

VANDERLANDE

AV solutions and developments

Product Director
Autonomous Baggage Handling Solutions

January 2024

MOVING YOUR BUSINESS FORWARD

About Vanderlande

Established
in 1949




>9,000
employees


Warehousing



Many of the largest
global e-commerce
players and retailers



- Woolworths
- Albert Heijn (part of Ahold Delhaize)
- Zalando
- Walmart

€2.1 billion
revenue




Airports

>600
Airports **12** of the
world's top 20



>380
passenger checkpoint
lanes worldwide



- Orlando International Airport
- London Heathrow Airport
- Hong Kong International Airport
- Amsterdam Airport Schiphol
- Istanbul Airport



Global market leader



Innovative
systems



Intelligent
software



Life-cycle
services



Parcel

>52 million
parcels sorted
every day



5 largest parcel
and postal
companies

- UPS
- DHL
- FedEx
- SF Express
- DPD

Company strategy



VISION

“Our vision is to be the worldwide leader in sustainable automated logistic solutions.”



MISSION

“We improve the competitiveness of our customers through future-proof logistic process automation”



SOLUTIONS

“Provider of end-to-end integrated (baggage handling) solutions”

FLEET

Vanderlande's flexible and sustainable baggage logistics solution using autonomous vehicle technology and intelligent software enabling seamless handling of individual bags and load units

Apron

Batch

Bag

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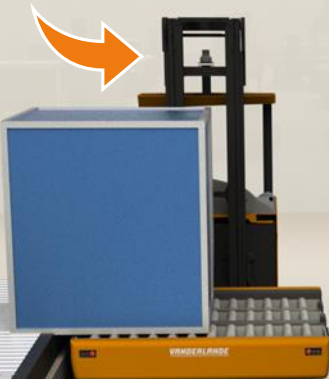


FLEET Batch

Automating the load unit handling inside the baggage basement

- › Automatic transport and storage of load units (i.e. containers)
- › Works with multiple load unit carriers (ULD, loose)
- › Works seamlessly with BAGLOAD and tug and dolly operations
- › Replenishment of empty load units for efficient flight build
- › Extraction of full load units for in-time aircraft delivery

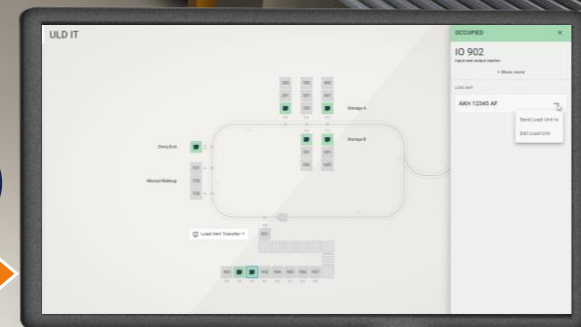
Autonomous transport vehicle



Storage



VIBES (ULD)



Tug-and-dolly interface



FLEET Batch

Innovation Partnership at Avinor

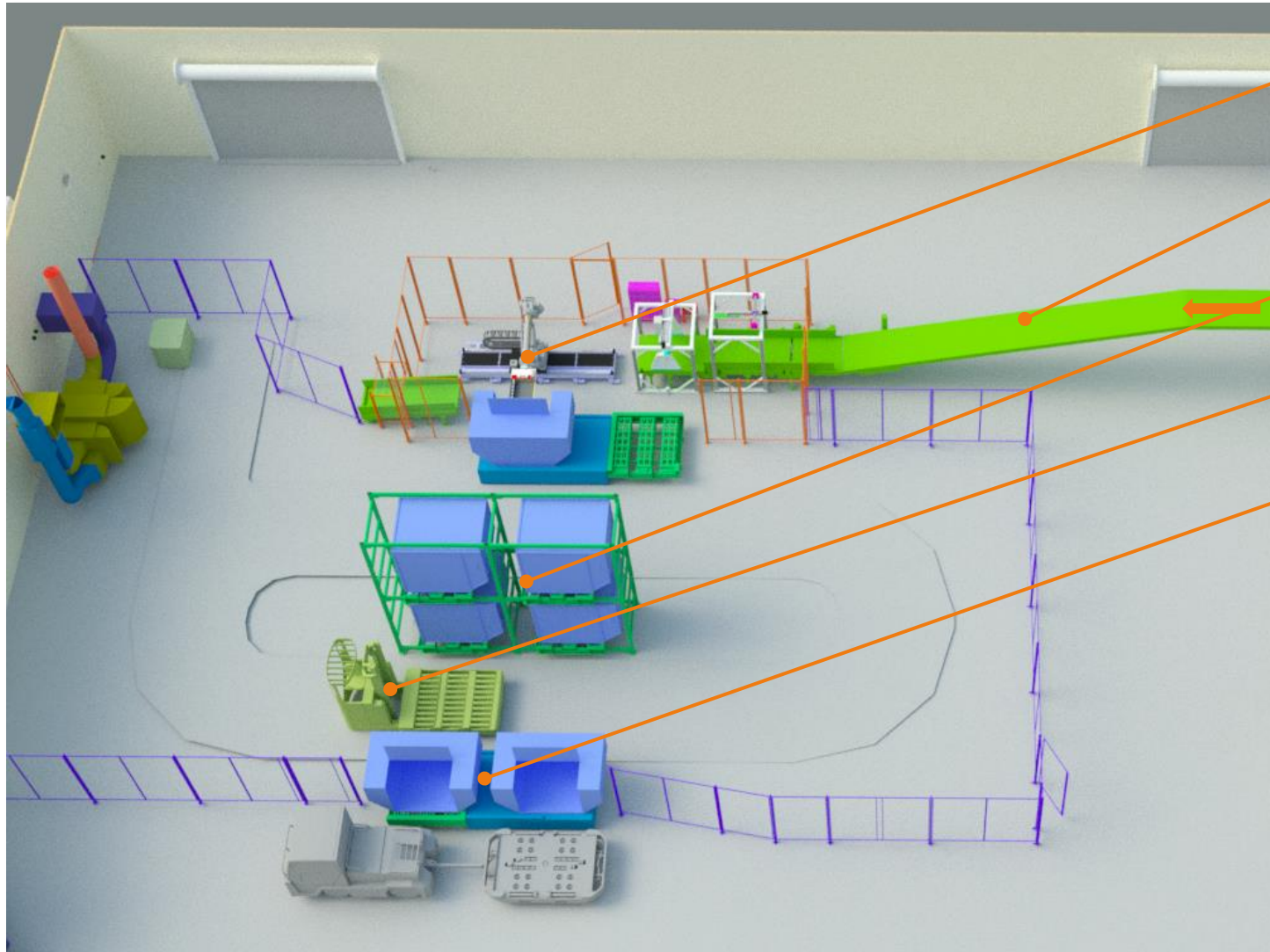
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Vanderlande and Avinor join forces to explore last- mile baggage automation

Vanderlande and airport operator Avinor have formed an innovation partnership (IP) to explore ways of fully automating the last mile of the baggage handling process. Vanderlande will supply two innovative solutions – **BAGLOAD** for integrated robot loading and **FLEET Batch** for the transportation of ULDs. These solutions will be trialled at Oslo Gardermoen Airport in Norway. The ultimate goal of this partnership is to enhance the efficiency and reliability of baggage handling, benefiting the airport industry as a whole.



Innovation Partnership at Avinor: Scope



› Robotic loading by **BAGLOAD 2.0**

› Connection to the **OSL Terminal 2 BHS**

› 4 container **storage positions**

› Automatic indoor transportation by **FLEET Batch**

› Tug-dolly **transfer station**

FLEET Apron

Automating the load unit handling between the baggage basement and the aircraft stand

- › Airport-wide control software to automate the baggage handling processes
- › Provides monitoring, control and process optimization of baggage and load units from a single application
- › Supports the **transition** from current manned operations to future hybrid mix of manned and autonomous operations
- › supports **multiple AGV suppliers** and types, with preference for Toyota brand

BrightSky Mobility Fund

Define, specify, and develop and validate a secure automated solution to handle baggage to and from the aircraft (using emulated environment)



FLEET Apron

到着便搬送パターン

Towards an autonomous airport in 2050

Vanderlande's contribution

- › **Apply knowledge and expertise in designing and delivering solutions for automating logistic processes**
- › **Exploit knowledge and expertise in autonomous vehicles from Toyota Industries**
- › **Define impact on current handling processes and view on possibilities for process improvement**
- › **Provide fully automated baggage handling solutions, from bag drop to the airplane**

Current challenges

- › **Technical maturity and adoption of autonomous driving in current operational conditions**
- › **Regulations and insurances**
- › **Stakeholder field**



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