oil Prices, issued 10 December 2014.
- Note 2**
Page 4 Airport IT Trends Survey 2014: 25% of airports say baggage processing and management was high priority for IT investment in 2014.
- Note 3**
Page 4 Airport IT Trends Survey 2014: 35% of airports have implemented bag-tag printing at kiosks. Airline IT Trends Survey 2014: 34% of airlines have implemented bag-tag printing at kiosks.
- Note 4**
Page 4 Airport IT Trends Survey 2014: 36% of airports are planning to implement assisted bag-drop stations by the end of 2017.
- Note 5**
Page 4 Airline IT Trends Survey 2014: 12% of airlines provide missing bag communications via smartphone apps today, with another 57% having plans to implement over the next three years; 11% enable missing bag reports, with another 55% having plans to implement by the end of 2017.
- Note 6**
Page 5 Passenger IT Trends Survey 2014: 26% of passengers regularly use permanent bag-tags; 24% regularly self-print bag-tags at home; and 26% self-print bag-tags at a self-service kiosk.
- Note 7**
Page 5 Passenger IT Trends Survey 2014: 23% of passengers regularly used unstaffed self-service bag-drops; 44% regularly use dedicated staffed bag-drop areas.
- Note 8**
Page 5 Passenger IT Trends Survey 2014: if all were equally available to them in the future, 41% of passengers would make more use of permanent/reusable bag-tags; 41% would make more use of self-printed bag-tags at home; and 44% would self-print bag-tags at kiosks. Similarly, if all were equally available to them in the future, 37% of passengers would make more use of fully self-service bag-drops; and 49% would make more use of dedicated staffed bag-drop areas.
- Note 9**
Page 5 Passenger IT Trends Survey 2014: 81% of passengers carry a smartphone, up from 76% in 2013.
- Note 10**
Page 5 Passenger IT Trends Survey 2014: 66% would definitely use real-time baggage information on their mobile, such as confirmation their bag has been loaded on the aircraft or the arrival belt number.
- Note 11**
Page 5 Passenger IT Trends Survey 2014: 20% of passengers say significant improvements are needed to check-in and bag-drop-off and 50% say some improvements are required; 24% say significant improvements are needed to collecting bags at the destination and 51% say some improvements are required.
- Note 12**
Page 6 An example of this trend is detailed in the Wall Street Journal, "Skinnier Seats on More Crowded Planes", by Scott McCartney, published 29 October 2014, <http://www.wsj.com/articles/skinnier-seats-on-more-crowded-planes-1414602406>
- Note 13**
Page 6 IATA press release, Strong Demand for Air Travel Rises in 2014, issued 5 February 2015: the industry achieved a global passenger load factor of 79.7% in 2014, up 0.2 percentage point from 79.5% in 2013.
- Note 14**
Page 7 Calculation based on IATA's estimates that the total industry operating cost was US\$713 billion in 2014 and operating profit was US\$38.3 billion. The industry forecasts are available in Airline Industry Economic Performance tables issued by IATA Economics in December 2014.
- Note 15**
Page 8 15. IATA Airline Industry Forecast 2013-2017, published October 2013: for the international passenger market, the Middle East is expected to be the fastest growing region, with a five-year compound annual growth rate of 6.3% per annum, highlighting its increasing role as a regional aviation hub.



SITA AT A GLANCE

The air transport industry is the most dynamic and exciting community on earth – and SITA is its heart.

- 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 around 450 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 2013, we had consolidated revenues of US\$1.63 billion.

For further information, please visit www.sita.aero



For further information, please contact SITA by telephone or e-mail:

Americas

+1 770 850 4500
info.amer@sitaaero.com

Asia Pacific

+65 6545 3711
info.apac@sitaaero.com

Europe

+41 22 747 6111
info.euro@sitaaero.com

Middle East, India & Africa

+961 1 637300
info.meia@sitaaero.com

Follow us on www.sita.aero/socialhub

