LMAD

Enabling the future of delivery

Last Mile Autonomous Delivery

Finnish-Estonian Collaboration and Business Forum
30.3.2023

Social and Industrial challenges

Urban impacts of transport & deliveries

- Accounts for an average of 33% Co2 and 25% greenhouse gas (Ademe)
- Deliveries are rising with a 20% CAGR (10 to 15 billion parcels 2020)
- Account for 50% traffic congestion and 20% street occupancy (Ademe)
- 500 000 death in the EU due to air pollution (EU envir. agency)

Industry delivery challenges

- E-commerce deliveries are sharply rising, and cities are restricting city center access to delivery vehicles
- Shortage of delivery men & drivers
- COVID-19 saw a surge in contactless deliveries and a shortage of delivery men
- Delivery cost of drivers are rising (~ 40% of the last mile)
- More and more autonomous delivery bots in operations in the US & Asia, will also disrupt the EU industry

=> Value chain and process operations are changing

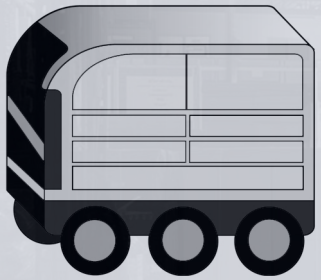
LMAD integrates with 3rd-party robots

Planned robots in the future

Larger robot for carrying palettes:
1.2 x 0.9 metres

Doors open with space inside for larger palettes.

Medium robot for smaller parcels:



Different sized lockers for different types of parcels.

Smaller robot for mono delivery:

Ideal for meal delivery

Prototype robots on field

Current robotics partners: TwinswHeel, GIM

Possible new providers: CLEVON

LMAD as a Platform

LMAD offers an all-round solution which aims to reduce costs and improve Last Mile Delivery services

Platform

A software platform managing and optimizing fleets of autonomous last-mile delivery robots

Fleet Management

Managing, scheduling and dispatching of AV fleets, robot-agnostic - integrating any delivery robot

Delivery Optimisation

Deliveries are pooled and optimised to match the delivery time-slots with the least used resources (robots, driven km, time, CO2, etc.)

End-consumer experience

Interactive messaging and delivery tracking interface for end-consumers, with easy-to-use pick up interaction and strong proof of delivery

B2B logistics integration

Communication interface directly connecting to retailers' web shops and / or logistics companies' existing parcel management

Delivery

Best fitting robot

AGV Fleet

LMAD platform is robot-agnostic, integrates various modular robots to satisfy varying delivery needs

Use-case:
Logistics

LMAD deployments

France:
Corporate campuses

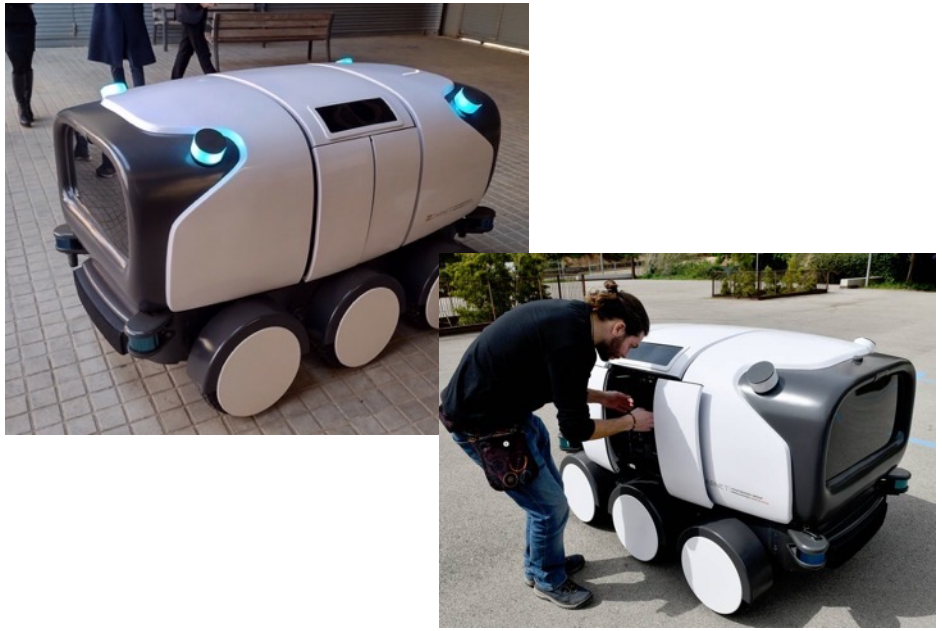
- Nokia & Sodexo: From pilot to industrial & commercial solution since 2020, continuous operations
- EDF campus deployment 2021 Q2 onwards; logistics & surveillance

Finland:
Urban zones

- Q3 2020 – Grocery delivery from K-Market in Otaniemi (Youtube video)
- Q4 2020 – DB Schenker / Smart city-hub experiment in Helsinki (Youtube video)
- Q2-Q4 2021 – DB Schenker “virtual pickup points” in larger public zone in Helsinki (Youtube video)

LMAD deployments

Spain & Hungary: Autonomous Delivery Device

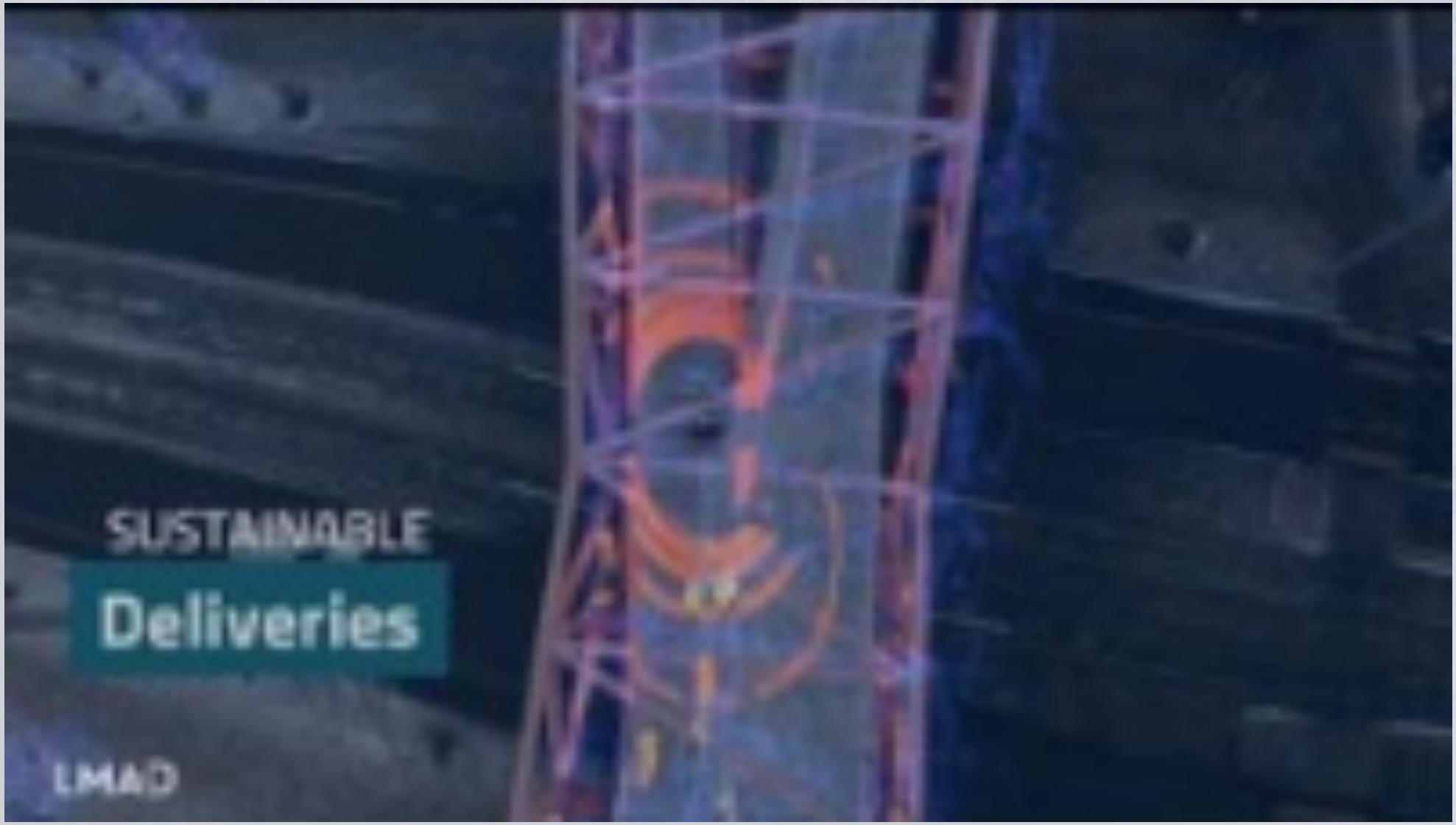


- Autonomous Delivery Device, Ona
- Mixed autonomy, mainly sidewalk, but can drive on-street
- Takes over last mile / meters to final recipient

Germany: Autonomous Hub Vehicle

- Autonomous Hub Vehicle, Pluto
- On-street autonomy in mixed traffic
- Carries consolidated shipments from outside of city center to meet ADDs or couriers

LMAD operations in Helsinki – “Virtual Pickup Points”



Next up – Horizon EU URBANE project

The Helsinki "Living Lab" focuses on testing various autonomous last-mile delivery use-cases over 2023 & 2024 to:

- showcase how the number of vans and trucks can be decreased in the city center/densely populated area
- demonstrate collaboration between major logistics operator(s) jointly with innovative start-ups
- to test the use of ADVs in last-mile logistics
- to test the concept of micro-hubs in last-mile logistics
- to decrease emissions in the city
- to offer flexible and innovative delivery services for the citizens

B2C parcel deliveries

B2B larger deliveries

***B2B(2C) on-road** (Clevon – TBC)*

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