


Regional GATEWAY

Dedicated to regional and business airports

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On the carousel to a greener future

Reducing the carbon footprint of baggage handling

Wildlife strike • Remote towers • Winter services • Travel retail
• Cornwall Airport Newquay • BizAv hangarage • Spotlight on Nigeria



Best (suit) case scenario

Whilst aviation pins its hopes on sustainable jet fuel, electric aircraft and hydrogen-propelled flight to mitigate its carbon footprint, the environmental implications of passenger luggage are often overlooked. Paul Sillers reports.

As much as a quarter of the energy expended by commercial flights is attributable to the transportation of passenger baggage, and the climate impact goes far beyond the CO₂ churned out by the combustion of jet fuel.

Case in point: 300,000 trees are felled every year to produce the paper required for barcoded baggage tags. Then there are the gigawatts of electricity consumed by the miles of luggage conveyor belts



Baggage handling

that meander around airport terminals 24/7, even during the dormant periods – who hasn't spotted a lone deserted suitcase orbiting interminably around the carousels in the baggage hall?

The environmental consequences are worse if things go awry. When that cherished Louis Vuitton valise or gleaming Rimowa trunk gets mishandled in an airport's baggage handling system, an additional 30% of energy is squandered due to the extra transportation required to reconcile the bag with its owner. And the metrics are daunting: In 2018, 24.8 million bags were mishandled, precipitating the release of 8,000,000kg of CO₂ into the atmosphere. And in 2020, according to SITA's Baggage IT Insights,

Why do we have eTickets, digital boarding passes, biometric border passage, but when it comes to suitcases we are still fumbling with labels, prickers, scales and forms – it's disastrous.

Marlon van der Meer, Founder and CEO, BagsID

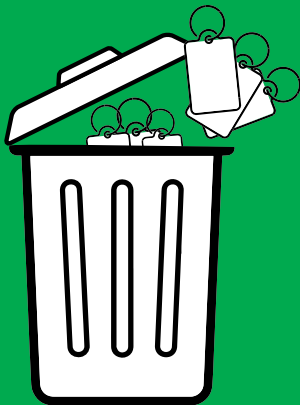
there were 3.5 mishandled bags per thousand passengers.

"Why do we have eTickets, digital boarding passes, biometric border passage, but when it comes to suitcases we are still fumbling with labels, prickers, scales and forms – it's disastrous," Marlon van der Meer, Founder and CEO of BagsID, tells *Regional Gateway*.

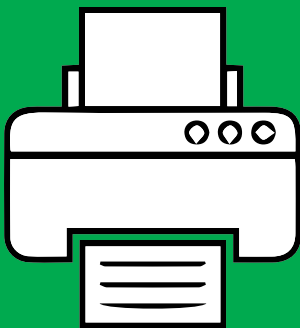
VIRTUAL TAGS

BagsID's SaaS network offers baggage recognition and authentication with autonomous categorisation, data extraction and data collection. Its 'virtual tag' technology captures images (via passenger upload using a smartphone app or taken automatically by cameras

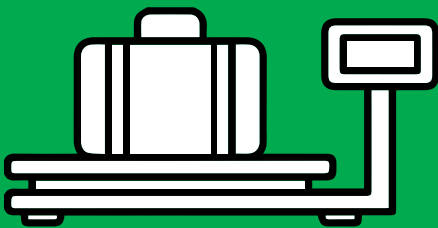
The cost of bag tags



Fifty million kilograms of paper tags end up in the trash every year



130,000 label printers are permanently connected to the power grid



An estimated 60,000 electric scales are connected to the power grid

during luggage check-in) which can be used to match baggage with the correct passenger throughout the entire journey. The system digitally encodes the bag's dimensions, colour, IATA classification, and other unique characteristics including stickers and scratches. It's not unlike the biometric methods commonly used at airport terminals to identify passengers.

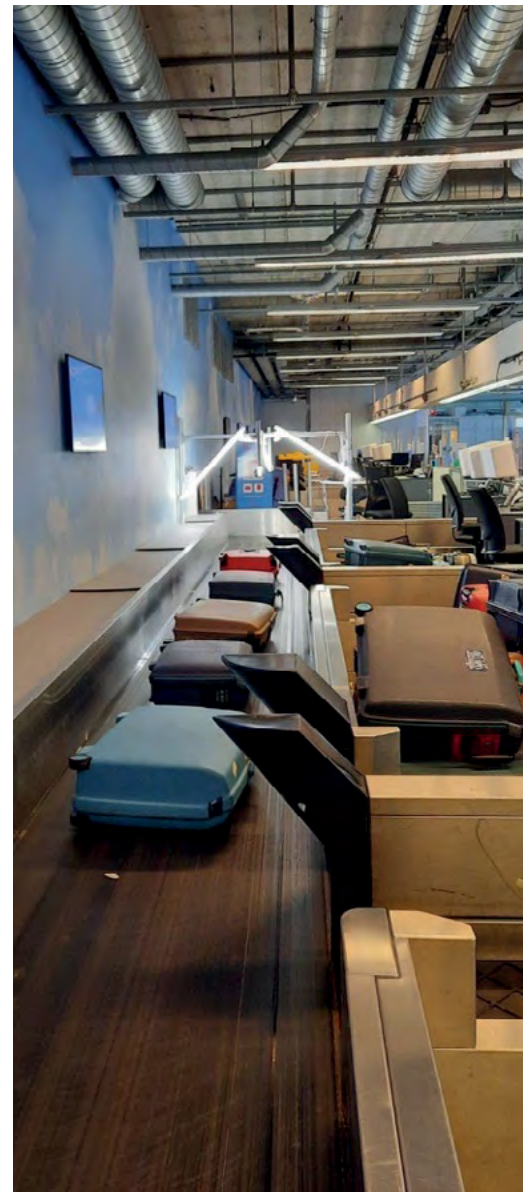
"BagsID wants to have a picture of every suitcase from which a data profile can be made. With this data, new services can be developed," explains van der Meer. "Fifty million kg of paper tags end up in the trash every year, 130,000 label printers are permanently connected to the power grid and an estimated 60,000 electric scales – all of this is out of date," he adds. In trials, BagsID's virtual tags proved to be over 99% accurate compared with around 95% for conventional paper tag systems.

Van der Meer also emphasises that the energy-saving potential of reducing mishandled bags is complemented by the lower capital expenditure required for the installation of virtual tag technology compared with today's barcode systems, making the economics of virtual tags attractive for smaller airports.

"Regional airports are pretty interesting for us because normally a barcode reader arch can cost around €35,000 – that's just the device to read the barcodes. A full arch with cameras and laser embedded barcode scanners costs approximately €100,000, whereas our cameras cost around €3,000."

GREEN BAGGAGE ALLIANCE

Van der Meer's ambitions go beyond transitioning the baggage landscape from paper to virtual tags: Last year, at the Future Travel Experience in Las Vegas, BagsID teamed up with Dutch aviation consultancy NACO to launch the Green Baggage Alliance, which aims to attract industry stakeholders to work collaboratively on data-driven solutions that deliver sustainable energy efficiencies for baggage handling.



Case study: the Green Baggage Alliance aims to deliver sustainable energy solutions for the baggage handling industry.

"The alliance is a membership forum to benchmark what the environmental footprint of baggage actually is," says Taco Spoor, NACO's Director Business Development Europe and Co-founder of Green Baggage Alliance. The objective is to be able to "formalise some form of service certification standards to enable stakeholders in the airline baggage ecosystem to reduce energy usage and mitigate their carbon footprint."



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"With this Alliance, we want to look at baggage from a passenger perspective from ground handling, to flight, to luggage retrieval, and see where we can reduce the footprint."

Spoor explains that the Alliance is seeking "a group of like-minded companies to join." The main potential members are airports, airlines, ground handlers, baggage equipment suppliers, and potentially also regulatory bodies. The Alliance is already working with TU Delft (University) in Holland.

Spoor reveals that the Alliance is also getting interest from Asian and South American airports, "and we're taking into account that some markets are mature and maybe have a higher focus on this than other markets. The Nordics will be very relevant where there's the issue of flight shaming."

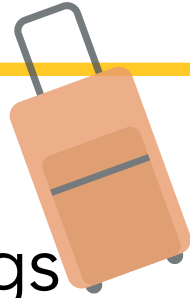
BAGGAGE SYSTEMS FOR THE LONG HAUL

One well-known baggage system specialist that has already signed up as a launch member of the Green Baggage

Alliance is Beumer. It points to the quality and longevity of baggage systems as key to reducing airport carbon impact. Its first ICS (Individual Carrier System) at Munich Airport is still running after almost 30 years, with energy-saving upgrades instigated using leaner energy motors whenever components are replaced, using a condition-based maintenance regime.

"No matter if you're a small or a big airport, the way that the processes are in an airport, how they actually use their equipment, how much equipment is installed, and how it will be maintained and operated – these factors all determine the environmental footprint," says Per Engelbrechtsen, Beumer's Business Development Director.

Beumer's CrisBag ICS solution sorts, stores and carries passenger baggage to the aircraft by means of individually-controlled radio frequency identification device (RFID)-equipped 'tote' containers throughout the complete baggage handling process, from check-in to early baggage storage (EBS), in-tote



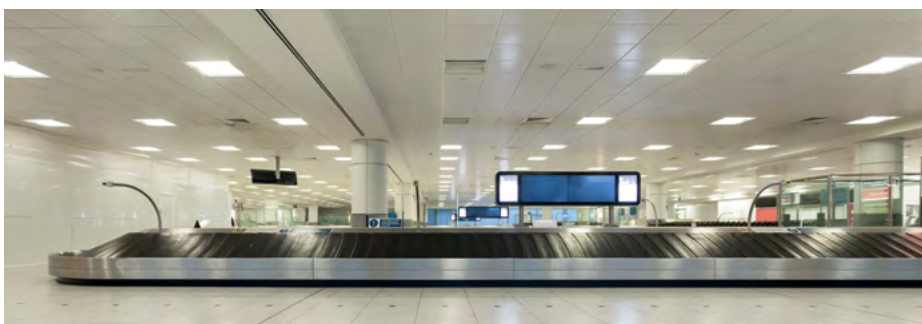
Pack your bags

Gleaning data on the dimensions, shape and proportions of baggage opens up opportunities to optimally position the quantity of suitcases that can be crammed into the LD3 containers which are then loaded into the holds of passenger aircraft.

BagsID conducted trials using this 'Tetris' type approach while loading LD3s on an Airbus A350-900 (which can carry 22 containers — 12 of which are typically used for carrying passenger luggage). After testing on over 15 flights it was demonstrated that 3 LD3 containers could be saved and redeployed for revenue-generating cargo.

"It also means that you can be smarter with your load and balance on the plane," says BagsID's van der Meer, whilst noting that loading each container took a bit over 20 minutes compared to eight minutes. The upside, he says, is that "freight is often lighter than passenger baggage," citing the fact that much of Schiphol Airport's outgoing freight is "flowers, which don't weigh that much – so that saves a lot of money of course, and it also saves a lot of flights."

Road to nowhere: the days of energy inefficiency in baggage handling are coming to an end.





A lot of airports have peaks throughout the day. And in between, although they're running low baggage volumes, many of them are operating their entire systems – they're just burning off energy.

Per Engelbrechtsen, Business Development Director, Beumer

screening, sorting and transportation to discharge.

One of the system's features is an energy-saving adaptive tilt mechanism which monitors upstream and downstream baggage flows, autonomously switching between static and dynamic tilt for baggage discharge, reducing stress to components and lowering energy consumption during off-peak periods.

"A lot of airports have peaks throughout the day. And in between, although they're running low baggage volumes, many of them are operating their entire systems – they're just burning off energy," reveals Engelbrechtsen. "So how could your strategy be to make sure you put things to rest, so you lose as little energy as possible?"

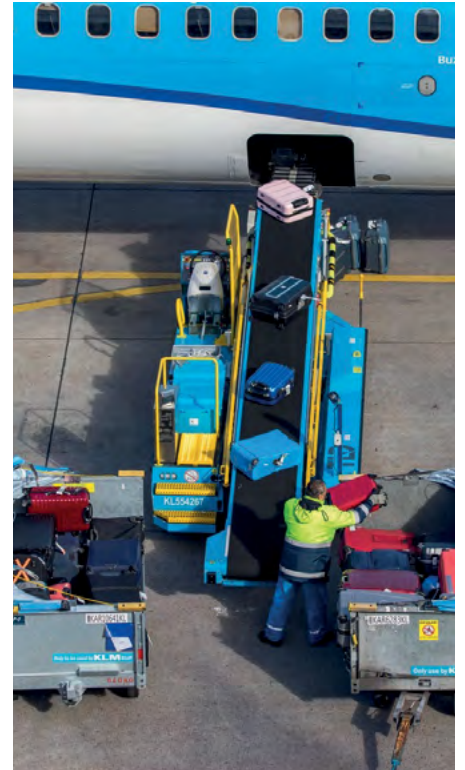
Hence, the CrisBag system uses a network approach whereby there is more than one route from A to B, meaning

that elements that are not required for each specific bag go into sleep mode, using standby power.

"We're not running the motors all the time, only starting them when needed and that automatically reduces the power consumption and increases the lifespan of the motors, thereby consuming less energy and wearing out as few spare parts as possible," claims Engelbrechtsen.

WHAT THE FUTURE HOLDS

As with all of aviation's climate impact initiatives, time is of the essence. The Green Baggage Alliance's aspiration, says van der Meer, is that five years from now "we would like to have approximately 90 airports being completely covered with virtual tag technology." By that point, he estimates that BagsID will have built up a "dataset of 2 million bags annually – approximately 40% of the market."



Hold it: with technology-based solutions such as CrisBag and BagsID on the up, how long before printed bag tags are obsolete?.

And by the end of this decade, van der Meer expects that AI-powered visual baggage identification will be the dominant technology, thereby rendering printed baggage tag barcodes obsolete – and potentially saving those 300,000 trees every year. ■

