


IPIC 2023

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# 5G&AI enabled services in Port operations tailored to logistics and safety applications


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# About 5G-LOGINNOV

**H2020-ICT-2018-20: Information and Comm. Technologies**
**Topic: ICT-42-2020**
**Type of action: IA**


### Project aim

5G-LOGINNOV's vision is to optimize freight and traffic operations at Ports and Logistics hubs via innovative concepts, applications and devices supported by 5G technology, the IoT, AI-enabled data analytics, next generation traffic management systems, Cooperative, Connected and Automated Mobility (CCAM)

### Objectives

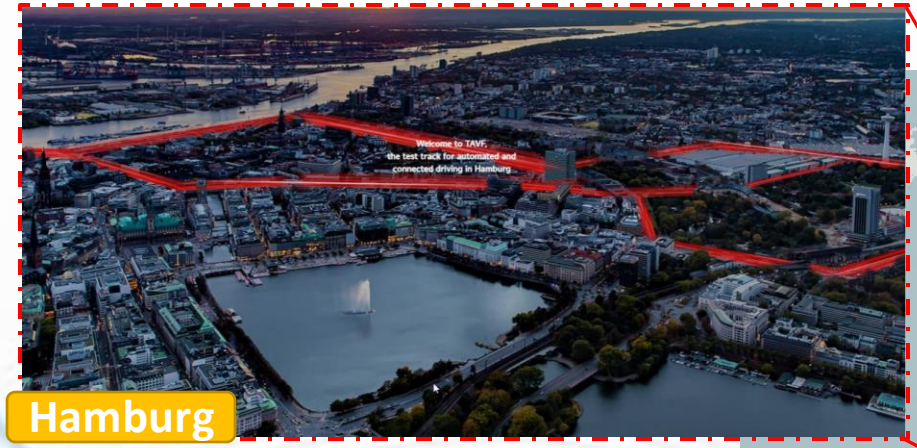
- Improve the efficiency of logistics operations, putting at the centre of attention the sustainability of the logistics supply chain
- Support the "Green" Port Industry vision by reducing the hub's operation emissions
- Enhance safety and security operations

### Expected Outcomes

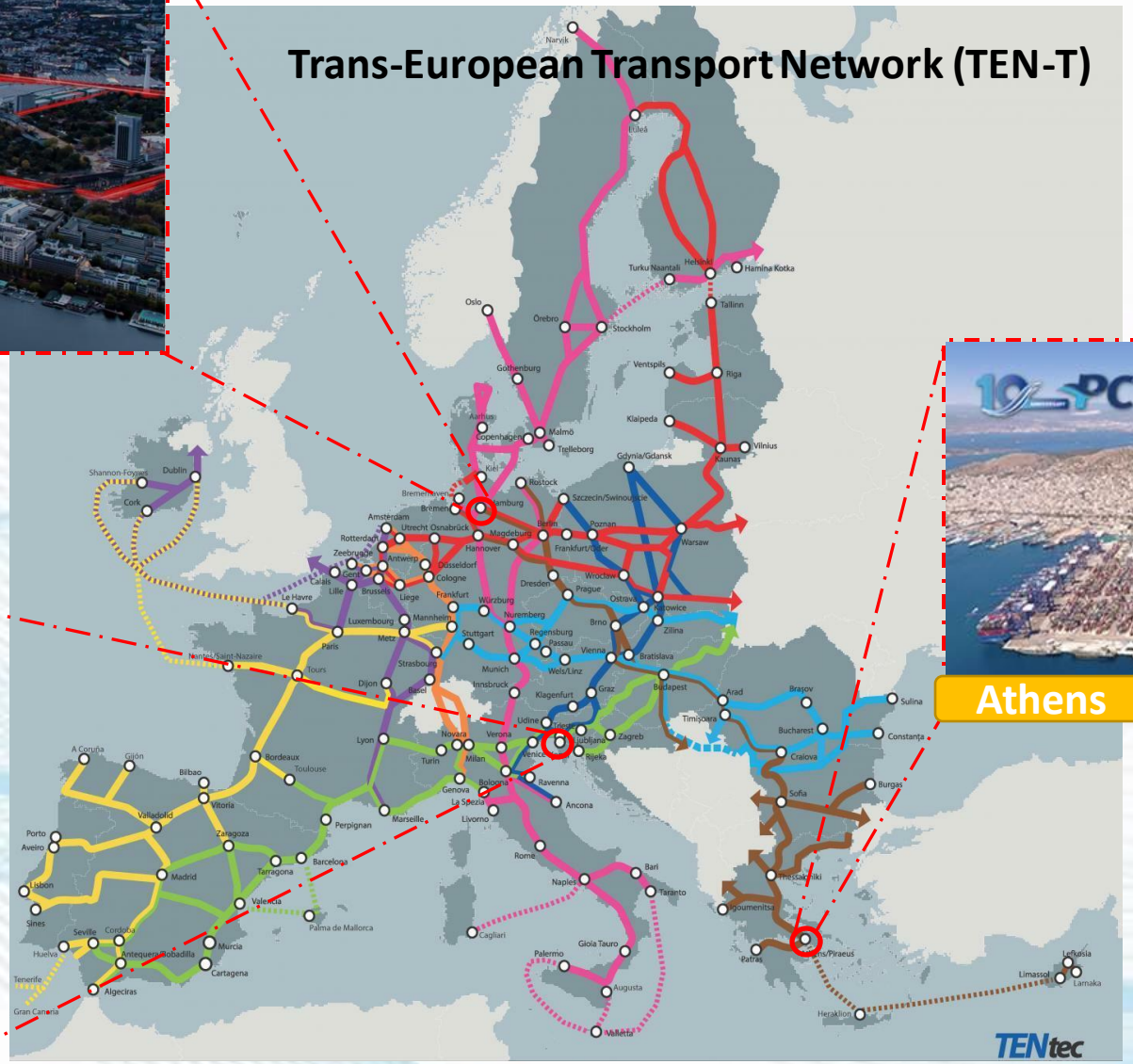
- Improve the efficiency of logistics operations via 5G&AI enabled video analytics services related to port control, logistics and remote automation.
- 5G-enabled low carbon truck platoon mobility management (Green Light Optimum Speed Advisory, GLOSA)
- Involvement of new market actors (e.g., SMEs) in the innovation processes

# 5G-LOGINNOV Living Labs

5GLOGINNOV




Hamburg





Athens

Koper

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# Use Case **Overview** – Athens LL

**Truck Telematics**

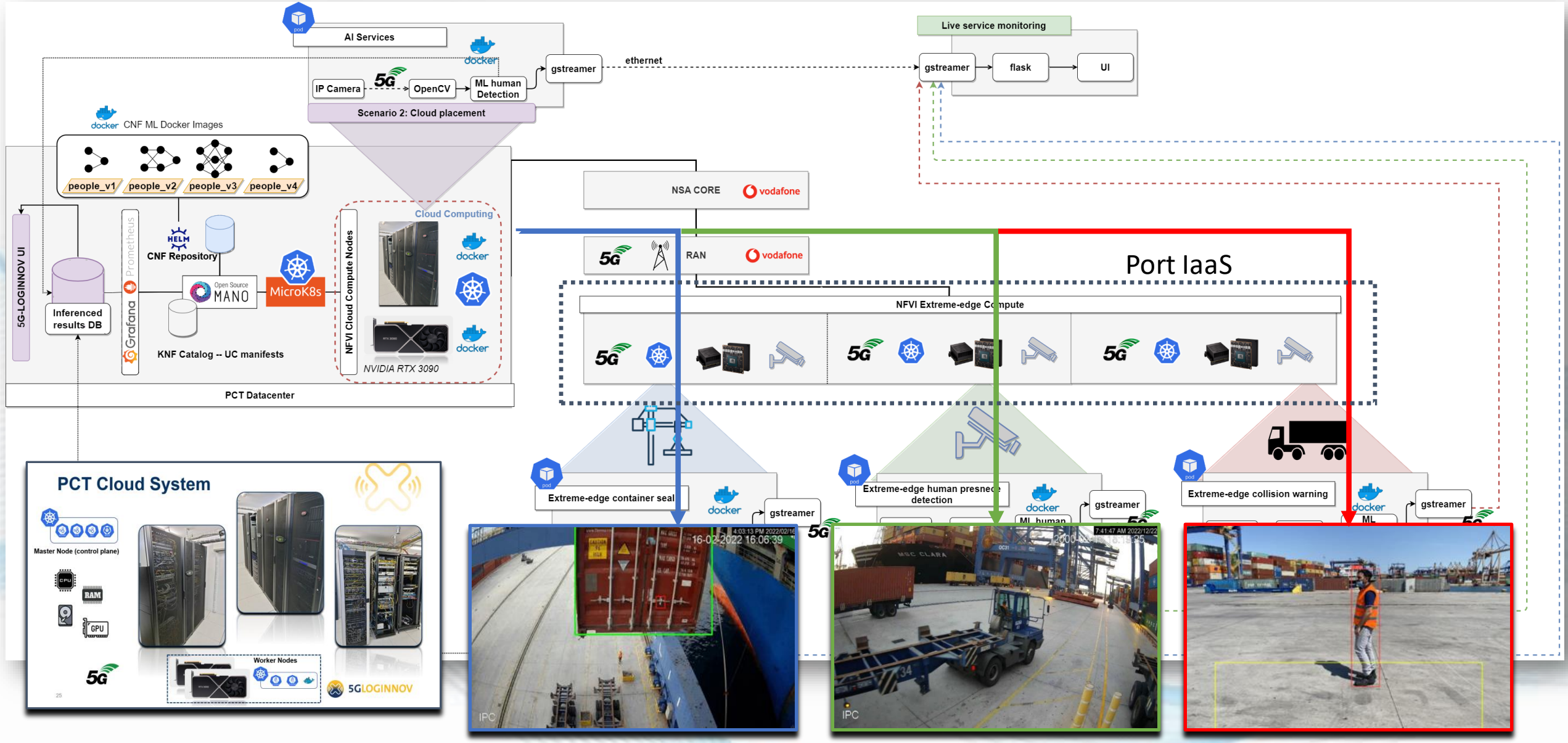
- Truck Fleet Management Platform
- Predictive Maintenance

- 5G&AI enabled collision warning system

- 5G&AI enabled surveillance and monitoring
- 5G&AI enabled container seal detection

**5G&AI video analytics with NFV-MANO support**

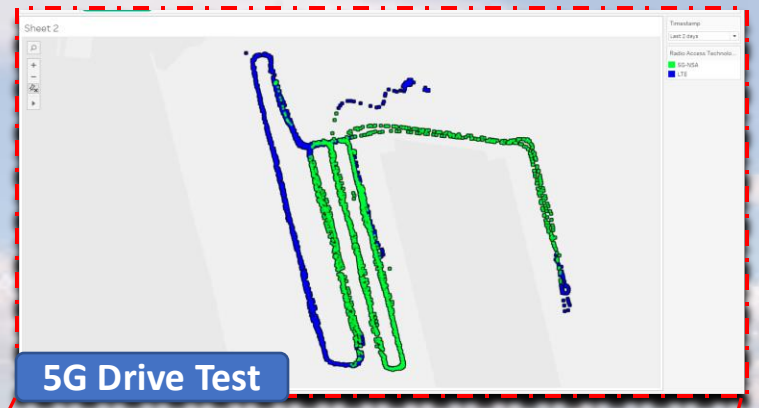
# Glimpse on Architecture & Services



# 5G **Trials** Area - (5G KPIs)

5GLOGINNOV


RRU AAU 5639w




5G Drive Test


DL (peak, avg):
800Mbps, 500Mbps

UL (peak, avg):
150Mbps, 100Mbps


Ping (avg): 15ms

5G

Trials Area

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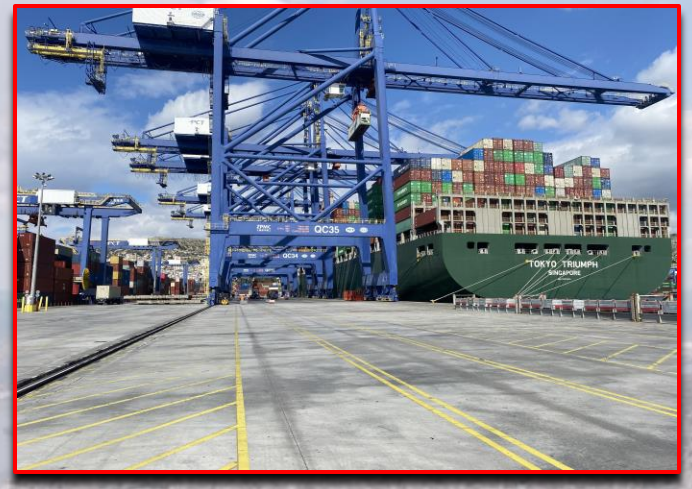
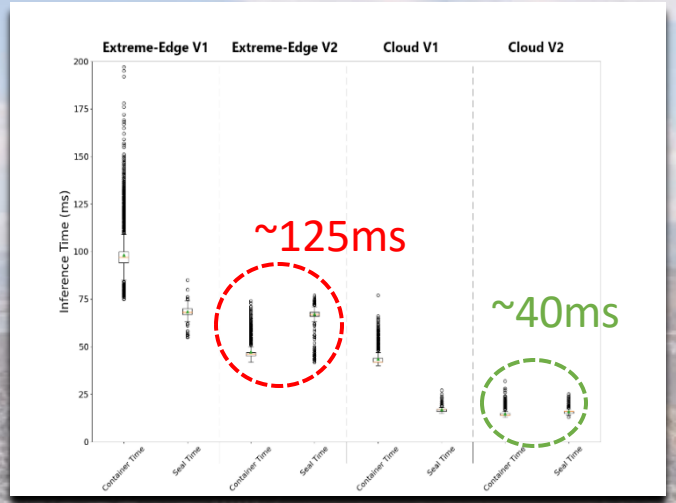
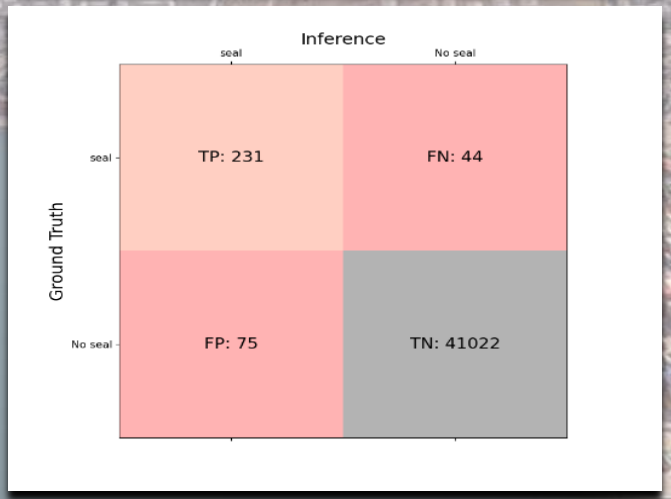
# 5G&AI enabled container seal detection








Training Set: 50K -> 500K images
Validation: 30 hours

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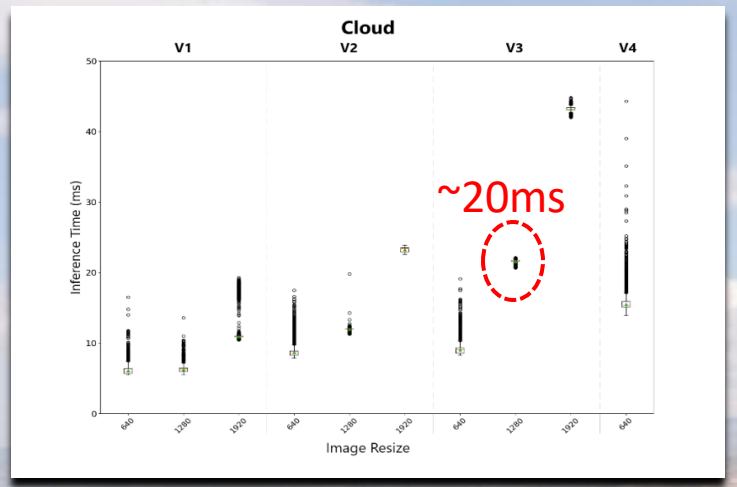
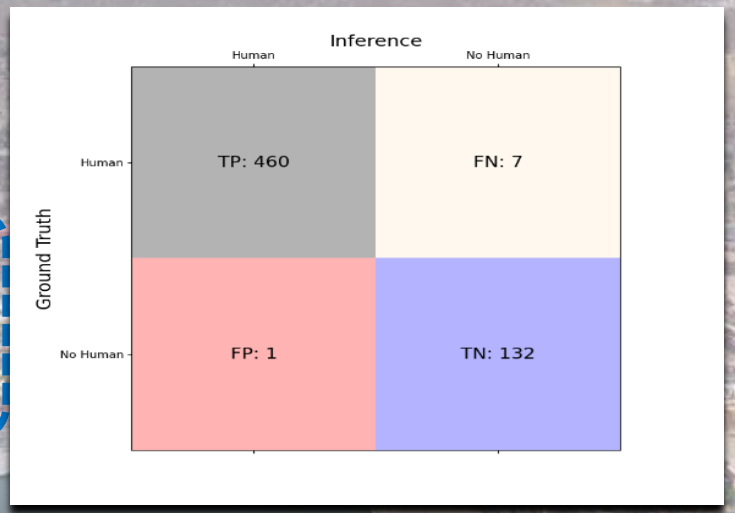
# 5G&AI enabled surveillance and monitoring

Area 1

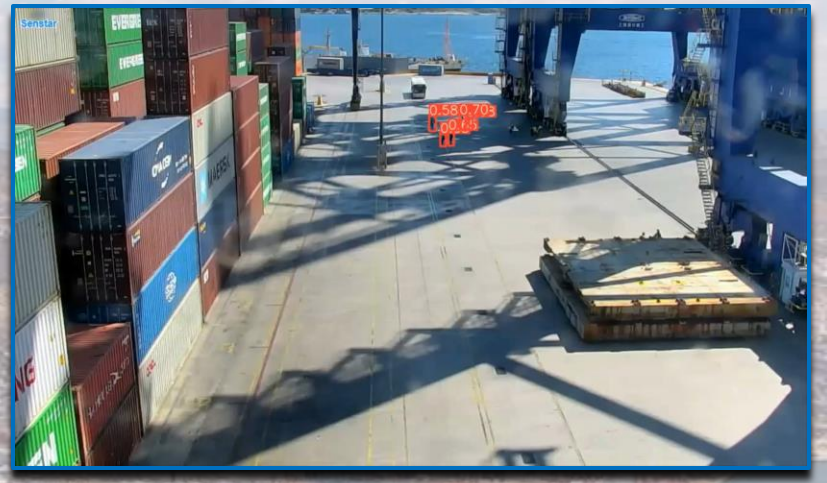
Area 2

Trained Set: 10K Images
Validation: 30 hours







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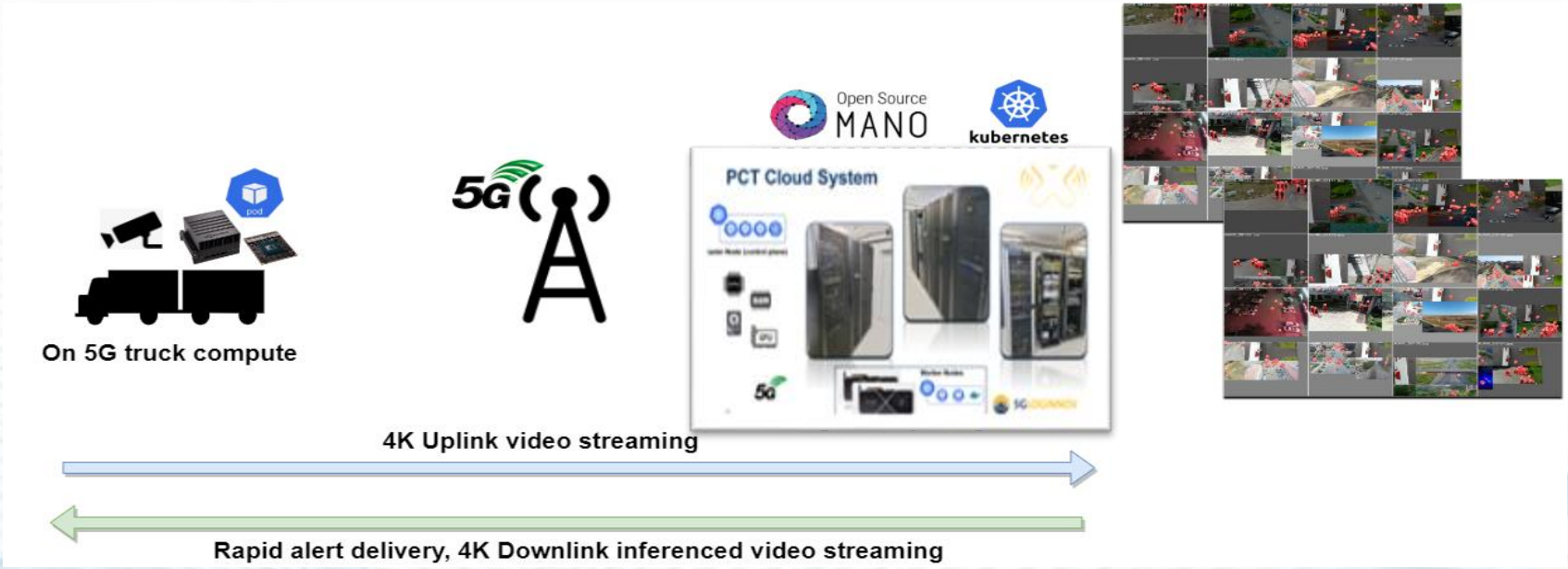
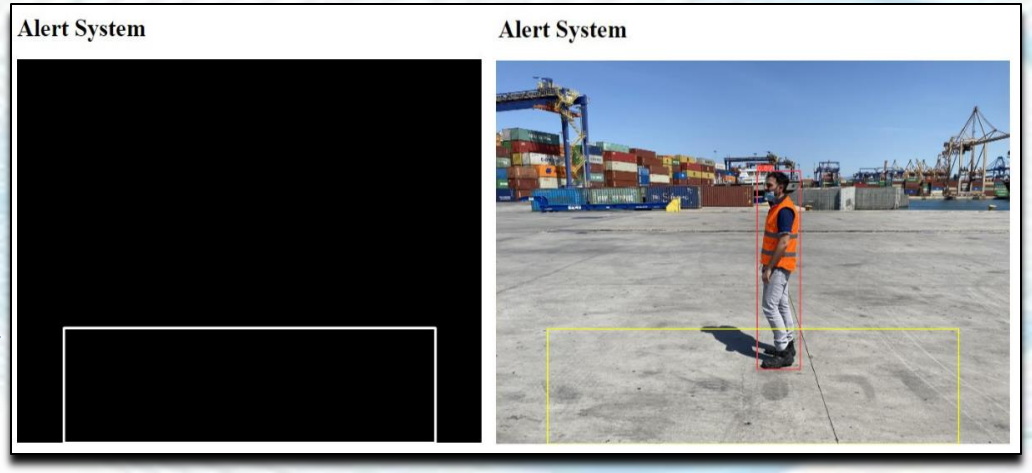
# 5G&AI enabled collision warning system







# 5G&AI enabled collision warning system - cont.

**Truck**

frame

- Frame ID
- Timestamp (t1)


frame

- Frame ID
- Timestamp (t2)

**Cloud**

frame

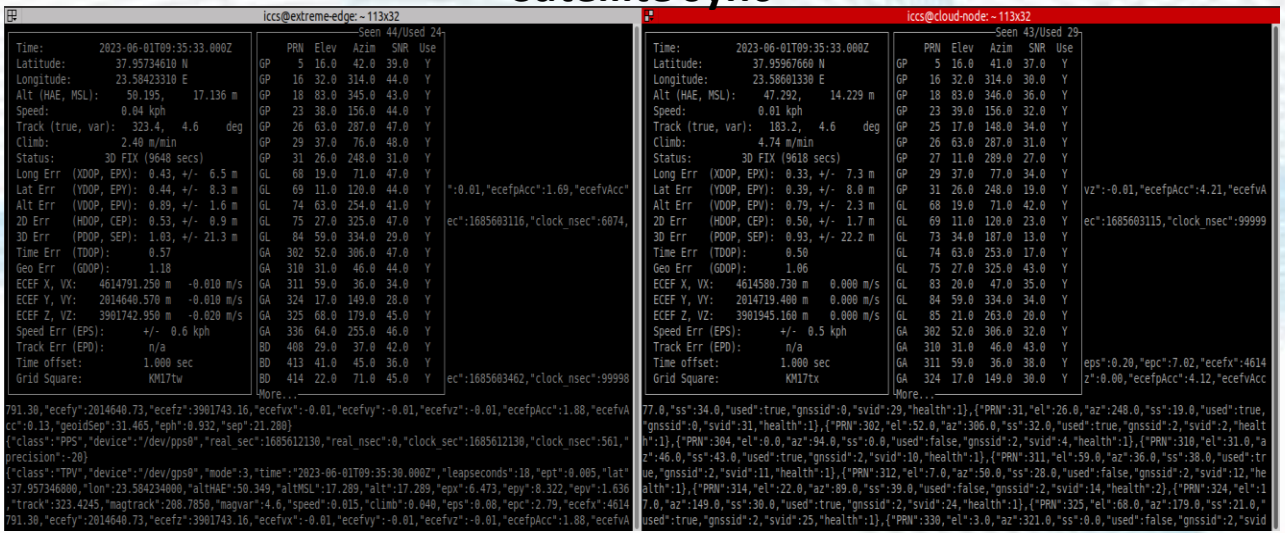
- Frame ID
- Timestamp (t3)

Frame Network Delay (FND)

Frame Processing Delay (FPD)

**Service Delay** = FND + FPD

**Satellite sync**

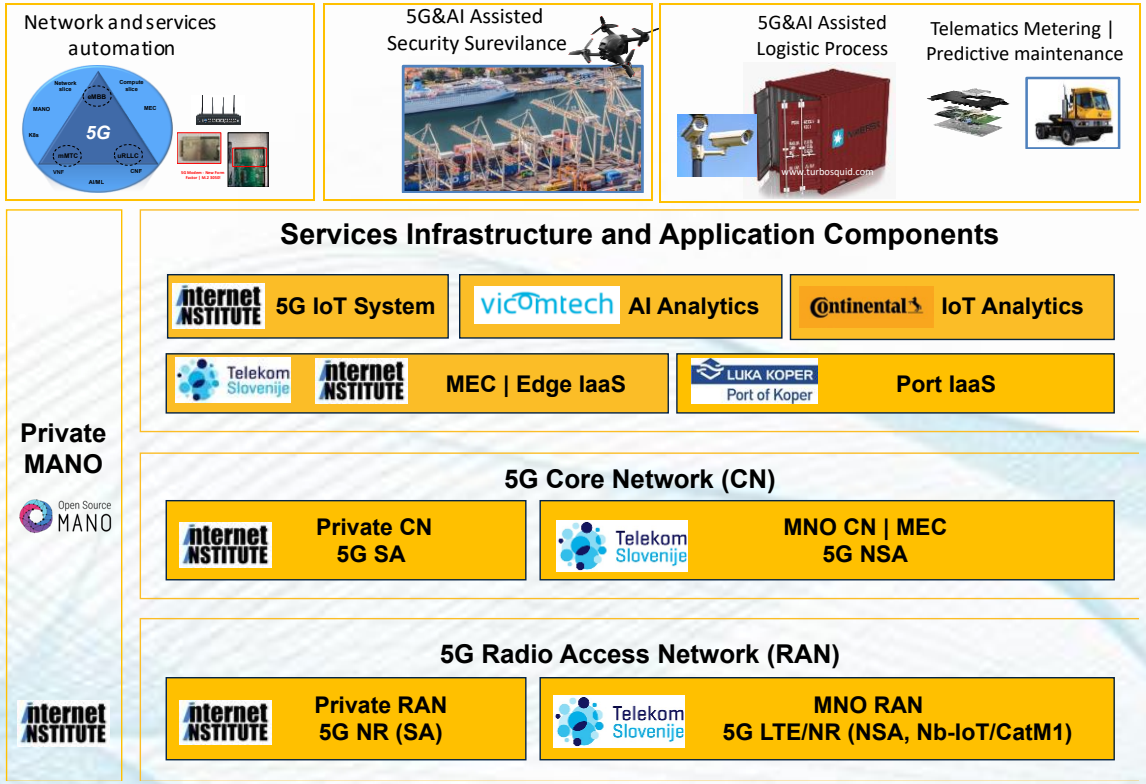


# Predictive Maintenance

- A fleet of about 192-trucks (currently communicating over 4G and 5G)
- Telematics device installed on trucks
  - Telemetry data: CAN-Bus, GNSS, container presence sensors
- Applications
  - **UC7**: AI/ML predictive maintenance services

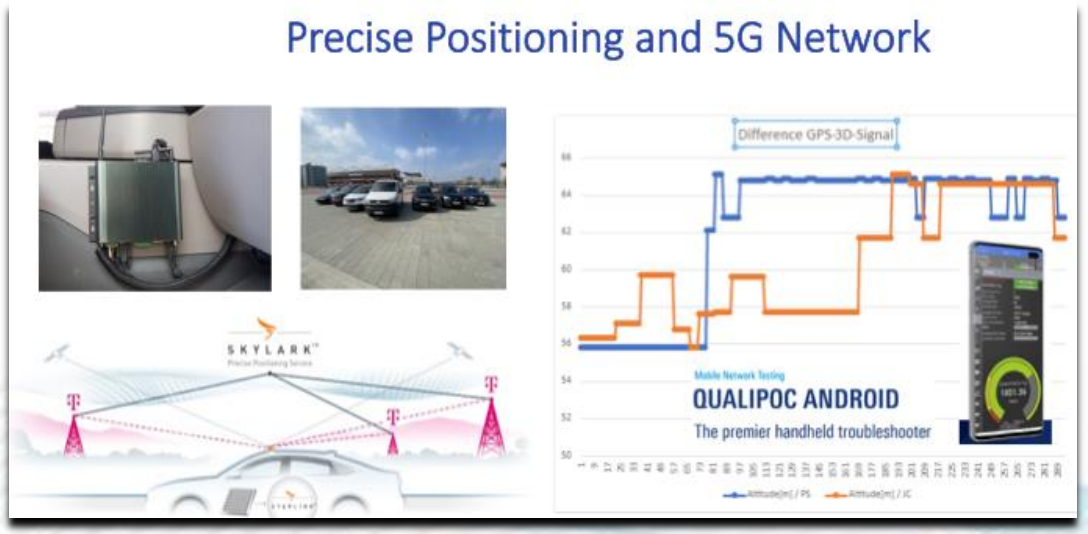
# Koper Living Lab

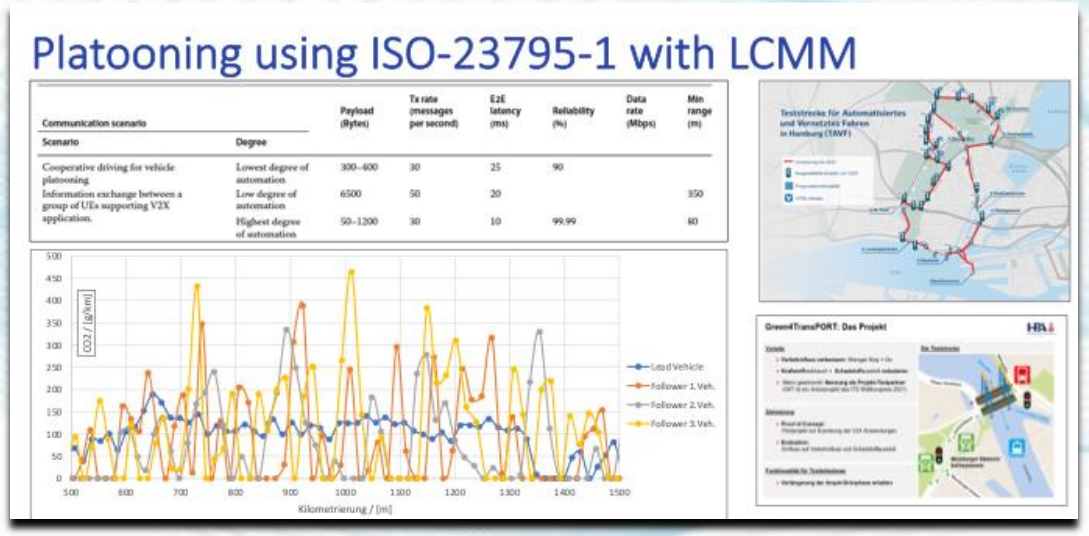





LL Leader: Janez Sterle - INTERNET INSTITUTE Ltd
janez.sterle@iinstitute.eu

# **Hamburg** Living Lab


LL Leader: Willenbrock Ralf, Product Manager, T-Systems

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# Thank you!

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