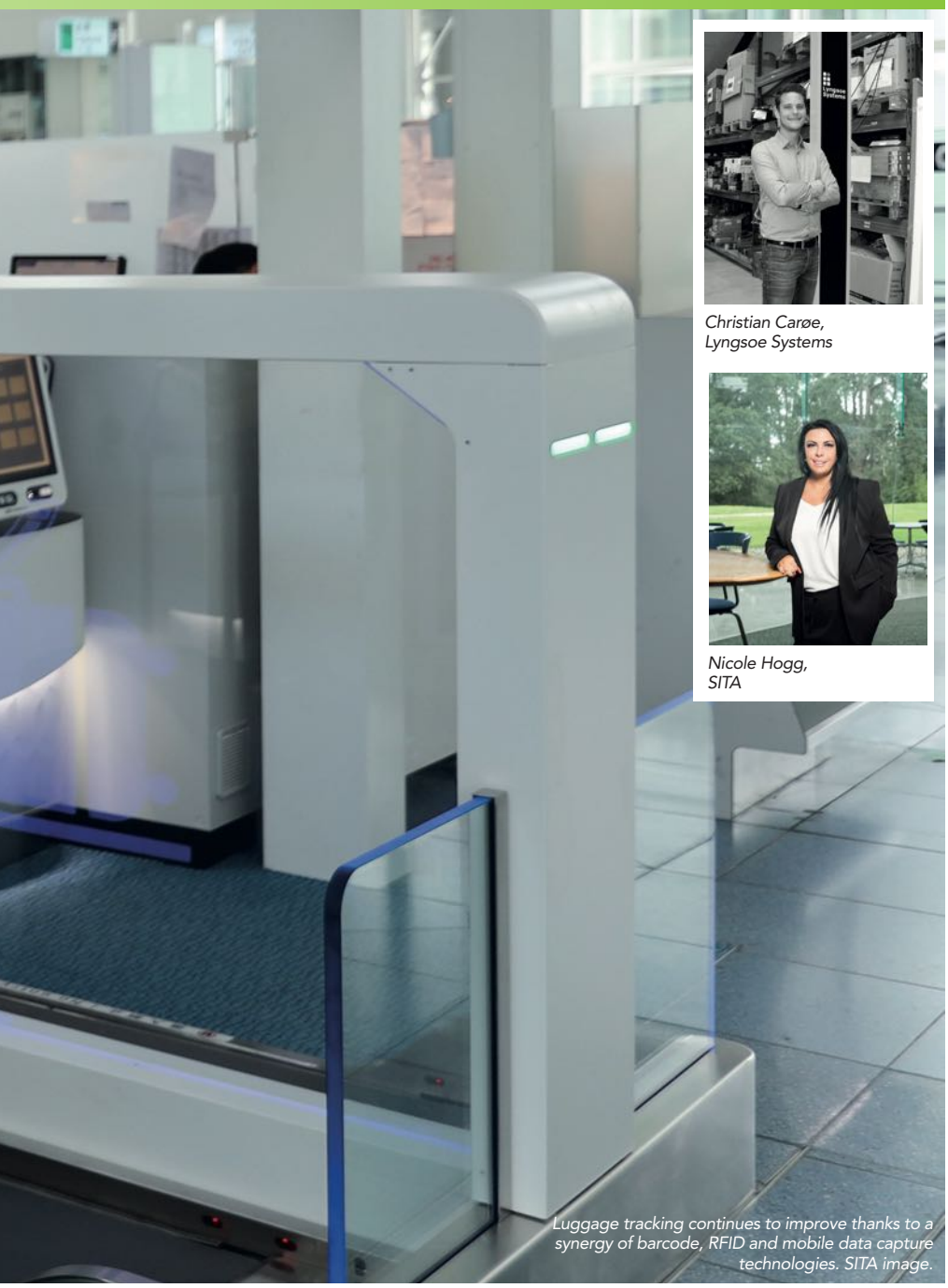
# Checking In On Luggage Tracking

Lost luggage is a fact of life for airline travelers. According to the SITA Baggage IT Insights 2024 Report, 36.1 million bags were classified as mishandled in 2023. During that year, "delayed bags made up 77% of all mishandled bags," the SITA report said. "At the same time, the number of lost and stolen bags slightly decreased to 5% in 2023. Meanwhile, damaged and tampered bags increased to 18%."

This being said, there were 5.2 billion airline passengers globally during the 2023 travel year, which was the highest annual total since Covid. As a result, "the mishandling rate actually went down from 7.6 to 6.9 bags per thousand passengers," the SITA report said. "The fact that 49% of airports are investing in baggage processing as part of their business initiatives has helped cope with the recovery in passenger numbers."

Baggage processing is another term for luggage tracking, and luggage tracking is what this article is all about. As with other areas of air travel and airport operations, modern technology has vastly improved the efficiency, reliability and security of luggage tracking. In this story we'll look at some of the companies who are in this

## By James Careless



Luggage tracking continues to improve thanks to a synergy of barcode, RFID and mobile data capture technologies. SITA image.



Christian Carøe, Lyngsoe Systems



Nicole Hogg, SITA

field, the technologies they're employing to track airline luggage, and how these technologies are making it more likely that your bags will arrive at the same destination you're heading to when you do.

### Three Key Players

There are three key players in the luggage tracking industry who responded to TSI magazine's request for interviews for this story.

The first of these companies was Lyngsoe Systems. Its Lyngsoe LIVE Logistics RFID (radio frequency identification) tagging system allows airlines and baggage handlers to label, wirelessly scan and electronically track the location of luggage from ingest to delivery.

"By using RFID, Lyngsoe Systems is able to support IATA Resolution 753 on baggage tracking, allowing us to track tagged luggage at four designated handover points (check-in, loading, transfer, and baggage claim) throughout airports," said Christian Carøe, director of this company's technology and platform department. "Basically, baggage is lost at handover points, and when you lose a bag in this way you typically do not know who's actually responsible for making sure that the lost baggage will catch up with you. In this matter, IATA Resolution 753 is helpful, as you are now supposed to have tracking points on your baggage at every single handoff point."

That's not all: "Another advantage of utilizing RFID technology is to be able to bulk scan all the bags when they're in the cart or in the containers that they've been stored in before they're loaded into the aircraft," Carøe said. "This is a big improvement over manually scanning each individual barcode on a bag."

SITA bills itself as "the world's leading specialist in air transport communications and information technology." At the very least, SITA's publication of an annual baggage insights report speaks to its commitment to the luggage tracking sector.

According to Nicole Hogg, SITA's director of baggage, "SITA WorldTracer is the world's only fully global baggage tracing and reconciliation system. In the rare event that baggage is mishandled or delayed, WorldTracer enables airlines to locate a passenger's baggage anywhere in the world. It is now in use at 2,800 airports worldwide. WorldTracer also works with baggage management and reconciliation systems such as SITA BagManager, which helps airlines, airports and ground handlers reconcile, track and manage baggage from check-in to arrival."

Also designed to support IATA Resolution 753 and its emphasis on RFID tagging, SITA WorldTracer relies on each piece of luggage being fitted with either a barcode or RFID tag. Each tag, which is linked to the passenger's personal information file, has a unique identity

within the WorldTracer system. Every time the tag is scanned, its location and time of encounter are recorded in the WorldTracer Global Database. When a bag doesn't show up as expected, it can be located through a real-time search of this database from pretty much anywhere on the planet.

Zebra Technologies is a broadly-based technology firm that helps businesses track their assets using barcode and RFID tagging systems, connect to their frontline workers and employ intelligent automation to improve their processes. "The company operates in more than 100 countries, and our customers include over 80% of the Fortune 500," said Stephen Mulroy Zebra Technologies' logistics solutions manager. "Designed for the frontline, Zebra's award-winning portfolio includes hardware, software, and services, all backed by our 50+ years of innovation and robust partner ecosystem. Zebra provides a number of solutions to the aviation industry above and below the wing, including solutions for customer experience, logistics, inventory management and luggage tracking."

## The Evolution of Luggage Tracking

Security Label is a baggage identification and tracking company based in Sarstedt, Germany. "The first luggage tag appeared at the end of the 19th century in Moncton, New Brunswick," the company says. "It was patented on June 5, 1882, by John Michael Lyon and used for train travellers. It contained several items of information, including the station of departure and arrival, and a consecutive number for reference. The lower part of the ticket was given to passengers, while the upper part had a hole through which it could be inserted into a brass sleeve and attached to luggage with a strap."

The aviation industry began to adopt luggage tags in the 1920s, after the industry had surpassed its early days of passengers putting their own luggage


*The aviation industry began to adopt luggage tags in the 1920s. They were based on the model used in maritime transport, but one important difference was the necessity to take into consideration the weight of the baggage. Lyngsoe Systems image.*

*Addressing key pain points in the baggage journey through intelligent automation, tracking and digital platforms is crucial. The ultimate goal is safety and security but also restoring passenger confidence in checking in their bags. Lyngsoe Systems image.*

on small planes. "They were based on the model used in maritime transport, but with one important difference: the weight of the baggage," the Security Label website said. "While weight was of little importance in the maritime sector, it was essential in aviation in order to distribute the load in the aircraft."

Airlines began to adopt the baggage tags used by railroads in the 1930s, adding their own logos and spaces to write in the passenger's name and personal information. "Initially, the industry relied on manual tagging and paper-based systems, but since the 1980s the industry has been using barcodes to track luggage and assign it to traveling passengers," said Mulroy. "Recently, the advent of RFID technology (as advocated by IATA Resolution 753) has enabled more advanced solutions which allow for real-time tracking and automated data capture, marking a pivotal shift in how luggage is monitored and managed."

## The Current State of Luggage Tracking

Moving to automated baggage handling and tracking has helped deliver the improvements noted in the SITA Baggage IT Insights 2024 Report. "As the airline industry has invested in technology and moved away from manual processes, we've already seen the effectiveness of technology for baggage processes," Hogg said. "The widespread adoption of automated baggage tracking and reclaim technologies such as SITA's BagManager v6, BagJourney, WorldTracer Tablet, WorldTracer Desktop, WT Self Service, NetScan and Worldtracer Baggage Delivery Service has helped reduce the mishandled baggage rate per thousand passengers by 63% between 2007 and 2023. For instance, SITA BagManager reconciles and tracks bags throughout their end-to-end journey."

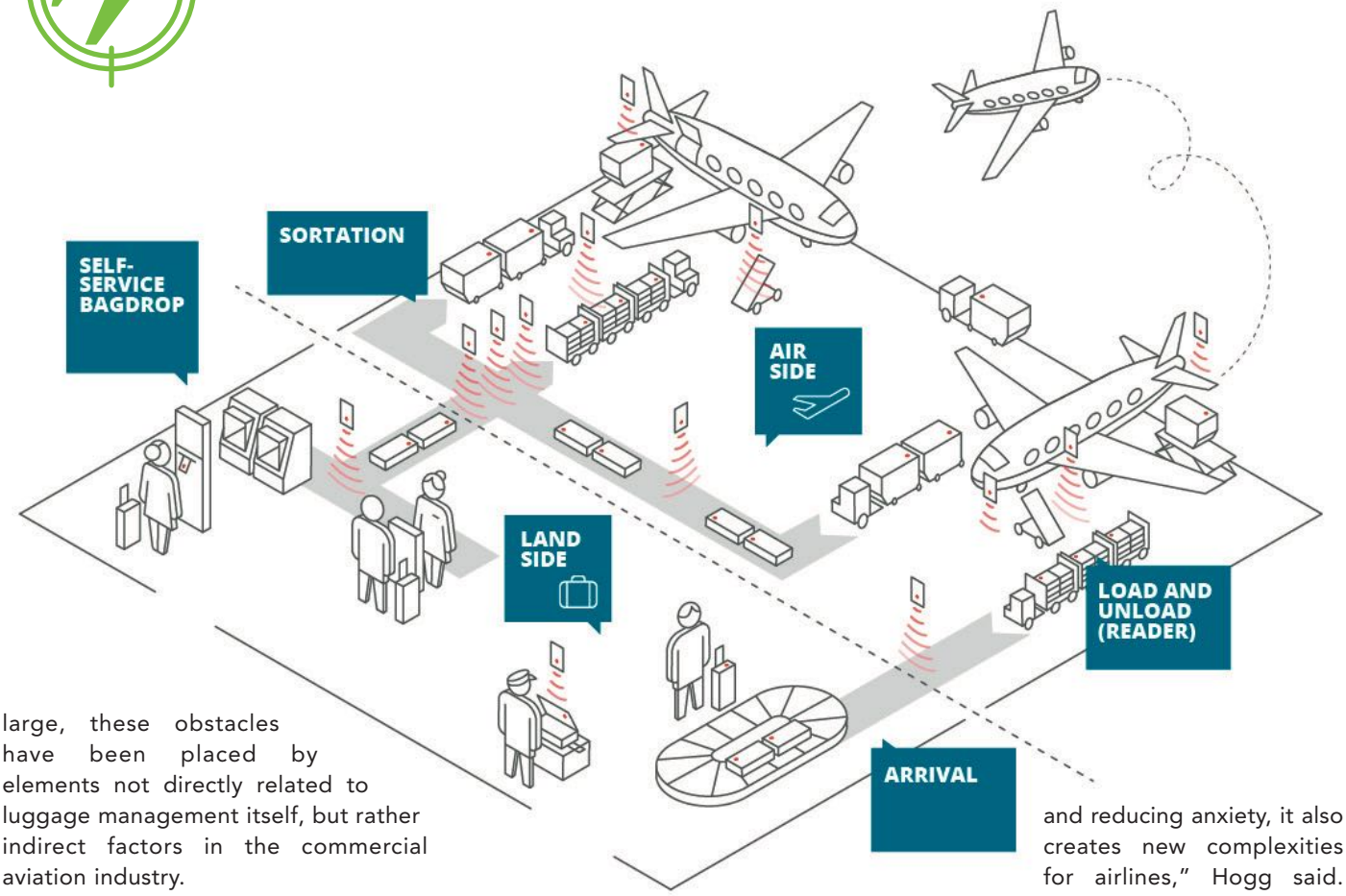
This being said, gearing up to comply with IATA Resolution 753's requirement for RFID tracking technology is a financial challenge for some airports. "As RFID tags become more common in the industry, smaller airports are having to find the money to add the necessary infrastructure to scan them," said Carøe. "The difficulty in doing so is the reason why the deployment of RFID luggage tracking is going slower than one might like."

Nevertheless, progress is being made. "The current state of baggage tracking technology reflects a combination of innovation, increased passenger expectations and the need for operational efficiencies to improve the accuracy of baggage tracking," Hogg said. "The industry has recognized the importance of technology in addressing current challenges and airlines are investing in IT solutions that enable greater automation and self-service."

To speed the process up, companies such as SITA are working directly with airlines and airports to address key pain points in the baggage journey through intelligent automation, tracking and digital platforms — with the ultimate goal of restoring passenger confidence in checking in their bags. "We're also working to provide end-to-end visibility of the entire baggage journey, ultimately enabling passengers to track their bags in the same way they would track the delivery of a parcel," said Hogg. "The SITA WorldTracer Auto Reflight service automates the process of handling baggage that cannot be carried with the passenger on the original flight, enabling higher volumes of delayed baggage to be processed and minimizing the risk of further disruption at later points in the journey."

## Overcoming Obstacles in the Road

Despite the good news above, there are still obstacles in the road towards minimal misplaced baggage. By and




large, these obstacles have been placed by elements not directly related to luggage management itself, but rather indirect factors in the commercial aviation industry.

A case in point: "Today, the pressures on the travel industry and the technology it runs on have grown due to several factors in addition to greater throughput of passengers," Mulroy explained. "They include passengers' easy access to technology, enabling access to cheaper flights; rising labor shortages in the sector increasing pressures on airport and airline operators; and a squeeze on operating costs due to competition between carriers, airports and airport operators vying for passenger numbers and flights."

That's not all: Factor in airline/airport budget cuts, ever-increasing passenger footfall and passengers traveling with multiple bags on transfer flights, and one can see why tracking baggage accurately remains a challenge. "Suitcases falling from airport delivery vehicles and going unreported, baggage remaining on the aircraft, and unidentifiable lost luggage compound the issue," said Mulroy. It seems there is a general increase in the need to rush, and rushing creates opportunities for errors.

Despite these obstacles, luggage tracking continues to improve thanks to a synergy of barcode, RFID and mobile data capture technologies. "However, although RFID has a high level of awareness, its adoption is by no means universal," he said. As a result, lost luggage continues to cost the commercial aviation industry billions of dollars every year.

"Although the number of misplaced or misrouted items has fallen significantly in the last decade, it's still a problem for many carriers, especially in less popular destinations where tight margins mean every outlay on infrastructure is tightly controlled," said Mulroy. "Fortunately, automated systems in static installations behind the scenes at airports are capable of scanning and identifying thousands of baggage items an hour, reducing ground staff costs and ensuring smoother, safer, and more secure operations. So when luggage does go missing, passengers can be contacted via their personal details, lowering the number of incoming inquiries to support personnel."

Ironically, the ability for passengers to now track their bags online thanks to advances in luggage tracking technology has caused issues of its own. "While this capability improves the passenger experience by providing transparency and reducing anxiety, it also creates new complexities for airlines," Hogg said. "Passengers have an expectation that if they can track their pizza delivery or Amazon package online easily, they should be able to track their bags without problems." It's as if they believe luggage manufacturers started embedding GPS tracking devices in their suitcases. But that is a discussion for another day.

Given that the science of luggage tracking is meant to solve problems, it comes as no surprise that the companies in this article are doing their best to address the obstacles noted above. For instance, "partners like Zebra Technologies work closely with airports, airlines and ground handling service providers to ensure that solutions are tailored to meet specific operational needs," said Mulroy. "RFID and barcode systems are thus being designed for easy integration with existing infrastructures, facilitating smoother transitions and improved interoperability. Additionally, Zebra invests in training and support services (for employees) to ensure that staff are proficient in using our technologies, thereby reducing the likelihood of human error."

"As an industry, if we don't tell passengers where their bags are, they will tell us (the airlines), so SITA is now

working with Apple to allow passengers to share their Air Tag location with WorldTracer," Hogg said. "Specifically, SITA WorldTracer Auto Notify provides passengers with real-time information on the status of their baggage, informing them if their baggage is delayed as soon as they disembark from the aircraft. It tells them where the bag is, when they can expect to see it again and directs them to SITA WorldTracer Self Service to enter delivery details. This prevents them from waiting at the baggage carousel for their bag to show up."

## Advances to Come

Luggage tracking has evolved from none at all to RFID-based systems that can chase down bags anywhere on the planet. But as amazing as these capabilities are today, the future could be even more impressive.

"Looking to the future, the industry and its partners should commit to advancing luggage tracking through the development of smarter, more connected solutions," said Mulroy. "For example, AI and machine learning could be used to predict and prevent issues before they occur, thereby optimizing luggage handling and routing. There's also the potential of blockchain technology to enhance transparency and security in tracking systems."

"The future of luggage lies in investments in electronic bag tags with integrated tracking devices, and visual identification of bags using computer vision and AI," Hogg said. "Investing in these kinds of luggage tracking systems would prevent mishandling, solve problems with unreadable/missing tags, and reduce tracking infrastructure costs."

All things being equal, the power and potential of luggage tracking systems has yet to be fully tapped. Such are the possibilities, that the incidence of misplaced bags in the future may become so rare as to become remarkable, rather than commonplace. TSI