

# **5G LOGINNOV**

## **Smart Ports Workshop NetworldEurope & CCSA**

**16<sup>th</sup> September 2022**  
**-future enablers for ports-**

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Innovation & Deployment  
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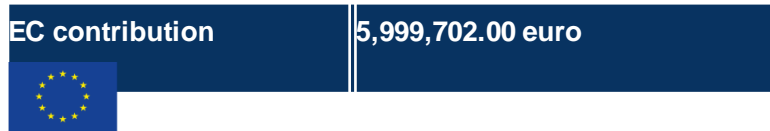


**5GLOGINNOV**

# Project Fact Sheet

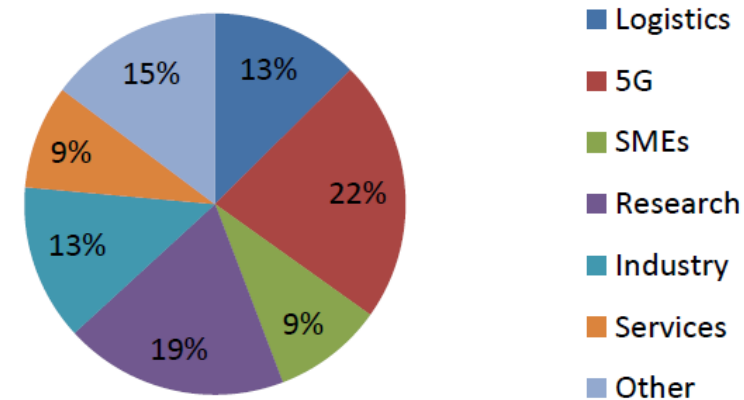


- The H2020 Innovation Action 5G-LOGINNOV has a project duration of 36 months with project start 1<sup>st</sup> of September 2020
- The 5G-LOGINNOV consortium has 15 members from 8 European countries (BE, ES, FR, IT, RO, GR, SI, DE)
- Members represent stakeholders from Logistics, Automotive and Telecom Industry working closely with Infrastructure operators and Research Institutes – SMEs and Start-Ups will be integrated for future 5G market uptake across Europe
- Total budget: 7,926,474.29



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 957400

Per type of partner



**5GLOGINNOV**

# Project partners



# Vertical: logistics industry



## AN OPEN PROBLEM

- **Supply chain efficiency largely depends upon data and information** – how it is collected, processed, stored, updated, interpreted, understood, and exploited.
- **On operational level**, actors need real- time information, to be able to make effective decisions.
- **On tactical and strategic levels**, transportation systems need increased connectivity.
- **Existing systems are currently not linked to each other**, thus missing the opportunity to optimize the performance of their cooperation.
- There is the need of **new solutions for connecting logistics** information systems with different characteristics, intra- and cross-company, for immediate (real-time) exchange of information.



# Vertical: logistics services



Data exchange



Data posting



Risk prediction



E-CMR



Visibility  
services



CO2 monitoring



Port  
services



Data  
sharing



Data collection



Marketplace



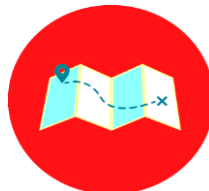
Custom  
services



Control  
Tower



Estimated  
Time of Arrival



Route planning



Data  
management

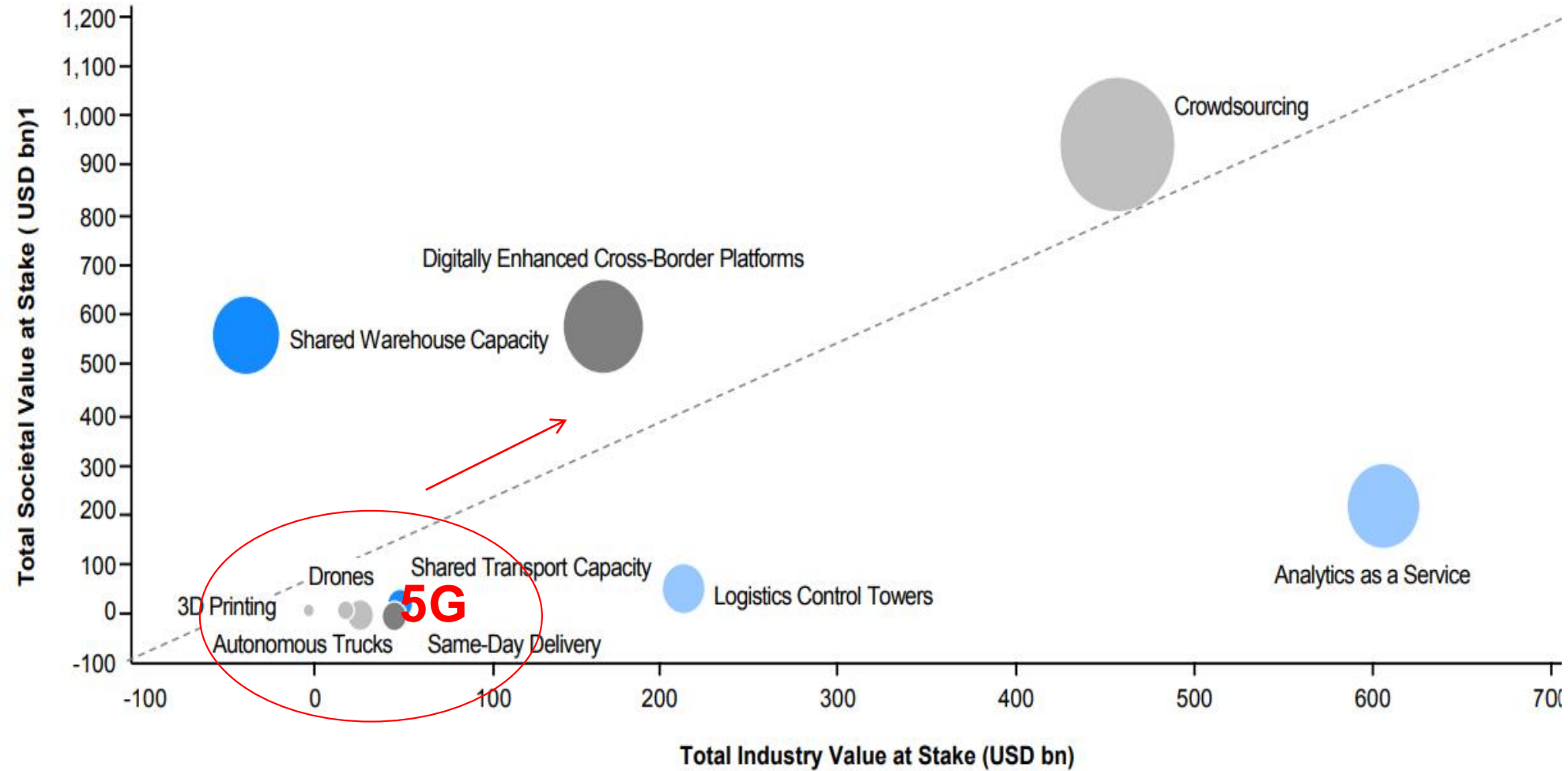


***What else?***



**5GLOGINNOV**

# “Show me the Money” from Digitalisation in Logistics



# Why 5G-LOGINNOV



- ports are essential for the European economy and for economic growth: 74% of goods exported or imported to the EU are transported via its seaports.
- **Cargo volumes** are increasingly **higher**: with an expected 57% rise by 2030 – while they are also **arriving in a shrinking number of vessels**
- Cargo port operators need to comply with **increasingly stricter environmental regulations** and societal views for sustainable operations.
- 5G is the convergence technology for the new generation of mobile networks, expected to be massively deployed starting from 2020.
- **5G promises also to address the diverse and rather demanding performance requirements of a wide range of use cases.**
- 5G-LOGINNOV is supported by **5G technological blocks**: new generation of 5G terminals for future Connected and Automated Mobility(CAM)
- new types of **Internet of Things-5G devices**, data analytics, **next generation traffic management and emerging subsets of 5G networks functions.**
- through 5G-LOGINNOV, ports will minimize their environmental footprint to the city, they will **decrease disturbance** to the local population through a significant **reduction in the congestion around the port**



# *How are deployed new CAD & Logistics*

- 5G-LOGINNOV aims to support the **new generation of 5G-CAD terminals, new type of IoT-5G connectivity devices** through **technical solutions, business models and priority scenarios** by deploying new **CAD and Logistics as a Service** in **real-life port-city areas (Hamburg, Athens, Luka-Koper=intelligent hubs & network optimisation-multi/ synchromodal transport & optimise the logistics network)**.
- 5G-LOGINNOV's central innovation is to build a first-class European industrial supply side for **5G core technologies and new IoT-5G devices** (e.g. slicing, eMBB, uRLLC, mMTC, MEC, 5G-NR) with global market footprints.
- The project will have a strong impact in the **logistics industry**, as the innovative use cases deployed in the three Living Labs will test and evaluate **5G-enabled services during the project**.
- The project has a strong interest in the emergence of new market players, such as SMEs and start-ups, taking advantage of the growing adoption of distributed cloud computing technologies in 5G networks and making possible open innovation at service level in the logistics and Industry 4.0 sectors.
- 5G-LOGINNOV contributes to the emergence of global standards and **globally harmonised frequency bands for 5G** in the context of related developments at the level of global bodies like **3GPP, ITU and 5G standards (Rel. 16/17)**.
- Being part of the third 5G PPP phase implies supporting the development of a "lead" market involving cooperation models with key vertical sectors contributing to the wider policy objectives of industry digitisation in the Digital Single Market.



# AT GLANCE: UCs- enablers for ports



## Piraeus-Athens



## Hamburg



## Luka Koper



### ***Optimal selection of yard trucks***

- Installation of a 5G access point on yard trucks
- e.g., 5G latency, precise localization services, etc.

### ***Optimal surveillance cameras and video analytics***

- Installation of connected 4K surveillance cameras
- AI/ML solution for, e.g., container seal presence, human presence detection, social distancing

### ***Predictive Maintenance***

- 5G access point installed on yard vehicles
- AP will collect and forward in real time with low latency telemetry data over the 5G network

### **5G-LOGINNOV Floating Truck & Emission Data (FTED)**

### **5G-LOGINNOV 5G GLOSA & Automated Truck Platooning (GTP)-**

under 5G-LOGINNOV Green initiative

### **5G-LOGINNOV dynamic control loop for environment sensitive traffic management actions (DCET)**

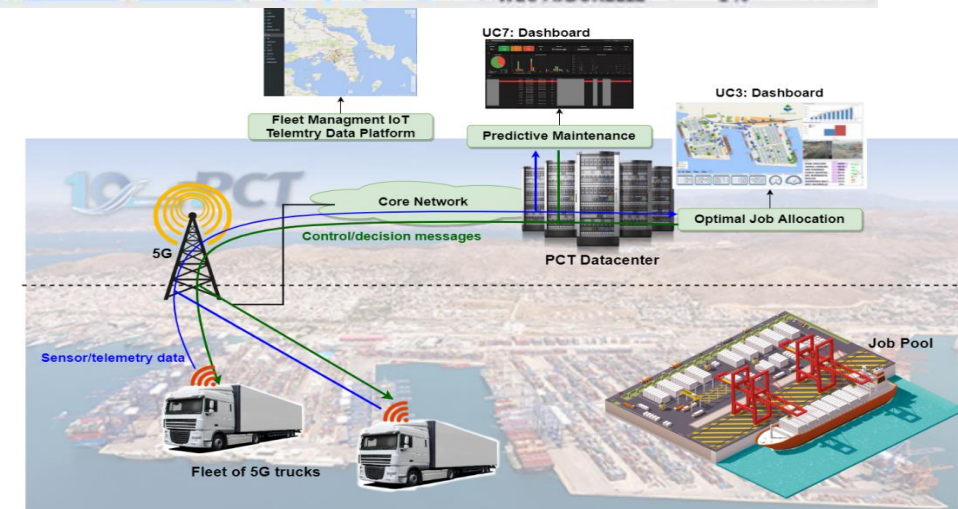
**Port control, logistics and remote automation Management and Network & Business critical and mission critical communications**



**5G LOGINNOV**

# 5G-connected Yard/External-trucks in port operations

- Yard-truck as a 5G-IoT telematics device
  - Data sources: CAN-Bus, localization, other on-truck sensors (e.g., container presence)
  - Applications/use cases
    - Horizontal movement of containers in port operations (between stacking areas and loading/unloading areas for vessels and rail)
    - AI/ML approach for predictive maintenance service
- External truck as a 5G-IoT device
  - Real-time tracking of external assets (tracking, expected arrival, traffic, etc.)

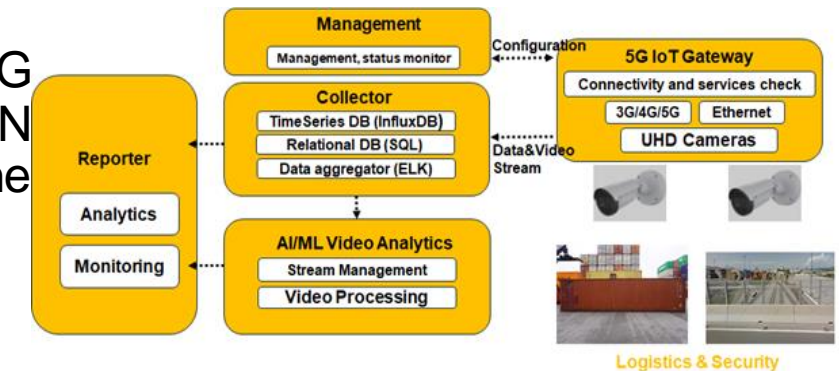
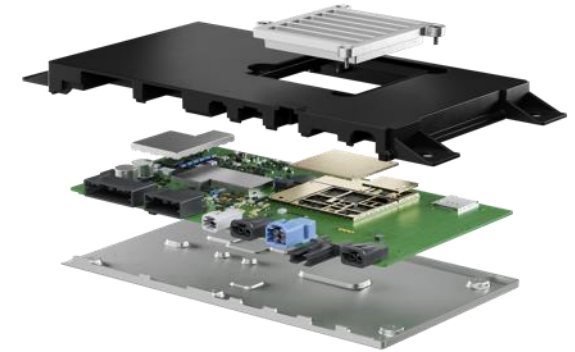




# The 5G-LOGINNOV automation for ports: port control, logistics and remote automation



- **Target 1:** Port control, logistics and remote automation (*port machinery equipped with industrial cameras for transferring images to CNS system | identification of container markers | detection of structured damage*)
- **Target 2:** Port infrastructure monitoring and remote metering with 5G IoT (*operating machine monitoring by means of capturing and transfer of the key information | positions, usage and other telematics metrics from operating terminal vehicles*)
- **Target 3:** resilient 5G based network services (alternative 5G connectivity capabilities to the established operational WLAN network, supporting data transfer redundancy between the operational port infrastructure and the operations centre)



# 5G-LOGINNOV – use cases of Living Lab Hamburg



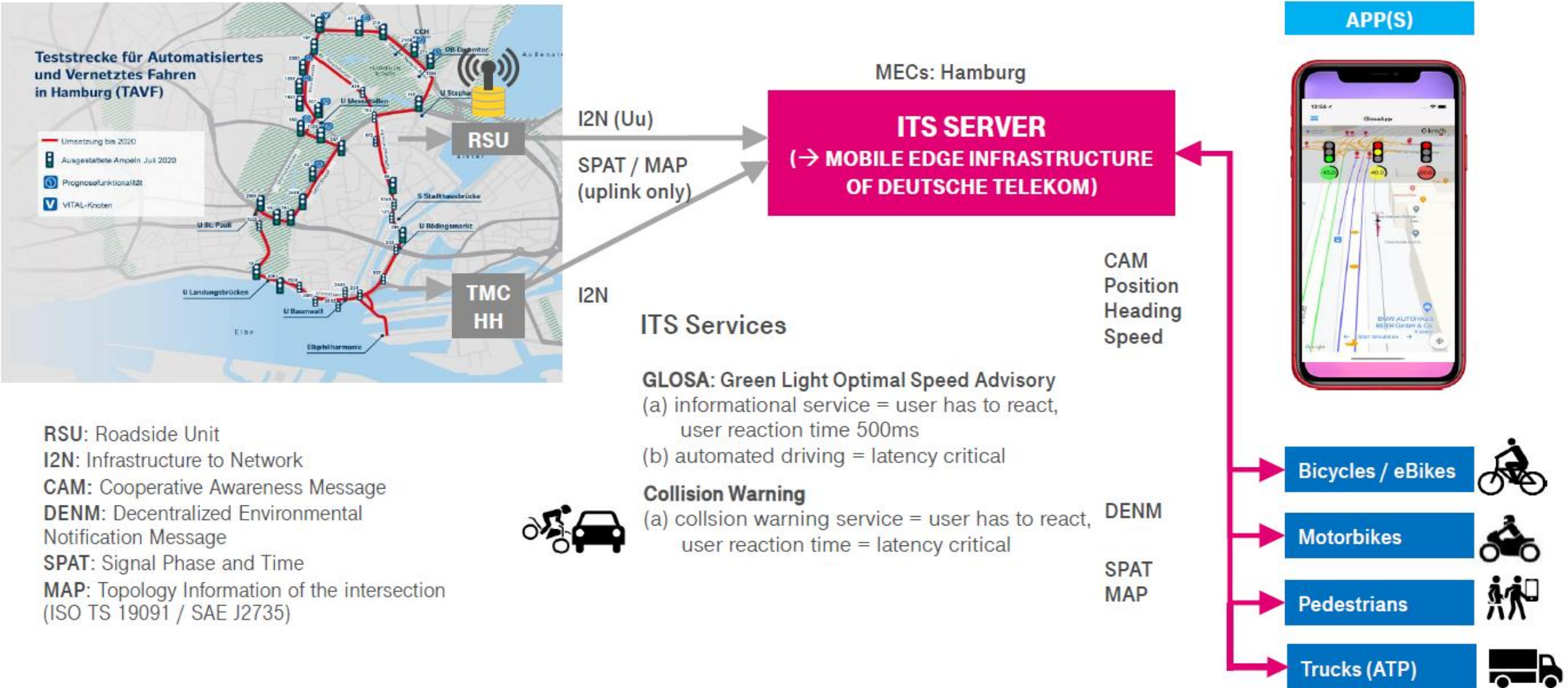
- 1) **Truck & Emission Data for Sustainable Traffic Management** based on 5G V2X in Hamburg
- 2) **Automated Truck Platooning using 5G based GLOSA** in the logistics corridor of Hamburg to **achieve low emission targets** for ports and hub-logistics
- 3) **Data exchange with SWARCO traffic management center.** Dynamic control loop for the reduction of CO2/NOx emissions from trucks by **avoiding Start-Stop events** by using GLOSA technology

With **5G-LOGINNOV**, ports will minimize their **environmental footprint to the city**. They will decrease disturbance to the local population through a **significant reduction in the congestion** around the port.





# How does it work?



**RSU:** Roadside Unit  
**I2N:** Infrastructure to Network  
**CAM:** Cooperative Awareness Message  
**DENM:** Decentralized Environmental Notification Message  
**SPAT:** Signal Phase and Time  
**MAP:** Topology Information of the intersection (ISO TS 19091 / SAE J2735)



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Apps: GLOSA, EnTruck, et. al



vehicle pos / speed data (CAM)



environmental data  
aggregated movement data

Traffic Light Forecast  
(SPAT/MAP)



Service Centre



Virtual  
Traffic Management Centre

Traffic Signal  
State [forecast]

Traffic Management  
Strategy measures,  
vehicle trajectories for  
traffic control

other  
environmental  
data



City Traffic Management  
Centre(s)

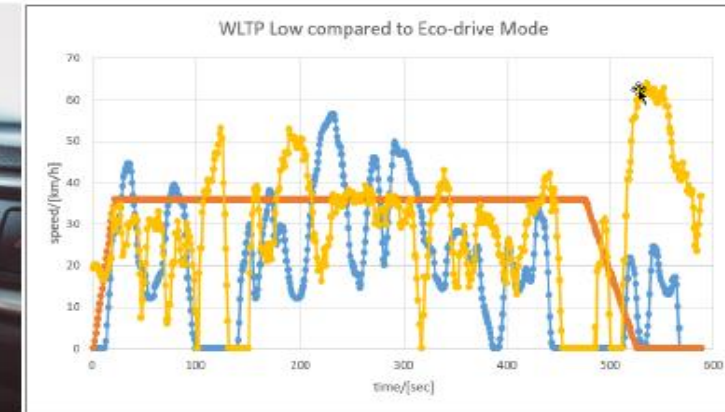


City access point  
(e.g. Urban Data Platform)

# 5G enabled FTED for Sustainable Traffic Management

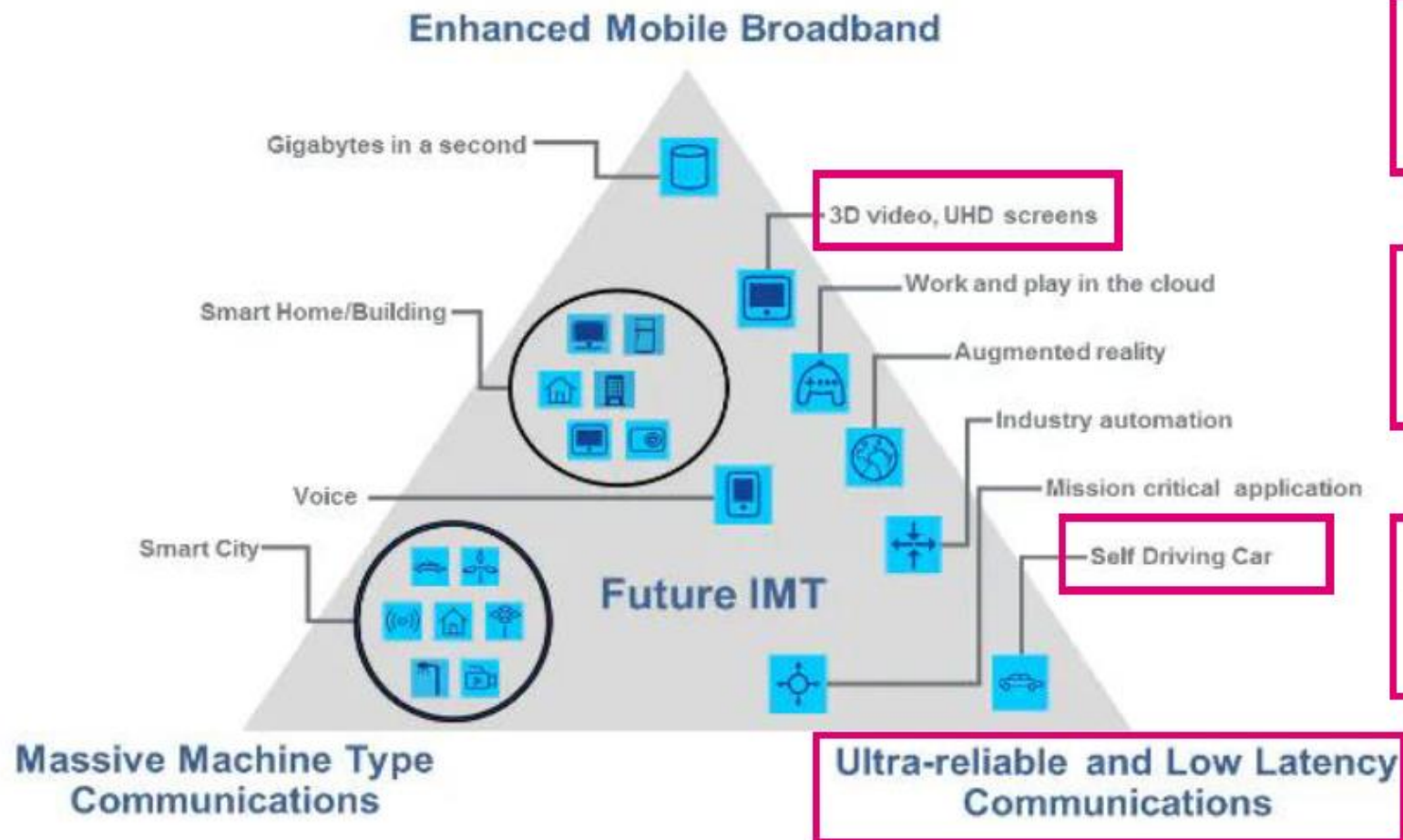


**Low Carbon  
Mobility Management  
(LCMM)**  
World-wide first  
ISO-23795-DIS  
compliant





# 5G ASPECTS COVERED IN 5G-LOGINNOV



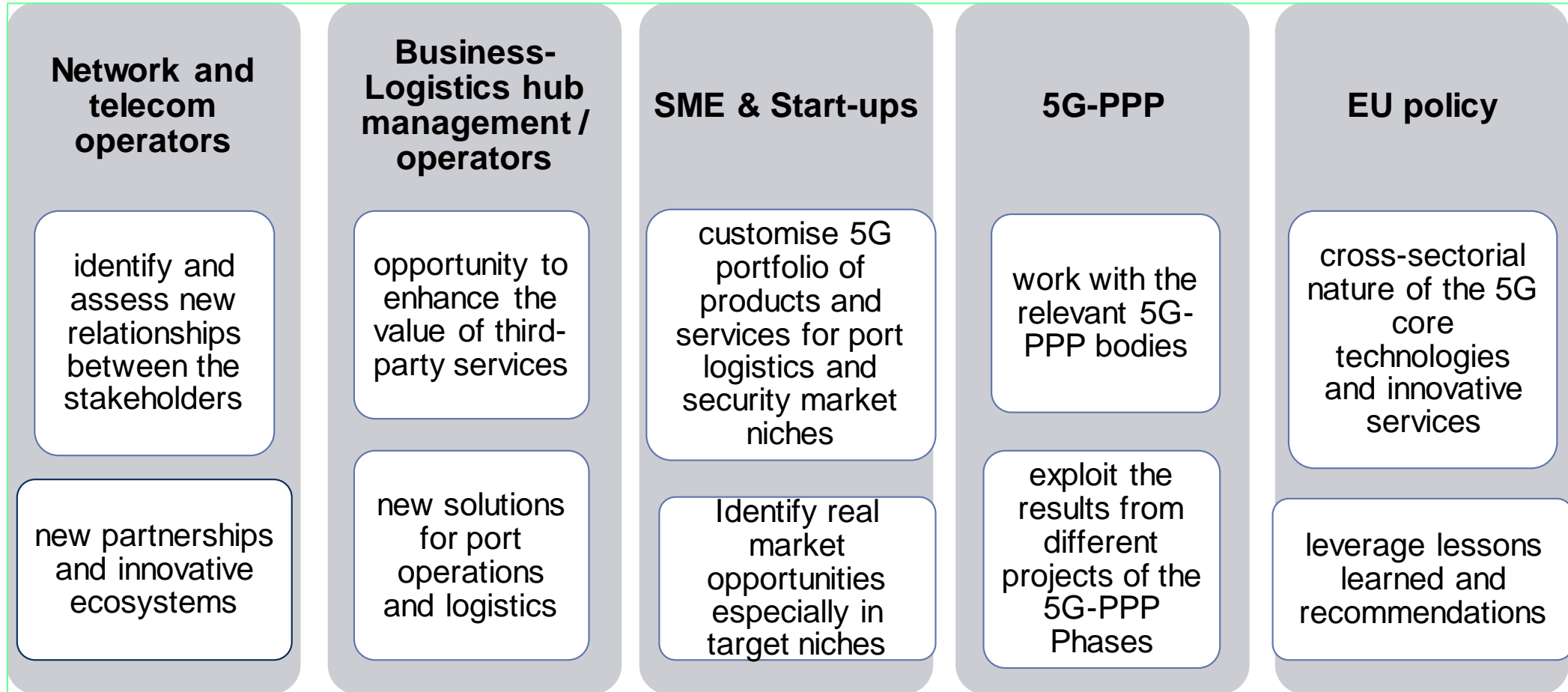
5G enabled Precise Positioning, MEC

Real-time tracking & enhanced visibility

Automated Truck Platooning:  
<25ms cellular V2X /V2V



# 5G-LOGINNOV impact



# 5G-LOGINNOV → Future of Logistics

- **TRUST:** Trust is the basis of the 5G-LOGINNOV. To use the data, the data consumer must fully accept the data owner's usage policy.
- **NEW BUSINESS ECOSYSTEM:** new innovative solutions for port operations and logistics, Identify real market opportunities especially in target niches for SMEs
- **STANDARDIZED INTEROPERABILITY:** is implemented in different variants and can be acquired from different vendors.
- **VALUE ADDING APPS:** includes also services for data processing, data format alignment, and data exchange protocols.
- **DATA MARKETS:** 5G-LOGINNOV enables the creation of novel, data-driven services that make use of data apps, cross-sectorial nature of the 5G core technologies and innovative services.
- **PI:** 5G-LOGINNOV enables the creation of new ICT infrastructure to support operations in future PI logistics networks

# 5G LOGINNOV Upcoming Events



- **World ITS Congress LA 18 - 22 September 2022**
- **TRA Conference Lisbon 14 - 17 November 2022**

## Follow Us

**Webpage:** <https://5g-loginnov.eu/>

**LinkedIn:** <https://www.linkedin.com/company/5g-loginnov-project>

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**Thank you for your attention!**

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