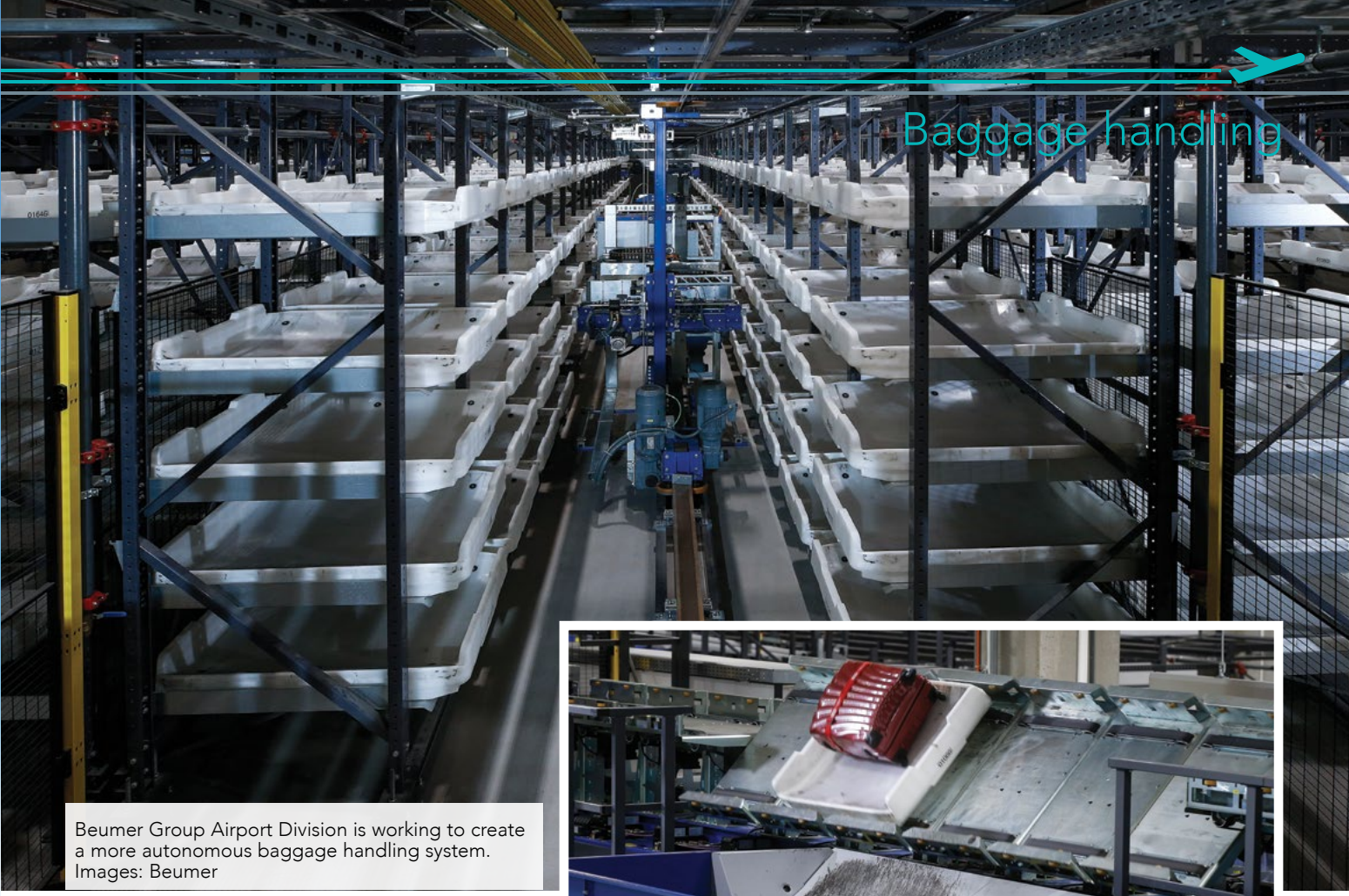

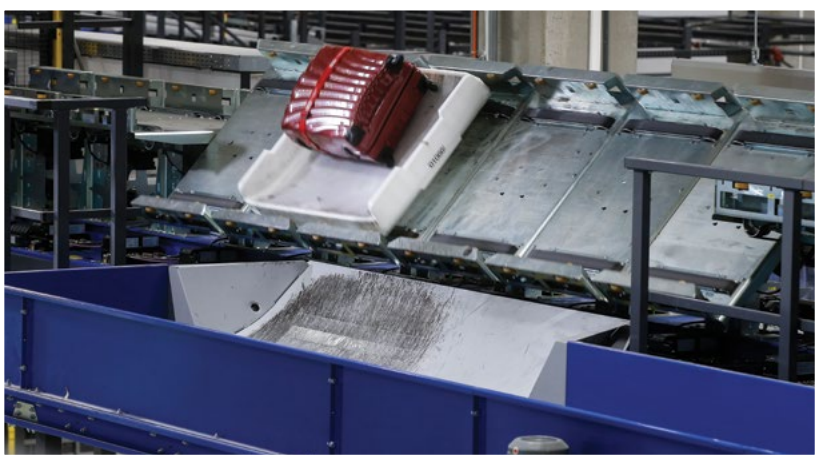

Beumer Group Airport Division is working to create a more autonomous baggage handling system. Images: Beumer

Bags of new ideas

Real-time baggage tracking, robotics to assist with lifting and loading/unloading of heavy luggage, and wearable scanners. Paul Sillers reports on the changing landscape of baggage handling.

The global airport baggage handling system (BHS) market is on a trajectory of steady growth.

According to a recent report by Spherical Insights & Consulting, the market was valued at USD 9.2 billion in 2023 and is projected to grow at a compound annual growth rate of 3.68 per cent, reaching an estimated USD 13.2 billion by 2033.

This growth is driven by rising passenger volumes, investments in airport infrastructure, and the integration of cutting-edge technologies.

"Quick adaptation [of baggage handling processes] to deal with fast-rising passenger numbers is what the industry urgently needs," Borry Vrieling, the founder of Eezeetags BV, based in the Netherlands, tells *Regional Gateway*.

For regional airports, he says, one approach to address baggage handling capacity constraints is to "simplify the tagging process in a self-service environment in a way that a first-time flyer can tag a bag".

Vrieling continues: "By empowering the passengers in the end-to-end self-service bag drop process, we take away the need to have a 1:1 check-in/bag-drop agent at the airport.

"There will always be staff around as a service, but 95 per cent of all passengers can go through the process without assistance. This saves the airport, the airline and the ground-handler a huge number of staff, which, in times of staff shortages can be a blessing.

"We see a definite trend towards 'off airport drop-off' at hotels, casinos, amusement parks, and home luggage pick-ups. In this way also the infrastructure at the airport can work with central insertion points taking away the actual bags from the terminal building, speeding up the passenger process."

Power Stow launched the Tail Loader at the end of last year as an ergonomic lifting device aimed at bridging the gap between the belt loader and a baggage cart. Image: Power Stow

ROBOTISATION AND PROCESS INNOVATION

Per Engelbrechtsen, the Business Development Director at Beumer Group Airport Division, says: "In baggage handling we see a trend towards making the baggage handling system, the Operations & Maintenance team set-up and the software and data tools overlap to create a more autonomous BHS."

Passenger numbers, he says, are finally on a par with 2019 and there is a trust in the continuous growth forecast. The missing operational capacity and the struggle to source enough manpower means that the airport industry has more interest in innovation.

"We meet more and more airports that want more automation for baggage handling. This means more robotisation in the baggage make-up, more focus on process innovation and more trust in decision science, letting AI and data tools assist in making informed operational decisions."

For Engelbrechtsen, Bergen Airport in Western Norway is a good example of how a regional airport has succeeded with integrating baggage operations focusing on "baggage on demand" based on Beumer's Independent Carrier System (ICS) technology, CrisBag, and the tote-based CrisStore system.

The BHS "pulls" baggage through the system in response to downstream demand and alerts the operator when there are 40 bags ready in storage to be sent to make-up for the same flight.

"ICS BHS has long been thought of as only for large hubs," says Engelbrechtsen, "but we have successfully installed the technology with smaller system designs in regional airports because they too have the need to create operational and staff efficiency, to deal with capacity demands and difficulties in staff sourcing."

ICS, he adds, also allows the ground handler to plan the loading process more efficiently and reduce the number of sorting bins/destination chutes which gives the airport a more compact footprint for the system.

"It also helps establish environmental goals to minimise energy consumption and the total cost of ownership and enables the airport to enhance passenger satisfaction by offering the flexibility to check in early."

DATA DASHBOARDS AND ANALYTICS

At Bergen Airport, to meet operational and environmental goals, the airport implemented Beumer Group's "pull-based" BHS. The implementation, developed by Avinor and Beumer Group, features customised data analytics dashboards to provide predictive maintenance insights, operational recommendations and automatic alerts for abnormalities, thereby reducing the need for manual monitoring.

These analytics enable the team to enhance efficiency, allocate resources effectively, and improve system availability, benefitting handlers, airlines, and the airport alike by lowering costs and smoothing operations.

Bergen Airport's BHS features two CrisBag sorting loops which can handle 3,500 bags per hour, with in-tote ECAC Standard 3 security screening.

The system is complemented with Beumer's CrisStore Early Baggage Storage, which holds 600 bags with on-demand retrieval, allowing batch preparation for speed-loading and scalability for future needs.

INCREASED PRODUCTIVITY

According to Power Stow, automated solutions that assist human operators are becoming increasingly prevalent in the BHS space.

The company launched its Tail Loader at the end of last year as an ergonomic lifting device designed to bridge the gap between the rear end of a belt loader and a baggage cart or ULD.

It's wide operating range provides exceptional flexibility, allowing baggage handlers to eliminate the need for lifting when transferring bags between the belt loader and the baggage cart, reducing the physical strain on baggage handlers and minimising the risk of injuries.

Christian Søeberg, Power Stow's CCO, says: "Throughout the development and testing phases, we gathered feedback from multiple airports and ground handling teams. This collaborative approach allowed us to develop a product that incorporates various input from those who are working with the tool every single day and we were able to

> **"With many airports worldwide facing challenges in recruiting and retaining baggage handling staff, an ergonomic tool like the Tail Loader can quickly make a positive impact in daily baggage handling operations."**
>
> Christian Søeberg, CCO, Power Stow

design an intuitive, user-friendly and efficient solution."

Emphasising that manual baggage lifting and handling are the main risk factors for work-related musculoskeletal disorders among baggage handlers, often leading to injuries, absenteeism and increased costs, Søeberg adds: "With many airports worldwide facing challenges in recruiting and retaining baggage handling staff, an ergonomic tool like the Tail Loader can quickly make a positive impact in daily baggage handling operations."

The Tail Loader's innovative design supports a one-person operation at the rear of the belt loader while maintaining or even boosting productivity.

It was also a natural progression from Power Stow's Rollertrack solution, which is mounted at the front of the belt loader to transport luggage in or out of an aircraft's cargo hold.

Søeberg says: "Designed to work at the rear end of the Rollertrack, the Tail Loader is designed for baggage loading and unloading of all narrowbody aircraft.

"When not in operation the Tail Loader retracts fully on to the belt, thus requires no additional space and is fully compliant for airports of any size."

Noting that the response from ground handlers has so far been "extremely positive", Søeberg adds that the overwhelming feedback is that they are grateful to have a reliable, responsive tool which helps reduce their workload. ■

Lending a hand with wearable tech

München, Bayern-based ProGlove is a designer and manufacturer of wearable barcode scanners that are mounted on a lightweight glove, enabling baggage handlers to use both hands when handling awkward and cumbersome items such as skis or musical instruments.

Talma, a leading Latin American airport services company servicing over 40 airports in the region, has been using the ProGlove wearable scanners, finding that it improves baggage loading and unloading efficiency by 50 per cent.

These gains enabled Talma to transform two-person tasks into one-person operations, freeing staff for other critical roles and optimising overall operations.

Clemens Zunk, Chief of Staff at ProGlove, tells *Regional Gateway*: "What Talma saw was that they could scan 100 pieces of luggage in 100 seconds instead of 180 seconds.

"There are two very common integrations with our wearable scanners. One is a gateway, which talks to a warehouse management system at an airport. The other integration path would be via a mobile phone using 5G.

"At the airport, it's likely that the ramp worker has a mobile phone in their pocket, because it's hard to ensure Wi-Fi coverage if a worker is under the wing of an aircraft out on the field."

With the deployment of ProGlove at Talma there were three goals, says Zunk.

"Volatility in the baggage handling – they wanted to ensure that the baggage handling activity peaks would be less steep, and that they can cover those better. Secondly, the aim was minimising processing errors. And thirdly, ergonomics for workers, because running around with a scanner gun is not good ergonomically, especially when trying to handle bulky heavy luggage with broken labels at the same time."

ProGlove has also showcased a demo version of an integration between its wearable scanner and an Apple Watch Ultra – an alternative interface to the mobile phone integration.

Zunk says: "We did that because we see that American carriers typically start somewhere in the cabin, typically in the cockpit, then migrate iOS and the cabin, then to the gate and then under the wing. Apple wants to go there – they're quite close with us trying to work out solutions and integrations."

ProGlove devices, along with other products in the ProGlove portfolio, also have an Inertial Measurement Unit built in. This enables detection of movement data which can be used to monitor and improve health and safety in the workplace.

"Our mission," says Zunk, "is putting people first for a safe, healthy and hyper-efficient workplace."