



# Smart Hospital Logistics

## Challenges & Solutions

# Did you know...?

- At Rigshospitalet in Denmark, waiting around 20 min for an elevator is “normal” for patients and visitors
- At the same hospital, management confirms that in average **a porter** spends **1 hour per day** waiting in front of elevators
- With 420 porters working 200 days/year... → 10% spend handling beds, 8,400 hours used only for waiting → **4 FTE's!**
- At Karlstad Hospital (SE) nurses spend up to 4 hours per shift to “....pick and distribute items...”
- Introducing automated storage solutions saves up to 90 % space – with a building cost of + 5.000 EUR/m2, very short ROI

At the same time free-up capacity in elevators and more time for porters, nurses etc. to patient related work

# Bringing the well-known benefits from the industry into Healthcare



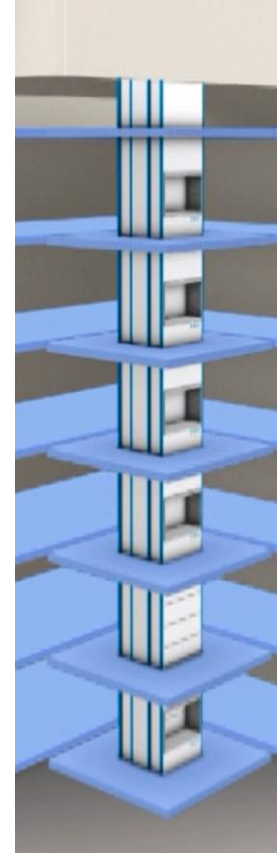
# The beginnings... – and reasons why

- Supplies to different floors and wards
- A hospital contains **many small stocks** spread over the entire hospital – to always have something nearby
- **Each ward orders to their own stock** which creates multiple stocks of same products within the same hospital
- This creates **unnecessarily high stock levels...** and when it's empty in my stock, where do I find something
- The inbound goods must be **delivered to all ward stocks**. After unpacking, the waste is brought back again
- **Goods transport operated in elevators** that should have been used for patients



# Storage of Supplies

- All supplies handled in a **central storage** accessible from all relevant floors
- Wards can have access to all material within the central storage
- No need for wards to have their own safety stock → a much **lower total stock** can be held
- FIFO and full traceability
- All goods are **unpacked** in the logistics department and stored directly into the central storage
- **No transportation of goods or waste through elevators**





# Bed Storage

- Handling beds and larger equipment
- Often placed in corridors or in the basement far away from where they are needed



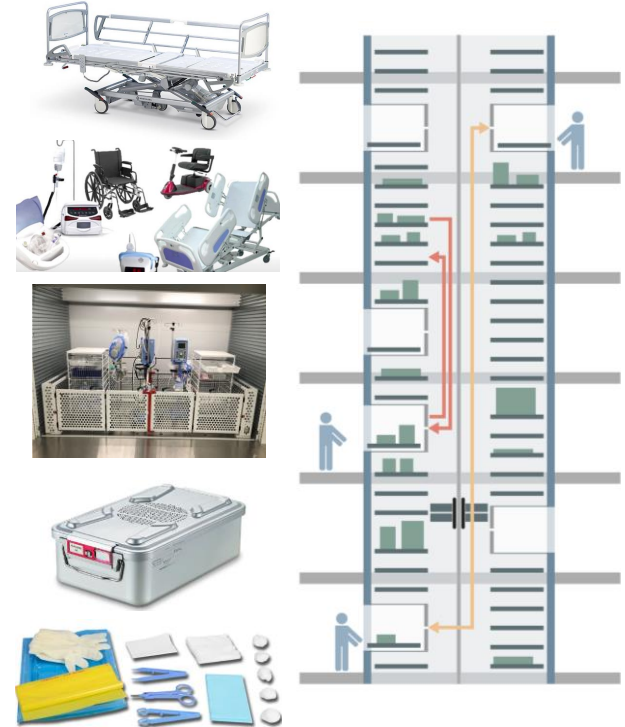
# The Bed Storage solution: VLM Shuttle with floor even loading

- **Specially developed bed trays** adapted to handle different sizes of beds
- Able to load and unload through **front and rear side access openings**
- After beds have been made and cleaned in the washing area, the beds are **stored** in the units and are immediately available
- A bed is delivered to the ward in **one minute** instead of waiting 15 min for a porter being available to bring it via the public elevators



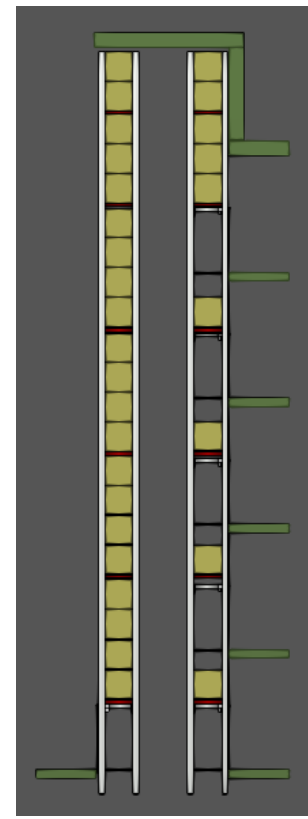
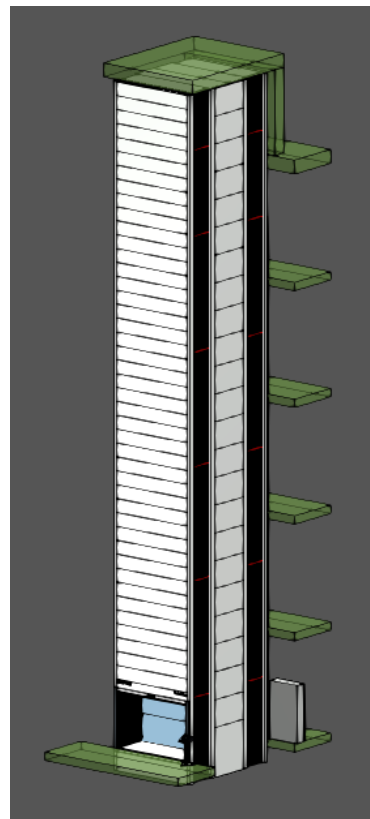
# Hospital Application

- Preferred unit type: VLM Shuttle
- Main features:
  - Shuttle up to 60 meters (more to come...)
  - Access opening on floor level
  - Multiple access openings (up to 12 are possible)
  - Modular special equipped trays
  - Partly charging functionality on trays
  - Speed roller door
  - Hospital design
  - Easy load/un-loading
- Optional:
  - clean room or hygienic environment





## Storage Unit VLM01





## Advanced solution with Software support

# Interfacing to WMS or Hospital-systems



# Interfacing to WMS or Hospital-systems







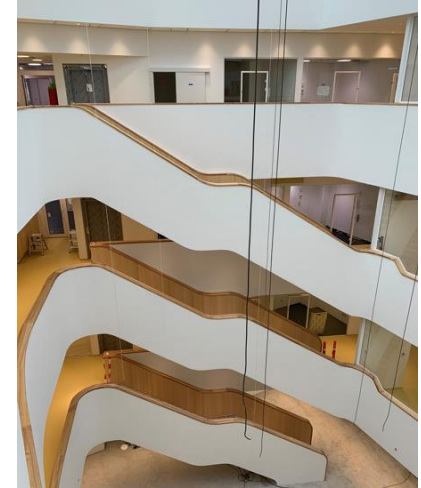
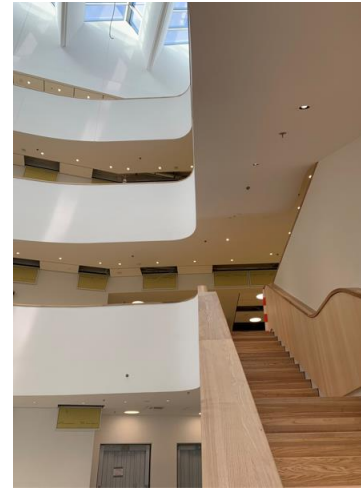
# Some realized projects



# Realized Projects

## Torshavn Hospital | Faroe Islands

- Modern Architecture requires modern Logistics Solutions
- 2 bed units + 1 supply unit. 20,5 m



# Realized Projects

## Karlstad Hospital | Sweden

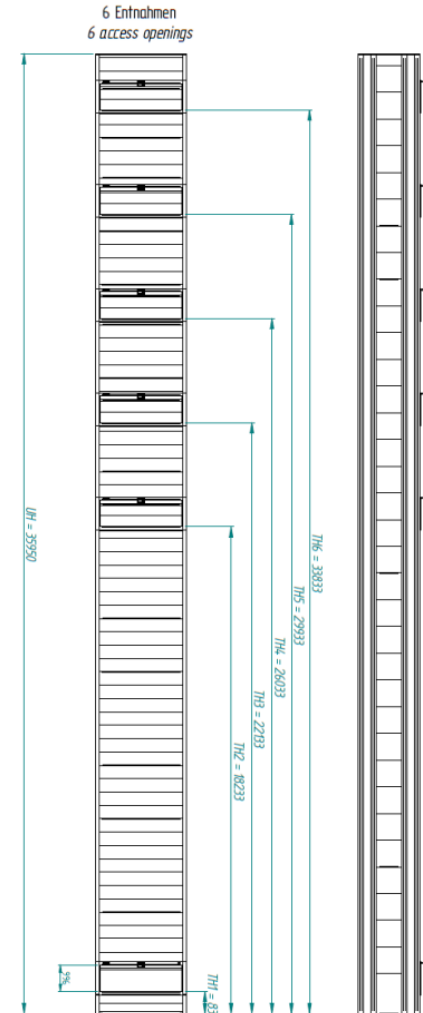
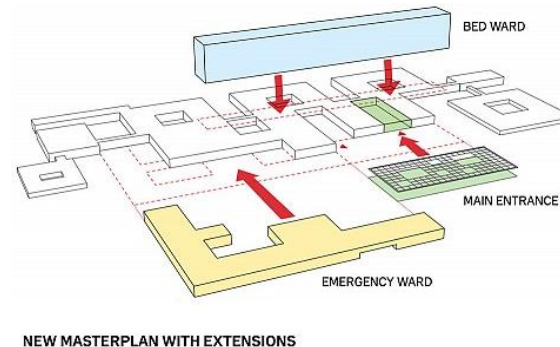
- One Shuttle for supplies to different floors
- Height: 25 m
- 5 access openings
- Goods receive, unpacking/storing from the basement
- Picking from different floors
- Power Pick Global Software



# Realized Projects

## Kolding Hospital | Denmark

- Two Shuttles for supplies to different floors
- Height: 36 m
- Each 6 access openings
- Goods receive, unpacking/storing from the basement
- Picking from different floors

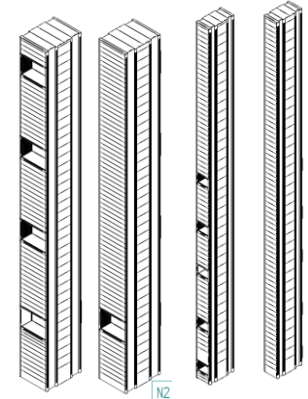
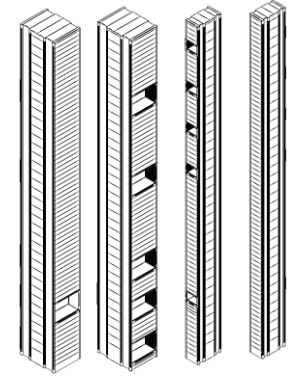




# Realized Projects

## Children's Hospital | Finland

- 2 Shuttles for supplies to different floors
- 2 Shuttles for beds and other large equipment
- Each unit 5-6 access openings
- Unit heights up to 38,5 m
- Power Pick Global Software



# References

## Links

- [Case Study: Karlstad](#)
- [Hospital Logistics Made Easy: Save Time, Space & Costs with Kardex](#)
- [Case study: Optimized warehouse and logistics in the New Children's Hospital with Kardex Shuttle](#)
- [Hospital Logistics | Climate and Cleanroom Storage | Kardex](#)
- Warehouse Insights – Hospital Logistics



Adobe Acrobat  
Document





# References

## Links

- [Welcome to our Virtual Showroom | Kardex](#)




# About me...



## Thomas Larsen, MBA

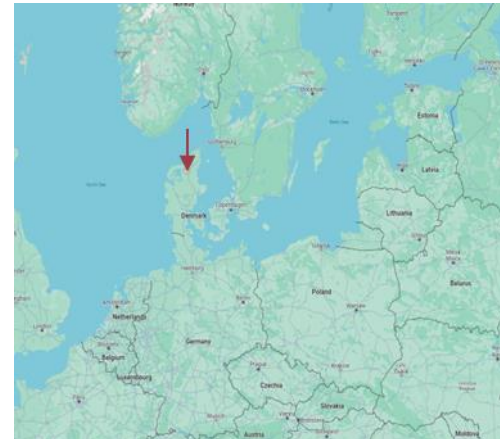
Director Business Development  
Hospital Logistics

 [thomas.larsen@kardex.com](mailto:thomas.larsen@kardex.com)

 +45 23 74 17 18

 [www.linkedin.com/in/thomaslarsen/](https://www.linkedin.com/in/thomaslarsen/)

- 52 years old, living in Denmark
- Worked 25+ years in the Healthcare Sector and Public Tender environment
  - Swisslog Healthcare (10Y)
  - Siemens Healthcare (10Y)
  - Engineering/Planning Hospitals (6Y)
- Since 01/24 working for Kardex as global responsible for Hospital Solutions



Tak for opmærksomheden !

**Thomas Larsen**

Director Business Development  
Hospital Logistics



thomas.larsen@kardex.com



+45 2374 1718



[LinkedIn | Thomas Larsen](#)