5G-LOGINNOV Project

Innovation & Deployment

ERTICO-ITS EUROPE

5GLOGINNOV

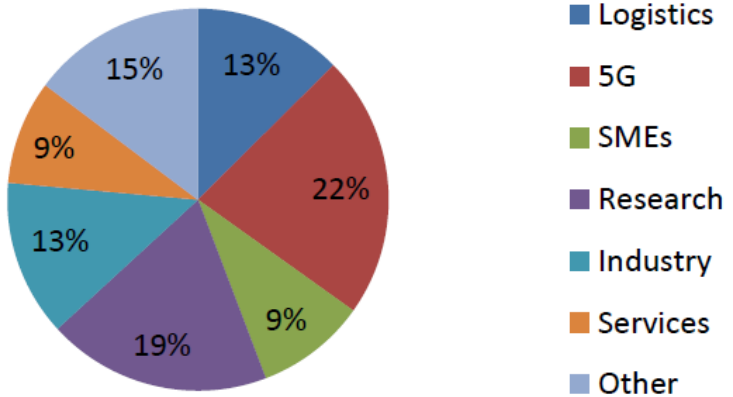
Project Fact Sheet

- **The H2020 Innovation Action 5G-LOGINNOV has a project duration of 36 months with project start 1st 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**

EC contribution	5,999,702.00 euro

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

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**

5GLOGINNOV

OVERVIEW

- 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**.
- 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-LOGINNNOV 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.

5GLOGINNOV

OBJECTIVES

OBJECTIVE 1 (O1): Develop and Deploy Next Generation ports & logistics hubs operation system architecture integrated in 5G networks at three main ports in Europe: Athens (GR), Hamburg (DE) and Koper (SL) utilising new types of 5G IoT sensors and devices. WP1-3

OBJECTIVE 2 (O2): Optimise ports & logistics hubs operation and maintenance, for reducing their operational costs with innovative concepts and use cases

OBJECTIVE 3 (O3): Reduce significantly ports & logistics hubs operation emissions (CO2/NOX) and regulate the resulting freight traffic on the future 5G logistics corridor in EU including CAM truck platooning management

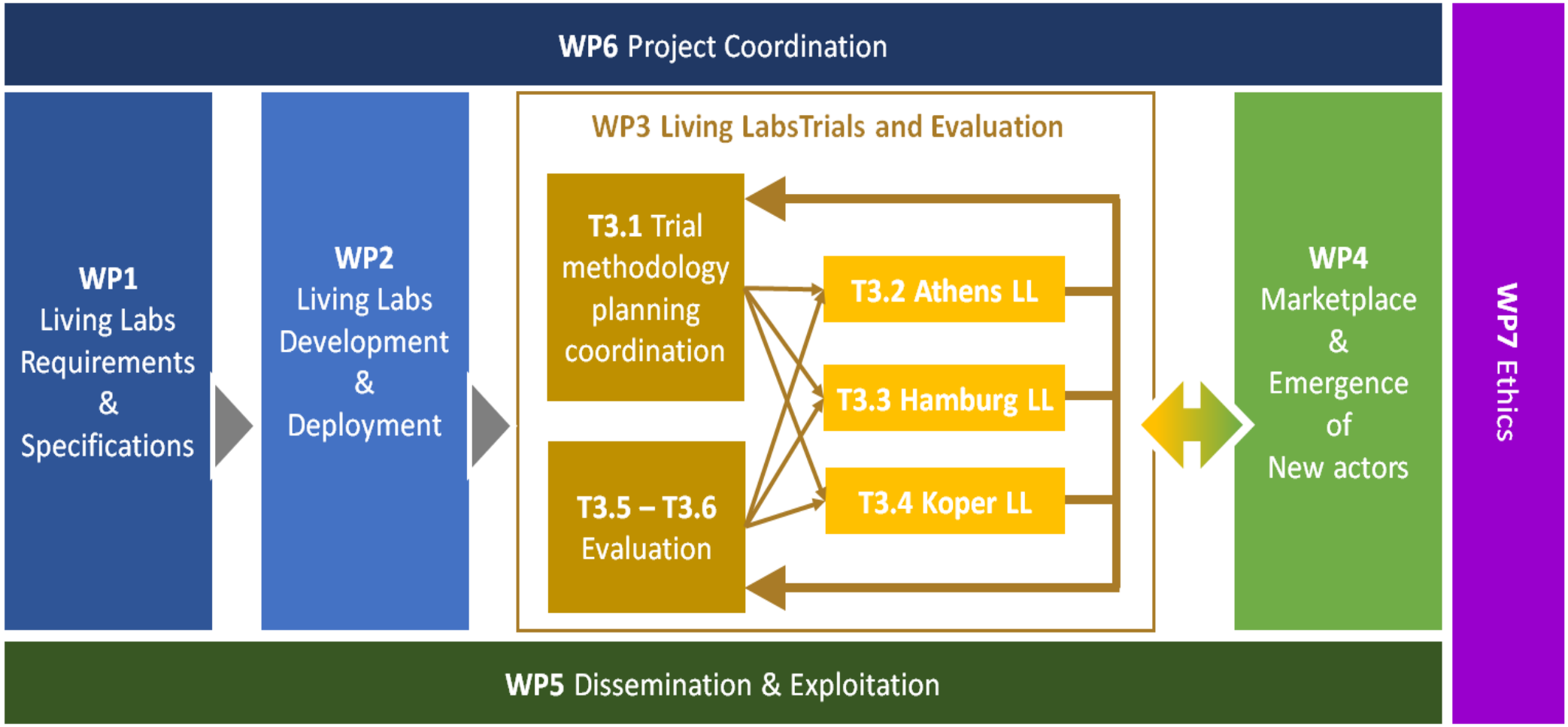
OBJECTIVE 4 (O4): Regulate the freight traffic generated by ports & logistics hubs on the future 5G logistics corridors in EU and integration of future Connected and Automated truck platoons-as 5G-LOGINNOV **GREEN TRUCK INNITIAVE according to the EU GREEN DEAL program(December 2019)**

OBJECTIVE 5 (O5): Boost ports & logistics hubs operation & maintenance innovation with involvement of new market actors including SMEs and Start-ups

OBJECTIVE 6 (O6): Support standardisation of 5G enabled Next Generation ports & logistics hubs operation system to ensure interoperability, platform openness and operation harmonisation around future 5G Logistics x-border corridors

OBJECTIVE 7 (O7): Support adoption and take up of 5G enabled Next Generation ports & logistics hubs operation system in Europe and beyond

WPs


WP6 Project Coordination
WP1 Living Labs Requirements & Specifications
WP2 Living Labs Development & Deployment
WP3 Living LabsTrials and Evaluation
T3.1 Trial methodology planning coordination
T3.2 Athens LL
T3.3 Hamburg LL
T3.4 Koper LL
T3.5 – T3.6 Evaluation
WP4 Marketplace & Emergence of New actors
WP7 Ethics
WP5 Dissemination & Exploitation

AT GLANCE: LLs

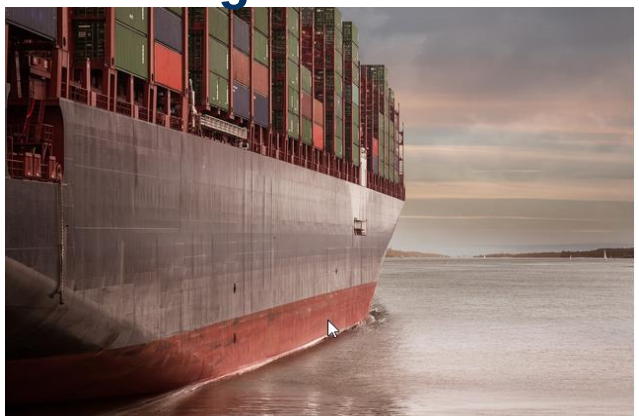
Piraeus-Athens

- **UC3**: Optimal selection of yard trucks
- Installation of a 5G access point on yard trucks
- e.g., 5G latency, precise localization services, etc.

UC4: 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
- **UC7**: 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

Hamburg



UC8/9: 5G-LOGINNOV Floating Truck & Emission Data (FTED)

UC10: 5G-LOGINNOV 5G GLOSA & Automated Truck Platooning (GTP)- under 5G-LOGINNOV Green initiative

UC11: 5G-LOGINNOV dynamic control loop for environment sensitive traffic management actions (DCET)

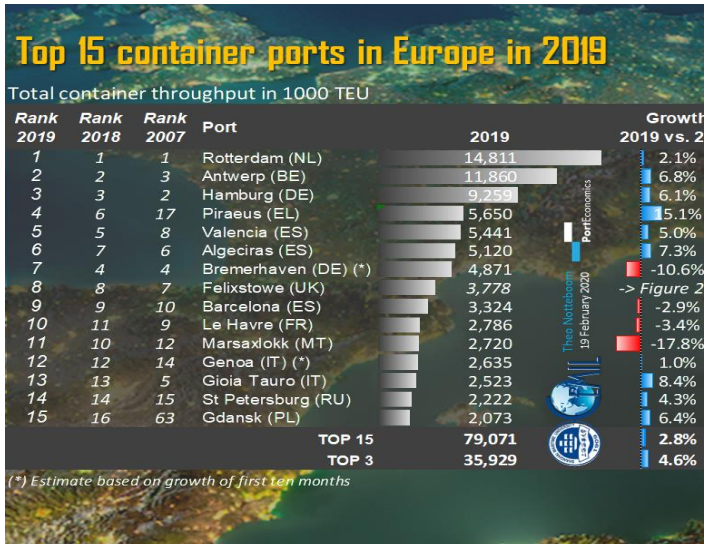
Luka Koper

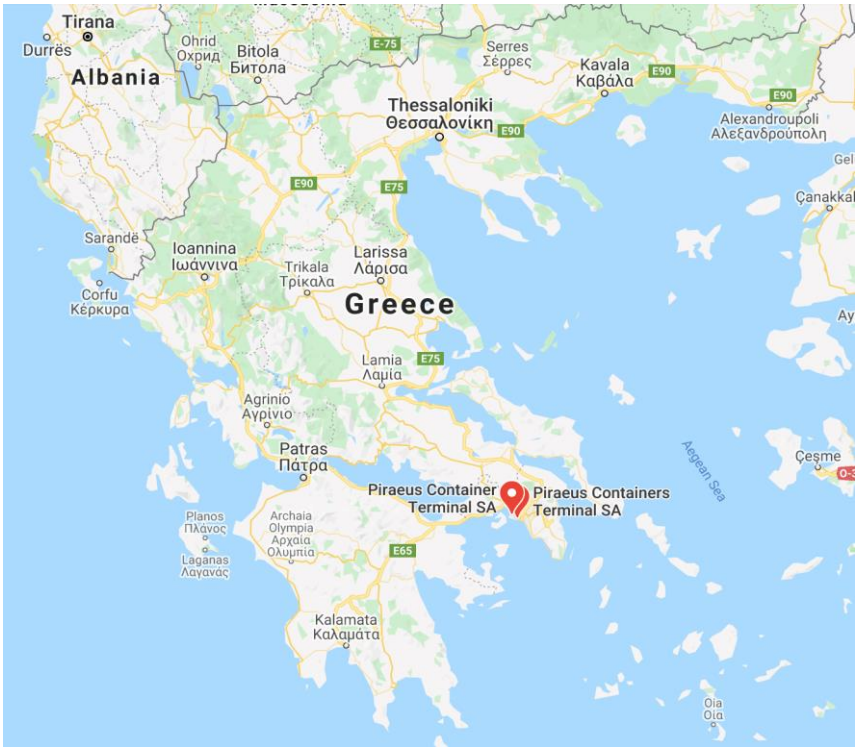
UC1: port control, logistics and remote automation
UC2: business critical and mission critical communications

5GLOGINNOV

Piraeus-Athens LL Overview

- Athens Port, Greece (Partners involved: **ICCS**, **PCT**, **VODAFONE**)

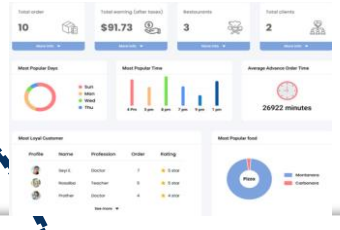




5GLOGINNOV

Video Surveillance APP Instance

4K video resolution



Container Status APP Instance

Application

NFVO / VNFM

VIM / NFVI

openvim

openstack

Open Source MANO

MANO platform

5G NSA: 4G Core - EPC

5G SA: 5G Core

5G Core & Protocol Stack
(Open Source or pre-commercial)

open5Gcore

vodafone

OPEN AIR INTERFACE

Core Network

Access (gNB)
(SDR e.g.,USRP **N310**, or pre-commercial)

OPEN AIR INTERFACE

vodafone

RAN – 5G NR

Container seal detected

VM/Container

GPU – ML/AI model

nrUE
(SDR e.g.,USRP N310, or pre-commercial)

VM/Container

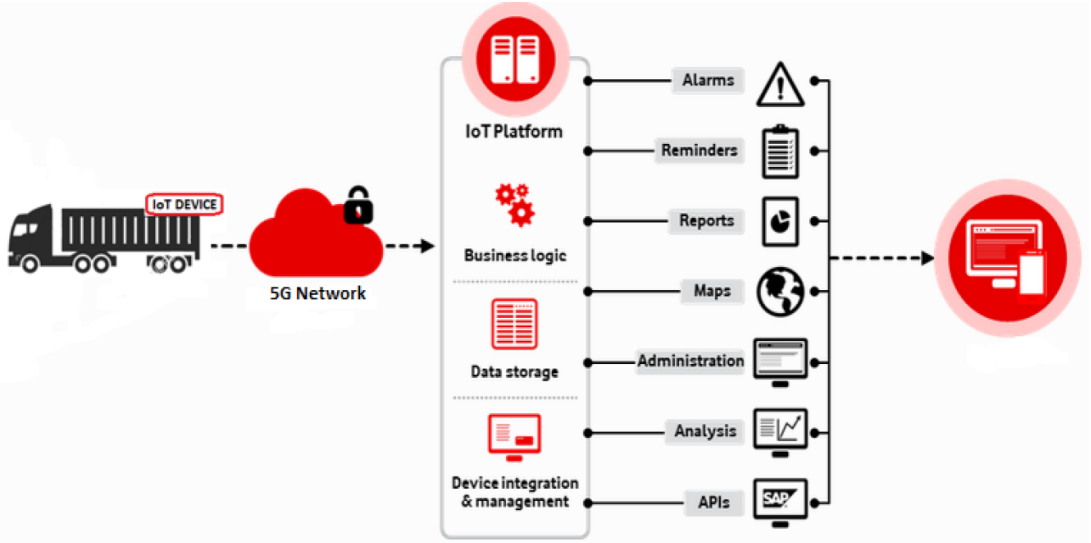
GPU – ML/AI model

nrUE
(SDR e.g.,USRP N310, or pre-commercial)

Far edge computing

5GLOGINNOV

Predictive Maintenance



Optimal allocation of container jobs to trucks

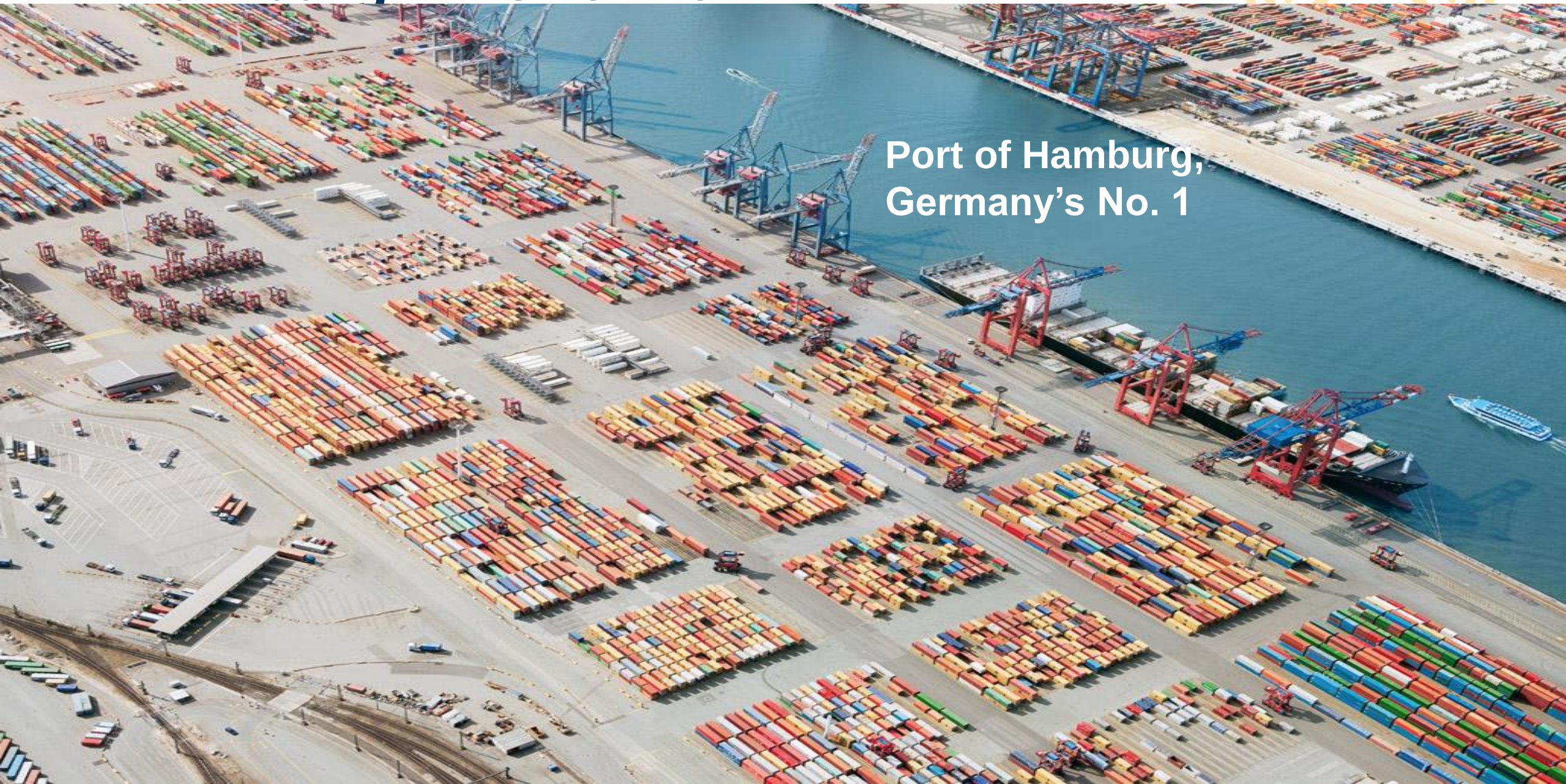
- **5G access point will be installed on trucks**

- Collect and forward in real-time with low latency telemetry data over the 5G network to the MANO platform
- PREDICTOR tool was developed through the COREALIS project (768994/MG-7.3-2017)

- Current implementation based on WiFi (driven from insights of INTE-TRANSIT 5187/2C-MED12-05 project)
  - Sub-optimal localization of trucks: suboptimal traffic management, increased operational costs, increased CO_2

5GLOGINNOV

Hamburg LL Overview



Use Cases

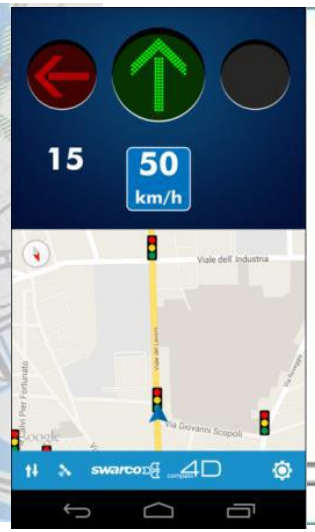
- **Use cases related to Floating Truck & Emission and Automated Truck Platooning**

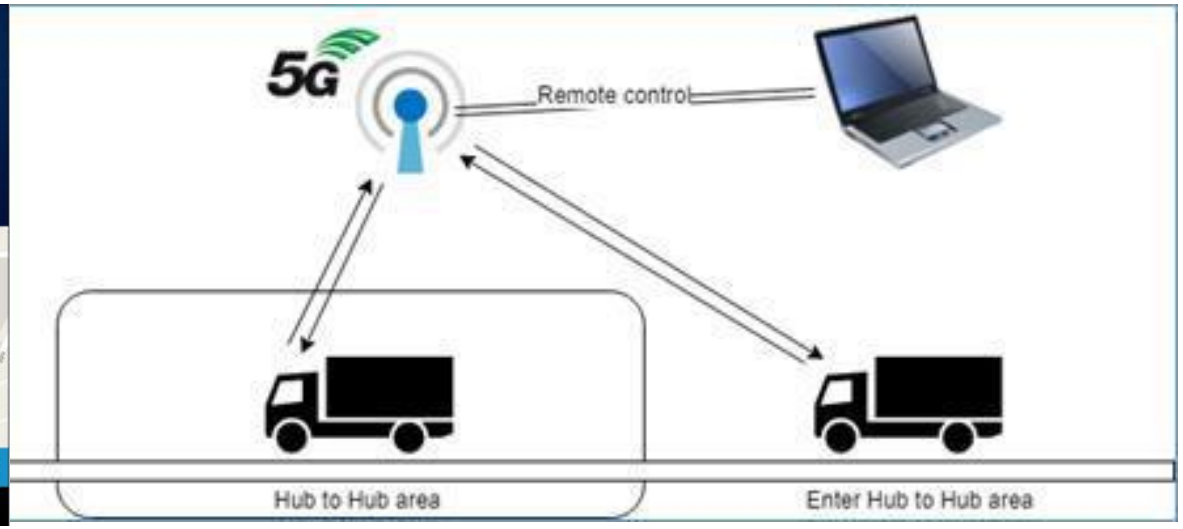
  UC8/9: 5G-LOGINNOV Floating Truck & Emission Data (FTED)

  UC10: 5G-LOGINNOV 5G GLOSA & Automated Truck Platooning (GTP)-under 5G-LOGINNOV Green initiative

  UC11: 5G-LOGINNOV dynamic control loop for environment sensitive traffic management actions (DCET)

- **Collaboration with** Local administration (I.T.S. Policy Committee)





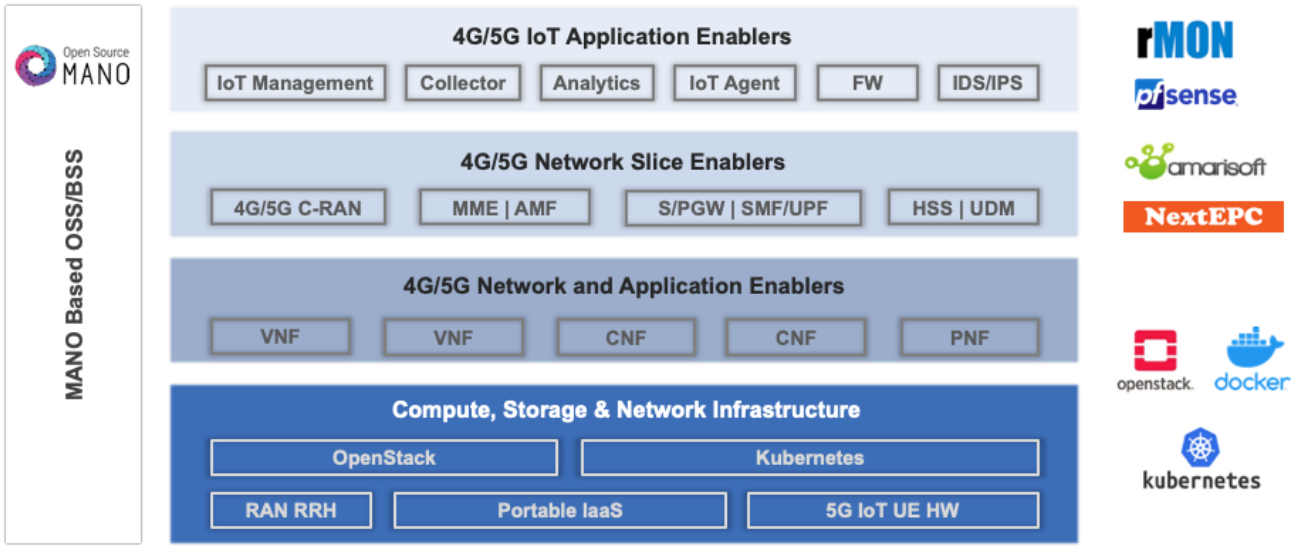
Luka Koper LL Overview

Port of Koper, Koper municipality, Adriatic Sea, Slovenia

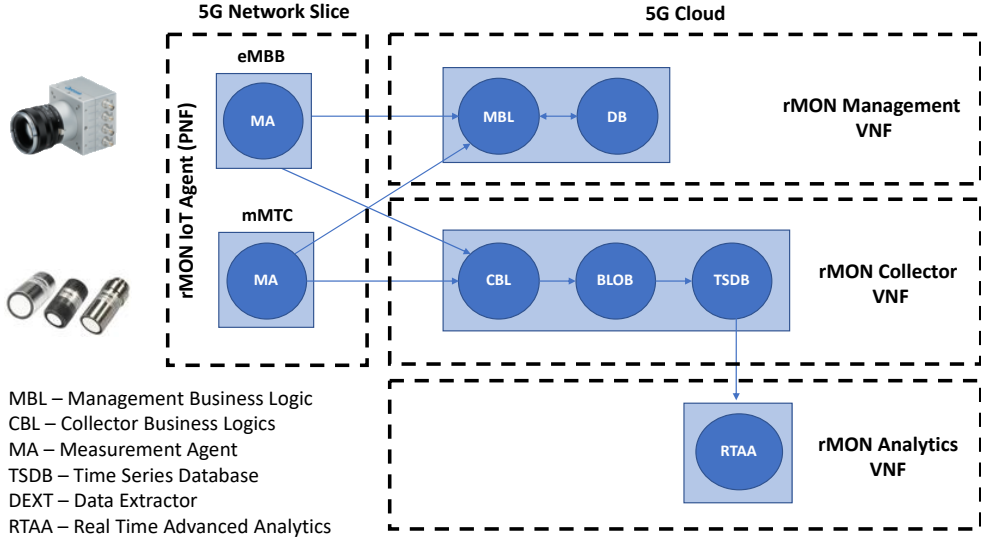
5GLOGINNOV

UC1: 5G-LOGINNOV Management and Network Orchestration platform (MANO)

- **Target:** automated deployment and life cycle management (MANO) of network and services VNF (Virtual Network Functions) components for the addressed vertical scenarios – rMON 5G IoT Platform



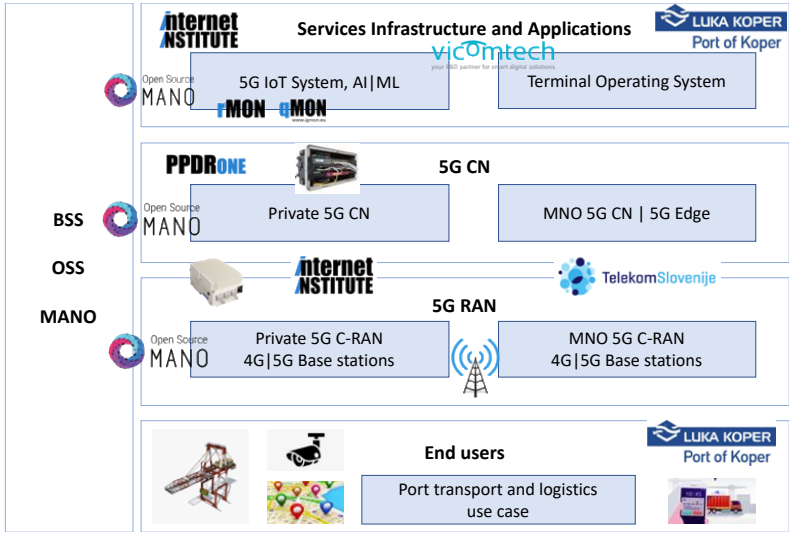
rMON
pfsense
amarisoft
NextEPC
openstack
docker
kubernetes



5GLOGINNOV

UC5: 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 / exposure to TOS| identification of container markers | detection of structured damage)*
- **Target 2:** port infrastructure monitoring and remote metering with 5G IoT to SCADA *(operating machine monitoring and leak detection identification with water sensors)*
- **Target 3:** resilient 5G based network services *(supporting data transfer redundancy between operational port infrastructure and operations center)*



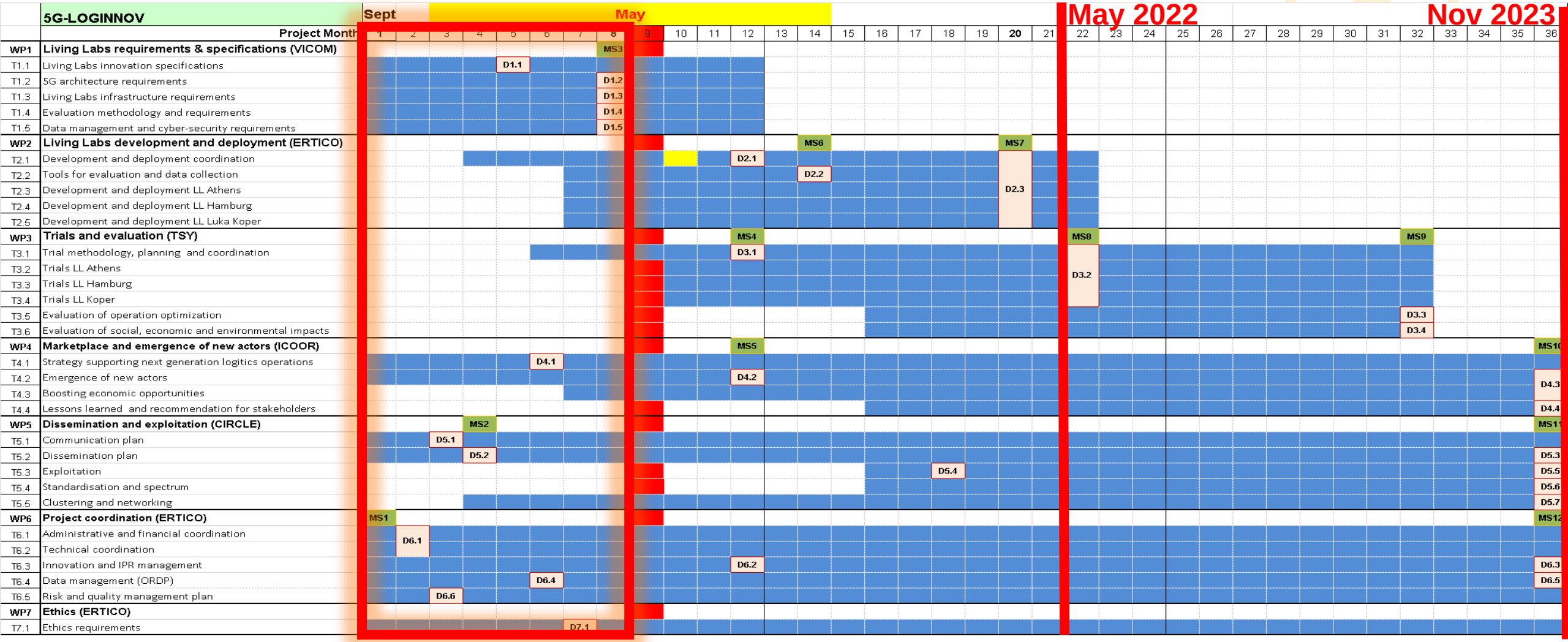
UC6: The 5G-LOGINNOV 5G mission critical communications in ports

- **Target 1:** A real-time video surveillance use case *(body-worn cameras | portable video surveillance cameras | drone-based surveillance)*
- **Target 2:** private security operations management and support *(personnel/team status monitoring | positioning and triage operations support with dedicated mobile applications)*
- **Target 3**: network reliability and resilience using public and standalone 5G networks

5GLOGINNOV

Working Plan:

RV1=M9 RV2=M21 RV3=M39



5GLOGINNOV

Thank you!

5GLOGINNOV

Project coordinator
Dr. Eusebiu Catana
Innovation & Deployment
ERTICO-ITS EUROPE
e.catana@mail.ertico.com

Co-financed by the European Union
Connecting Europe Facility