MERIDIAN Deliverable D5 – "D1.05 – Capitalisation 1 Report"

Document Information

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Capitalisation Workshop & Knowledge Building Workshop in Livorno, Italy 13.12.2023

On 13 December 2023, the MERIDIAN Capitalisation Workshop with a focus on multimodal activities was held in Livorno at the Interporto Toscano Amerigo Vespucci, organised jointly by SINA, the Port Authority of the Northern Tyrrhenian Sea (Port of Livorno) and the Port Authority of the Northern Adriatic Sea (Port of Ravenna). The event, held in hybrid mode with around 30 participants in the room and online, also coincided with the first Knowledge Building Workshop.

The event began at 09:00 with a warm welcome from Giampiero Costagli of the Port Authority of Livorno, and then gave the words to Port of Ravenna for the introduction of the event.

Francesco Magagnoli introduced the objectives of the workshop and the structure of future events with at least two more workshops (one in spring and one in winter 2024) and two questionnaires with feedback on the activities with the common objective of evaluating the success of the multimodal tasks. This first workshop was divided into two parts, with the first part dedicated to multimodal activities with particular attention to the transition and best practices learned between URSA MAJOR neo and MERIDIAN. During this session, the four ports, partners of the MERIDIAN project, and the ZAI consortium presented their projects.

Margit Kuuse and Stefano Terribile from the Port of Ravenna exposed the projects carried out in URSA MAJOR neo and the lessons learned and what to improve, they then presented the projects underway in MERIDIAN and any future applications of a new project proposal.

Following this, Ivano Toni from the Port of Livorno presented the existing projects in MERIDIAN and what they have learned from previous projects, such as environmental problems relating to pollution and how to mitigate them.

Alberto Cozzi from the Port of Trieste and Simone Pacciardi from the Port of La Spezia presented the solutions proposed to optimise travel to and from the respective port authorities, such as the management of advance authorizations for heavy vehicles to enter.

Finally, Alberto Milotti presented the technological innovations implemented at the Verona Interport.

After the break, the technical interventions were presented starting from Michael Trees of the Ministry of Baden-Württemberg who presented the project of a mobility data integration platform to cope with the large amount of data that is necessary to make a system work multimodal. The platform will have the ambition of acting as a monitoring center for 45 tunnels as well as monitoring intelligent transport systems to improve transport safety and efficiency.

Following this, Edwin van Hassel of the University of Antwerp presented the Frontier project, which is not linked to the MERIDIAN project. The University of Antwerp is developing logistics simulation models to evaluate the impact of different freight transport supply and demand management strategies, as well as a decision support approach to resolve conflicts between different stakeholders. Despite not being a partner of the project, the presentation of this project was extremely interesting for the objective of the event.

Ilaria de Biasi from the Brenner Motorway then presented an overview of the multimodal activities underway in MERIDIAN, such as the activities of the BrennerLEC project for the installation of low-cost sensors together with Austria and Bavaria.

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Following this, Mr. Cioni from the Tuscan Interport illustrated the complexities of managing the interport and multimodal exchanges and the solutions proposed to optimise the efficiency of the exchange systems between the various multimodal transports.

As the penultimate intervention, the project for the port of Livorno in URSA MAJOR neo was presented with the related lessons learned to optimise vehicle routes and planned access to and from the port and how these activities have optimized road safety.

The last intervention by AVR Group introduced the activities of AVR, i.e. the company that manages the control room that manages the main road (S.G.C. in Italian) Florence-Pisa-Livorno, which was visited in the afternoon.

After lunch, the participants moved to Empoli, about 30 minutes from Livorno, to visit the radio room that manages the S.G.C. FI-PI-LI. This route is one of the most important arteries of the road system of the Tuscany Region, it crosses the central-northern area directly connecting the cities of Florence, Pisa (passing the airport), Livorno (entering directly into the port), and the related provincial territories. The artery branches out for approximately 100 km with separate double-lane carriageways for each direction of travel, including 30 junctions and approximately 200 works of art including bridges, viaducts, overpasses and tunnels. The artery is at the center of the intermodal transport system since, in addition to acting as a car connection between the above-mentioned locations, it also crosses the Navicelli canal (the outlet of the Pisan shipbuilding industry on the Tyrrhenian Sea), managing the mobile bridges intersecting with it in a such as to guarantee and optimise the passage of vehicles heading towards the port and of vessels entering/exiting the shipyards. The radio room with dedicated operators assists each traveler of the FI-PI-LI, collects, analyses and disseminates information on traffic and road conditions, provides assistance to the intervention of the traffic police and emergency vehicles, monitors the situation of the construction sites in course and environmental conditions to guarantee the safety and practicability of the road.

1. The presentations are available for reference in Annex 1.

2. Please locate the signature list of attendance in Annex 2.

3. For those who attended digitally, the list of attendance can be found in Annex 3.

ANNEX

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ANNEX 1

THE PRESENTATIONS

CAPITALISATION WORKSHOP

ON

THE MULTIMODAL ACTIVITIES

Livorno 13/12/2023

GOALS

➤ Sharing knowledge and best practices

➤ Learning from each other's experience

➤ Using best practices in future MERIDIAN activities
and in VERKKO (hopefully!)

The Port of Ravenna Authority team is available for any
necessary support

METHODOLOGY FOR THE OVERALL TASK

➢ N°3 workshops: monitoring the progress of multimodal activities

➢ N° 2 questionnaires: feedback on activities and suggestions for the following workshops

➢ Feedback: assessing the overall success of the workshop

EVALUATING THE SUCCESS OF THE MULTIMODAL TASK

➢ Do you feel the workshop has had a positive impact on your implementations? How?

➢ Did you manage to successfully solve all issues occured?

➢ Did you get any new ideas for future implementations?

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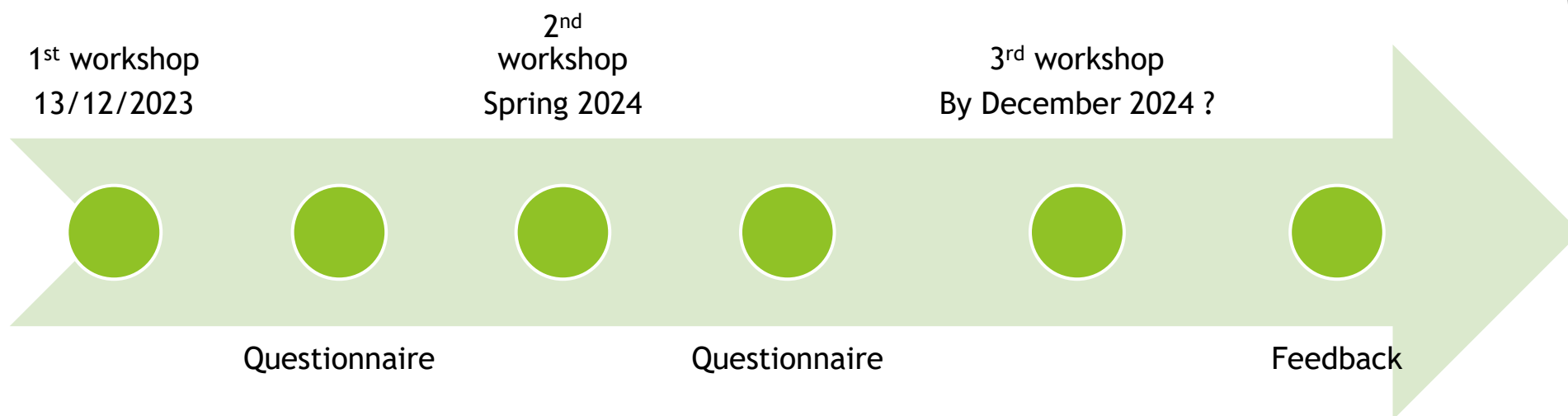
Structure of the 1ˢᵗ Workshop

1ˢᵗ PART
Multimodal activities

Port of Ravenna Authority

Port of Livorno Authority

Port of Trieste Authority

Port of La Spezia Authority

Consorzio ZAI

2ⁿᵈ PART
Technical interventions

Ministerium Fur Verkehr Baden-Wurttemberg

University of Antwerp

Autostrada del Brennero

Interporto Toscano

Port of Livorno Authority

AVR Group

URSA MAJOR neo: activities

1) INSTALLATION OF MONITORING CAMERAS TO ENHANCE SECURITY

▶ On November 2018, n°8 cameras, purchased within the project, were installed in the terminal, meaning that **milestone 20 has been reached successfully**;

▶ The cameras have been placed in strategic position on the top of lighting towers to improve the security of the ferry terminal.

▶ Recorded images are more visible, since all images are full HD; particularly clear on night vision.

DONE

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URSA MAJOR neo: activities

2) DEPLOYMENT OF A SYSTEM WITH TWO CAMERAS AT THE PORT AREA

to trace the vehicles in the port

to allow understanding of the destination and itineraries of the vehicles when they are in the port area, increasing its safety and security and allowing to achieve:

- the knowledge and analysis of traffic flows (in particular for heavy vehicles);

- the knowledge of traffic volumes along the road network approaching to the port to understand how to better distribute these volumes based on the categories of vehicles transiting in the port area;

Deployments are ongoing and will be

completed by December 2023

URSA MAJOR neo

LESSONS LEARNT / OUTCOMES:

➢ More safe operations and security at the Ro-Ro terminal

➢ Expected improvement of road safety along via Trieste

➢ Less congestion in the port area as ITS tool to mange heavy goods vehicles

within the port are always effective

➢ Possible new lessons learnt and outcomes coming from Evaluation

Other Activities: Road Last Mile Connections

▶ At the Terminal Container of the Port of Ravenna **automated gates** are already available: **OCR system** detects container number and allows a digitization of all paperwork.

▶ **Video-cameras** installed in adequate locations within the terminal gates

▶ **Dashboards** that enlist the type of goods expected to exit the terminal along with customs authorization

▶ **Remote controlled barriers** on exit lanes

▶ **Totems** with internal video camera and intercoms positioned on gate lanes

▶ Public Authorities are able to better **control and verify containers** exiting the terminal premises thanks to real time feedback on delivery processes made by the terminal; this translates in faster exit times for trucks while authorities conserve the right to verify **contents of containers** by simply not activating exit barriers.

MERIDIAN PROJECT

ICT tools and equipment for:

- ➢ Booking

- ➢ Tracking and counting

- ➢ Rerouting and queues management

- ➢ Data analysis and reporting

MERIDIAN – CURRENT STATE OF ART

➢ First call for tenders have been launched in 2023 and will be assigned during 2024

➢ Deployments will start in 2024 to guarantee perfect interconnection with the URSA MAJOR neo project that will be concluded by the end of 2023.
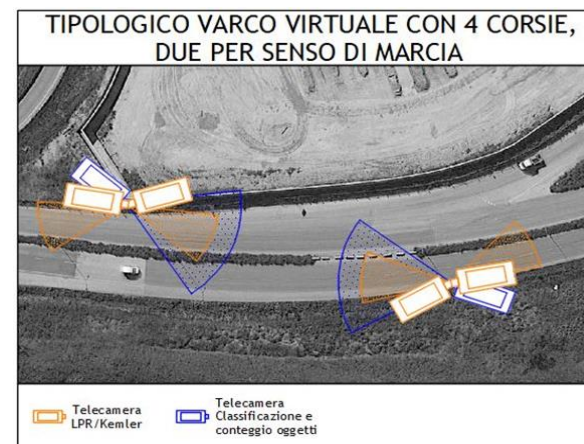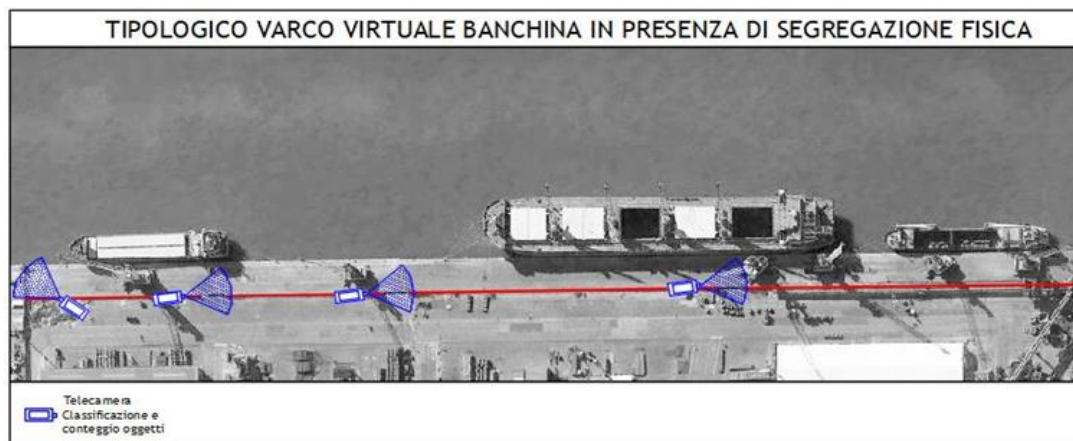
Booking

▶ Booking **the entrance to the terminal** for goods withdrawal/release

▶ Booking can be done via a **web portal** or an **application**

▶ Integrated with **Port Community System** and **private operators systems**

TRACKING AND COUNTING (1/3)

▶ Digital identity based on a smartphone app for a fast and secure way to verify the access permits

▶ Virtual gates with smart cameras on quays and roads accessing the port, for counting people and vehicles

TIPOLOGICO VARCO VIRTUALE CON 4 CORSIE, DUE PER SENSO DI MARCIA

Telecamera LPR/Kemler
Telecamera Classificazione e conteggio oggetti

TIPOLOGICO VARCO VIRTUALE BANCHINA IN PRESENZA DI SEGREGAZIONE FISICA

Telecamera Classificazione e conteggio oggetti

TIPOLOGICO VARCO VIRTUALE CON 2 CORSIE, UNA PER SENSO DI MARCIA.

Telecamera LPR/Kemler
Telecamera Classificazione e conteggio oggetti

TRACKING AND COUNTING (2/3)

Video analysis system based on AI algorithms able to **detect**, **classify**, **count** and **track**

License plate recognition

Classification

Kemler code recognition

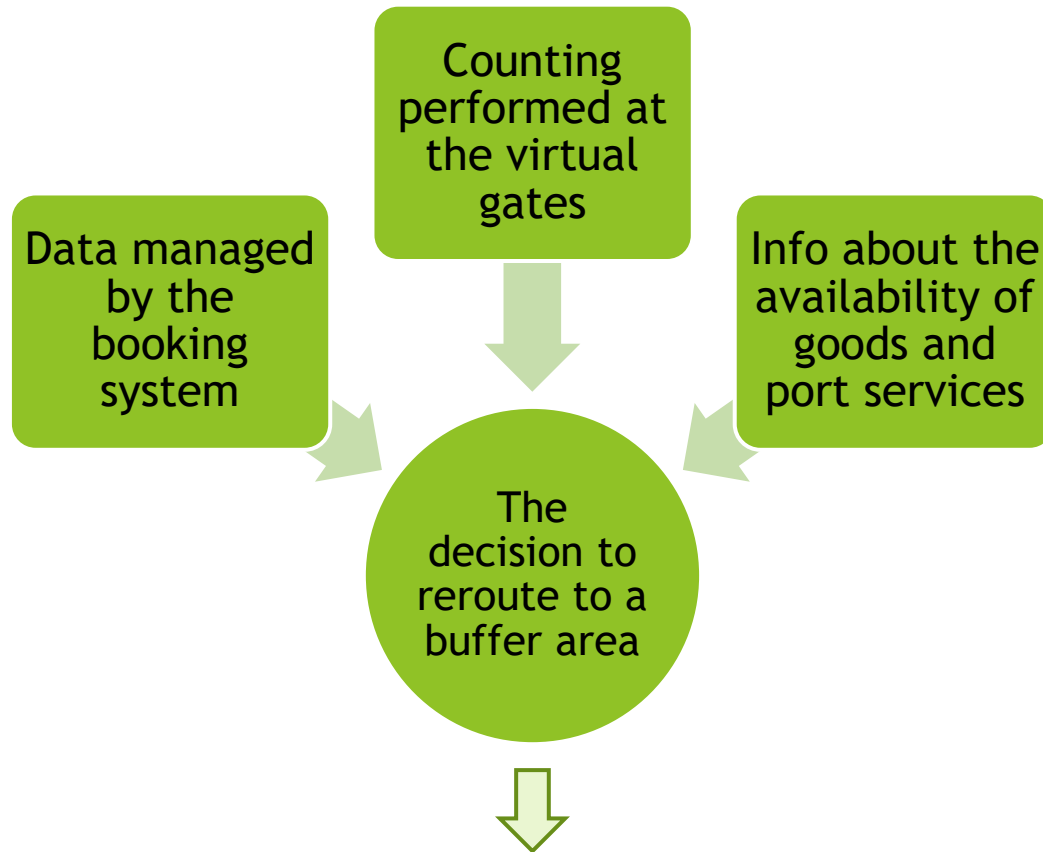Codice ILU + tavola EN 13044
Esempio su un nuovo semirimorchio

ILU – BIC code recognition

REROUTING AND QUEUES MANAGEMENT

Counting performed at the virtual gates

Data managed by the booking system

Info about the availability of goods and port services

The decision to reroute to a buffer area
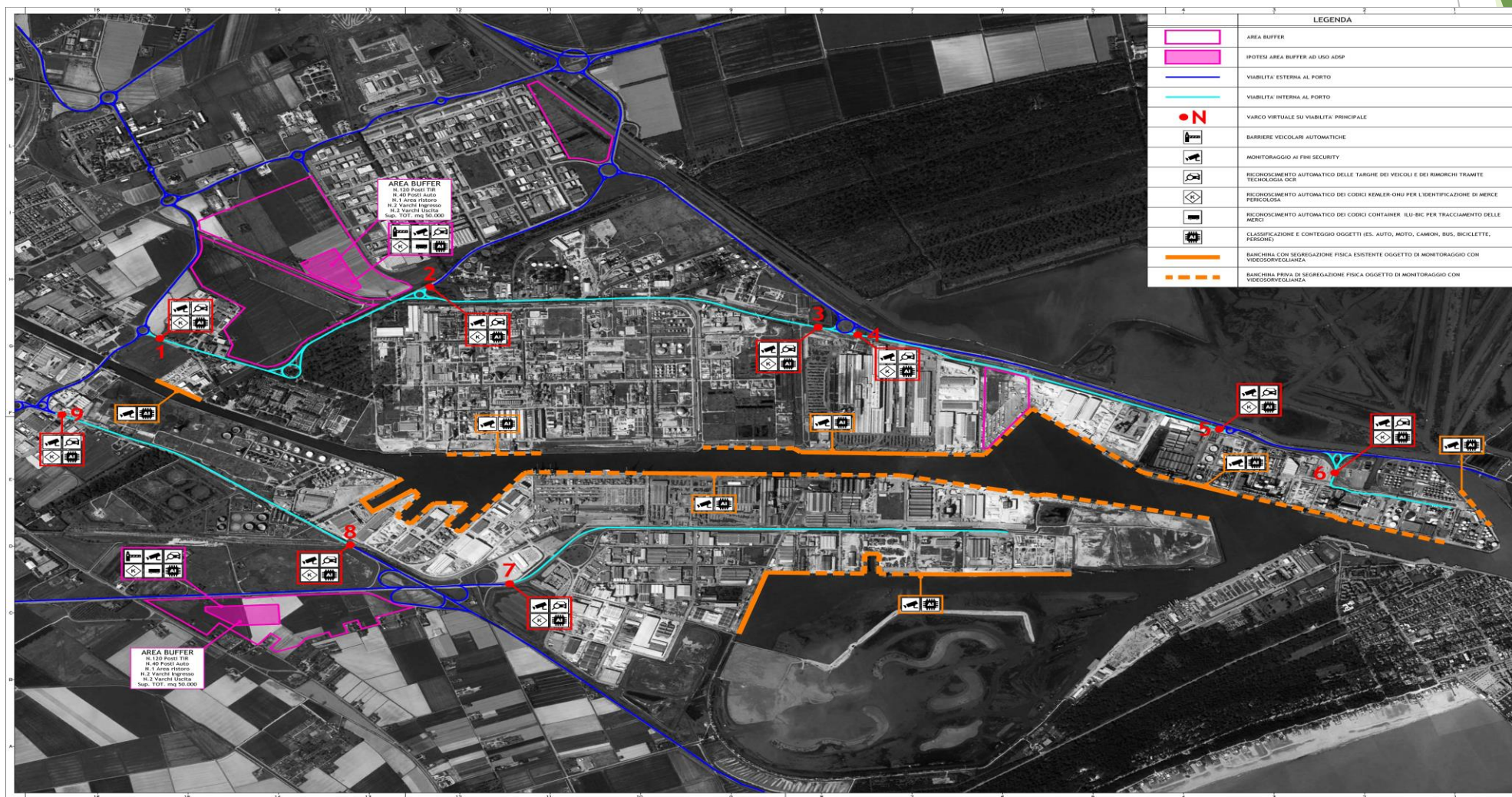
In case of rerouting, the drivers will be notified via push notifications and street panels

DATA ANALYSIS AND REPORTING

Based on data analysis, it is possible to:

➢ **Evaluate/plan interventions** to improve the port's performance based on the analysis of specific KPIs

➢ **Extract knowledge and useful information to support the decision-making process** (workflow management and decision support system)

➢ **Activate specific alerts** on predefined thresholds

FUTURE: VERKKO PROJECT PROPOSAL

▶ Connecting the principal **nodes and infrastructures** (terminals, logistic areas, industrial parks, truck park) to the **virtual gates** that will be installed

▶ **Monitoring, control and re-routing** in the entire port area through real-time data exchange by installing ICT equipment, devices and software systems

Positive impacts on:

▶ **Efficiency:** the truck flows can be re-routed and re-scheduled between the different industrial-logistic nodes and the parking areas

▶ **Safety:** the reduction of the congestion level of the road network and in particular the frequency of queue in/out of the terminals and industrial plant gate

▶ **Security:** to improve the control of the accessibility both of the road network and industrial-logistics nodes

FUTURE: CONNECTIONS TO THE NEW LOGISTIC AREAS

NEW RAVENNA AGRI-BUSINESS HUB: AREA L2

✓ New **multimodal logistics platform** including **plants** for agri-food products.

✓ **Cost of Works: € 40 Million** for urbanization, road and rail infrastructure connections, plants for processing, storage and preservation of agri-food products.

✓ **Max € 20 million** financed with **PNRR resources.**

✓ A **photovoltaic system**, built on part of the platform, will serve the operators, under the **Port's Energy Community Regime.**

✓ **An ICT system,** based on AI and Digital Twin technologies, will be developed for tracking, monitoring and control the import/export freight flows and the

35.5 ha (owned by the AdSP)

NEW SAFE ROAD PARKING AND SERVICE AREA

✓ A new **safe parking area** with useful services will be built for road transport users to guarantee more security & safety. This is will be a buffer area able to host trucks waiting to load and unload goods in the port terminals

✓ **Cost of Works:** € 4 Million from Port of Ravenna Authority

✓ **A video-surveillance-control system and a lightning system** will be installed to ensure a high level of security 24 h – 7/7; in addition, a specific **control room** will be operative to monitor and control the users access to the areas and services
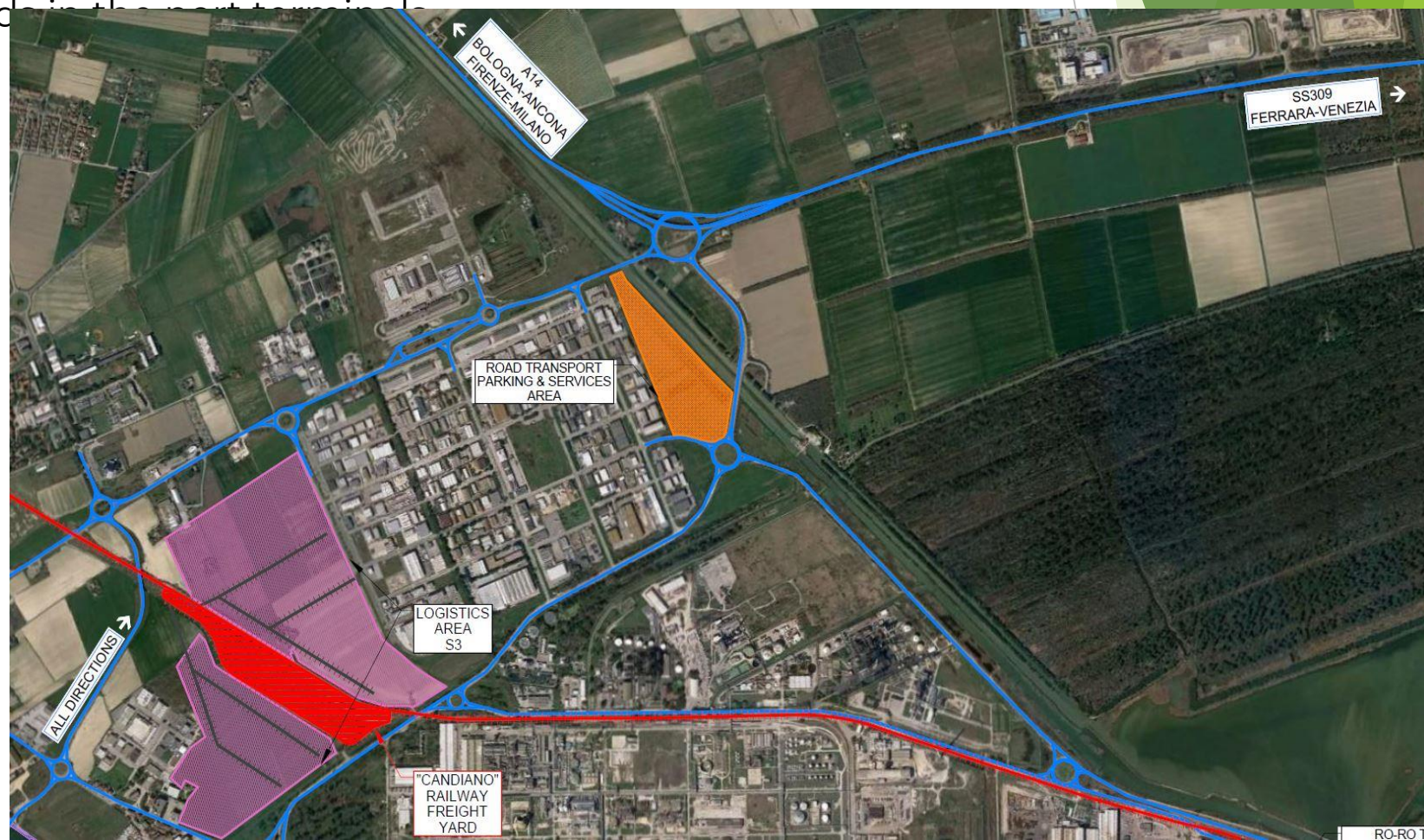
Thank You

STEFANO TERRIBILE

Logistics and Intermodality Coordinator

MARGIT KUUSE

EU Projects and Promotion Department

| E: progettiue@port.ravenna.it |

C-ITS Corridor Services for the port of Livorno

Eng. Ivano Toni

Port Network Authority of the North Tyrrhenian Sea

C-ITS for Ports

Goods

Transit time

Delays

Safety & Security

Primary and secondary end users

Enablers:
- <u>Automotive industry</u> → Implementation of on-board equipment, HMI, Car-2-Car services, in-vehicle signage of Infrastructure-2-Car services, etc..
- <u>ICT providers</u> → Design and develop ICT for ITS services;
- <u>Standardisation bodies</u> → Define and support the regulatory process for the standardisation of ICT (e.g. ETSI).

The **main end users** of C-ITS services are:
- <u>Heavy vehicles drivers</u> → Real time information;
- <u>Logistics platforms</u> → Management of the parking spaces;
- <u>Road operators</u> → Management of emergencies and accidents.

The **secondary users**
- <u>Road authorities</u> →Planning, implementation of RSUs, infrastructure operation and management;
- <u>Traffic road operators</u> → Management and infrastructure operation, provision of traffic information and Infrastructure-2-Car services;
- <u>Port Authorities</u> → Planning and implementation of sensors and communication units.

The Port of Livorno: why the C-ITS?

Logistic and attractive poles	Port traffic	Environmental impact

C-ITS for the Port of Livorno and its hinterland

Legend:
- Highway
- Major communication road
- Port of Livorno
- Vespucci Freight Village

The environmental advantages of C-ITS/1

High-temperature combustion products such as nitrogen oxide (NO_x);

Products of incomplete combustion, including particulate matter (PM), carbon monoxide (CO), and hydrocarbons (THC);

Combustion products from waste fuels, including heavy metals and sulphur oxides (Sox);

Products from other sources, e.g., volatile organic compounds (VOC);

Products of total combustion that generate the greenhouse effect (CO_2).

The environmental advantages of C-ITS/2
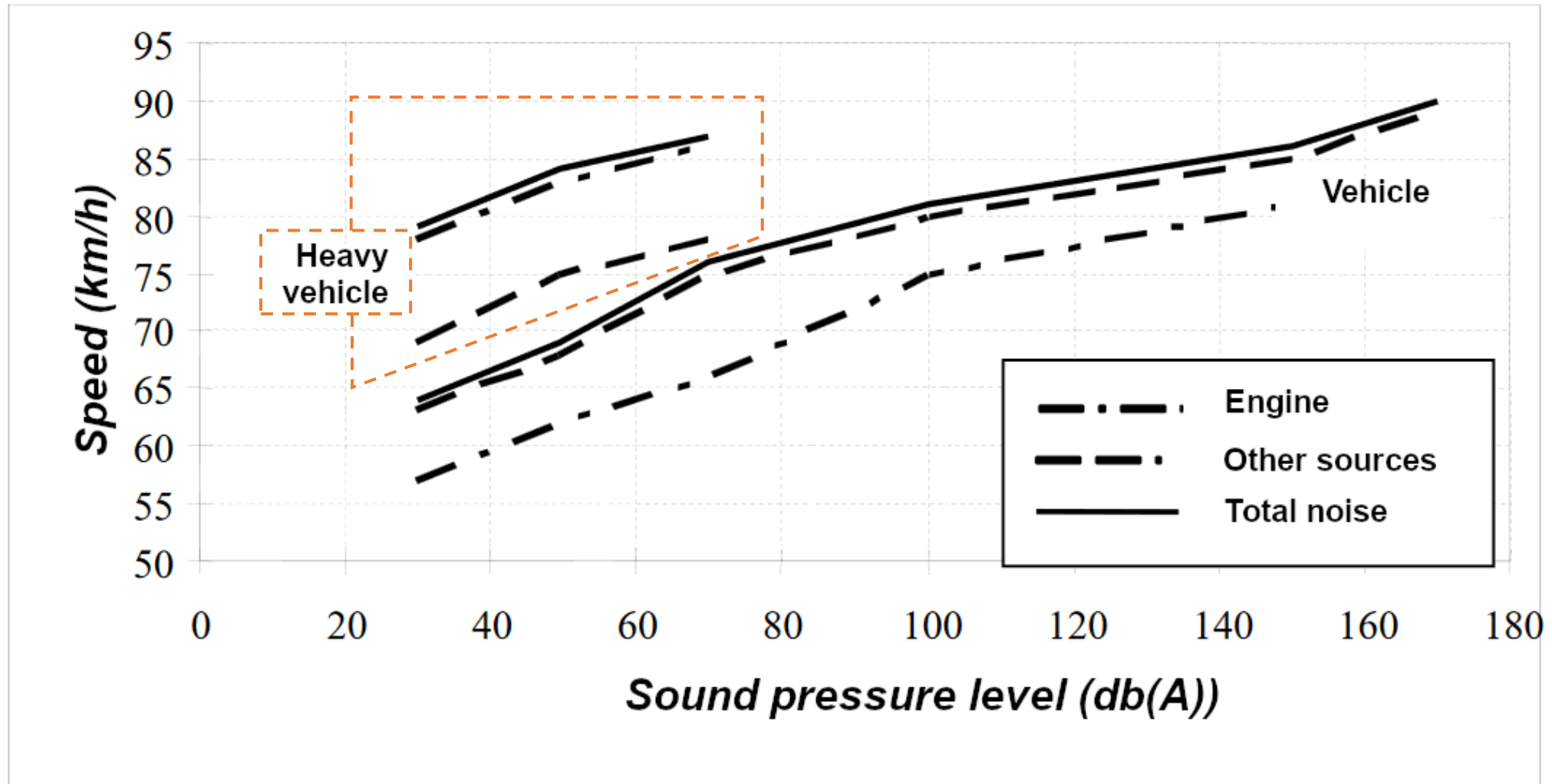
The future of C-ITS for the Ports

The future of C-ITS for the Port of Livorno

Naval traffic

Port traffic

Hinterland area traffic

Goods

Meteorological

Noise
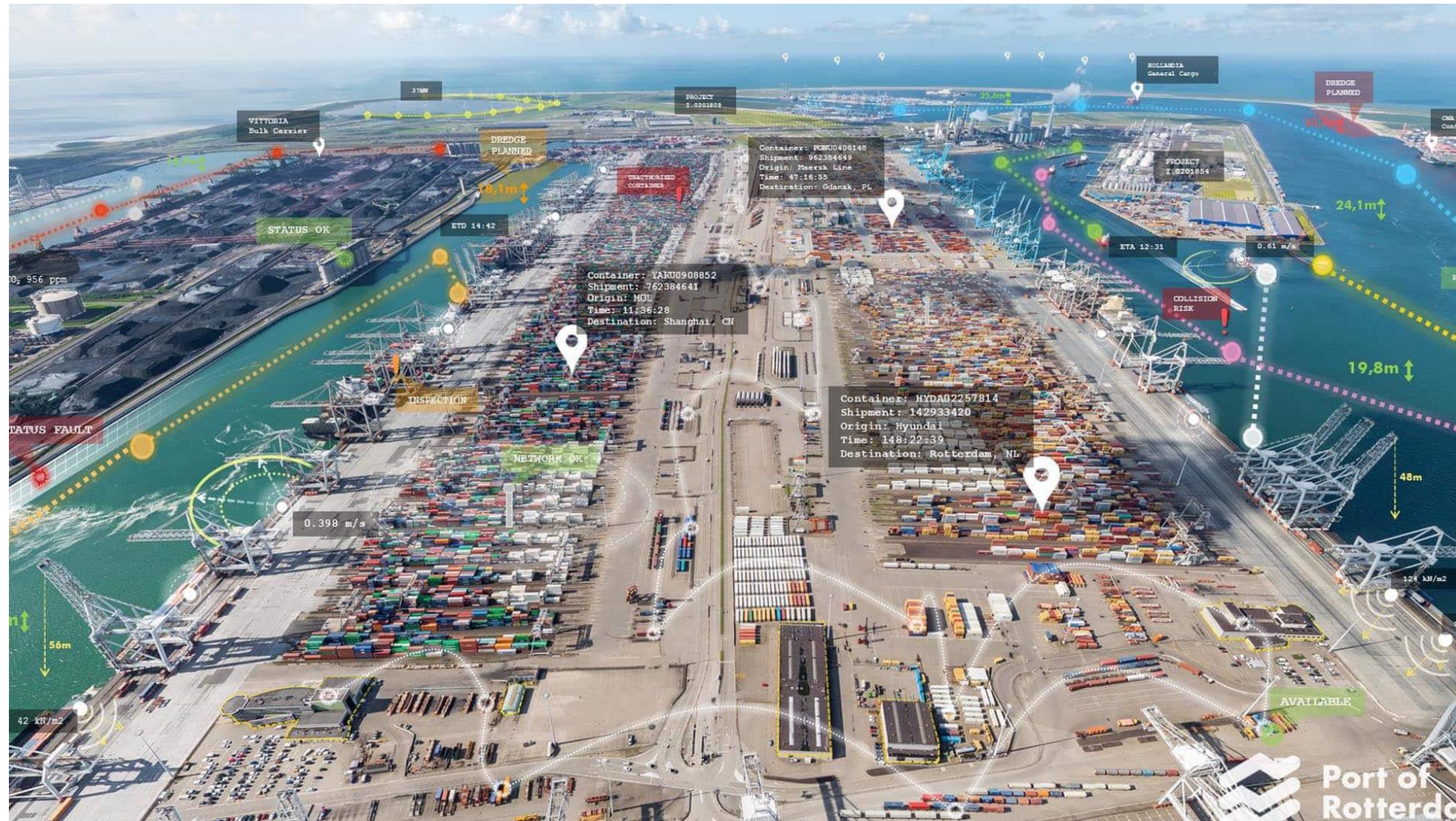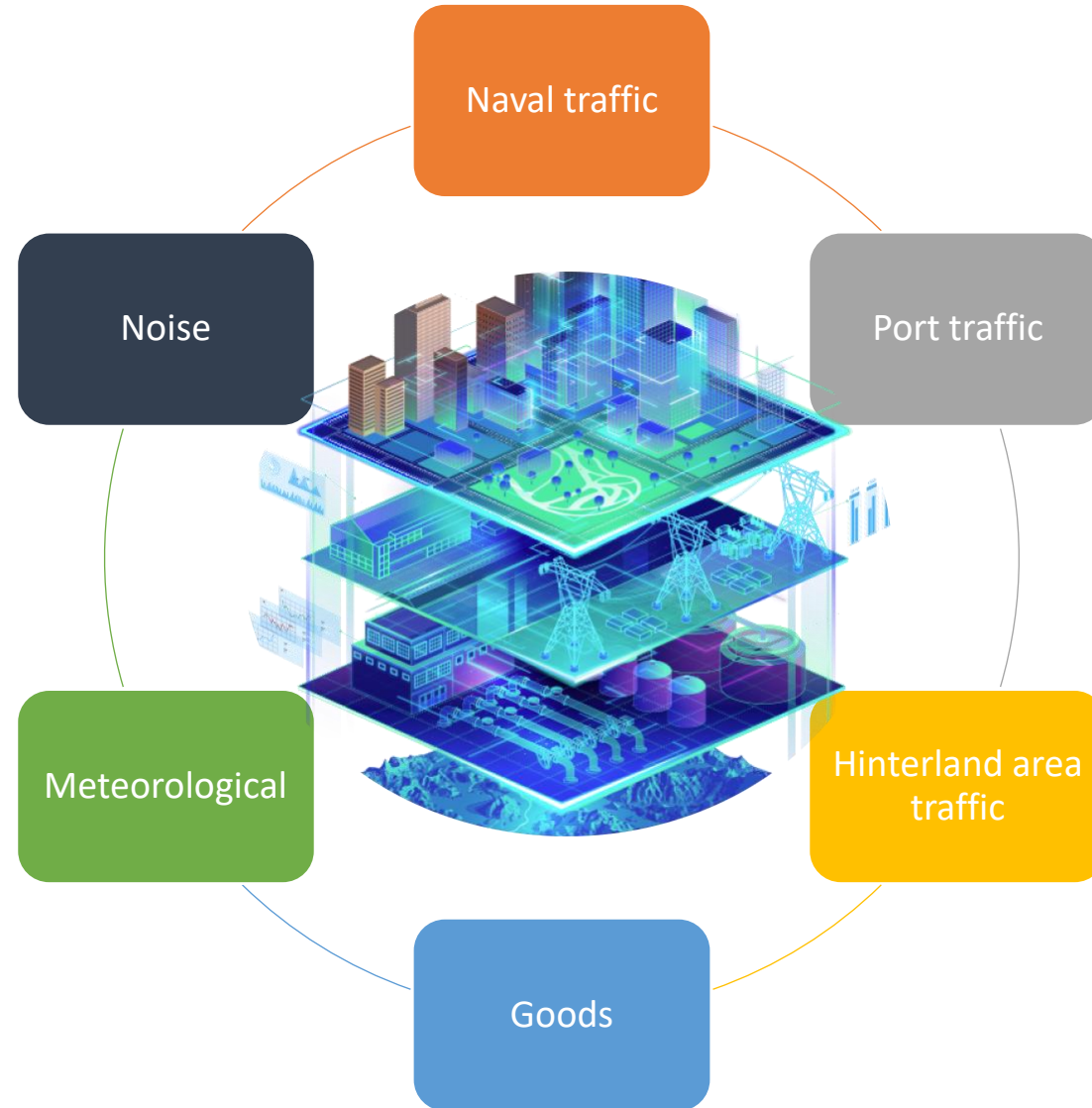
New environmental services with the C-ITS/1

The underlying technology employs advanced route optimisation algorithms and machine learning. These algorithms are powered not only by traffic data, but also by detailed demographic data to ensure that routes avoid densely populated areas. Scalability is ensured by a cloud infrastructure that allows real-time updates.
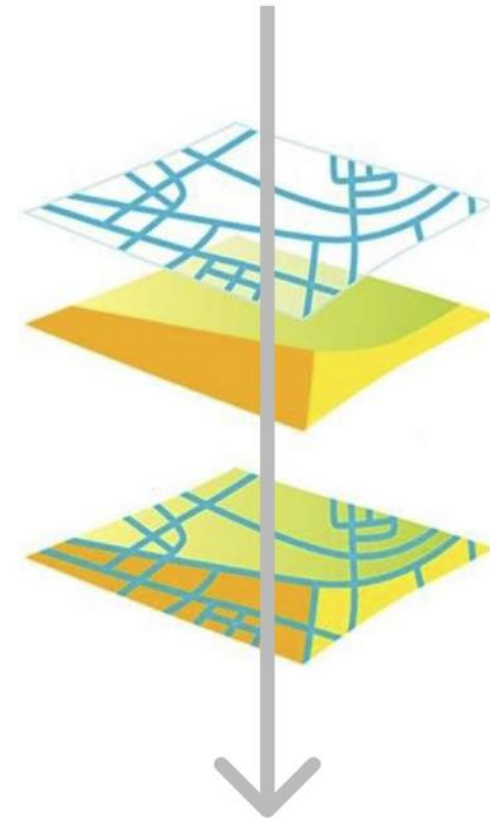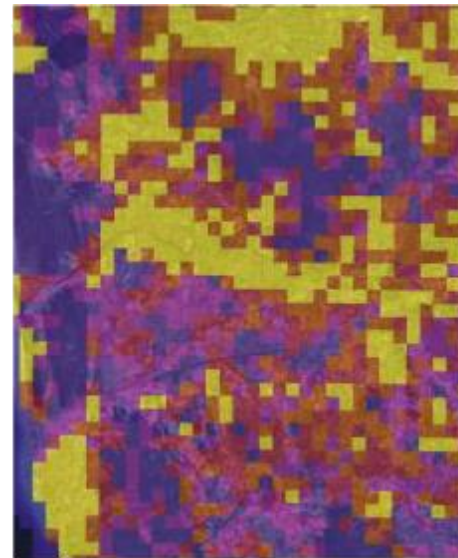
Thank you for attention!

Eng. Ivano Toni

Port Network Authority of the North Tyrrhenian Sea

Co-financed by the Connecting Europe
Facility of the European Union

Capitalisation workshop on multimodal activities
Ports of Trieste and Monfalcone

Livorno, 13th December 2023

Co-financed by the Connecting Europe
Facility of the European Union

Why do ports invest in digitalisation?

Physically connected

✓ Considerable financial investments

✓ Medium and long-term time frame

✓ Necessary to accommodate increasing transport demand

ICT integrated

✓ Relatively low financial investments

✓ Short and medium-term time frame

✓ Optimisation of existing assets and infrastructures

| Create a wide port community | Enhance port competitiveness | Increase attractiveness for potential investors | Improve environmental performance |

Planned IT developments with road transport

Extension of the PCS to the port of Monfalcone

Interoperability with national and neighbouring road operators

Advanced Analysis - Support System Decision (SSD)

Digital management of inbound and outbound road transport
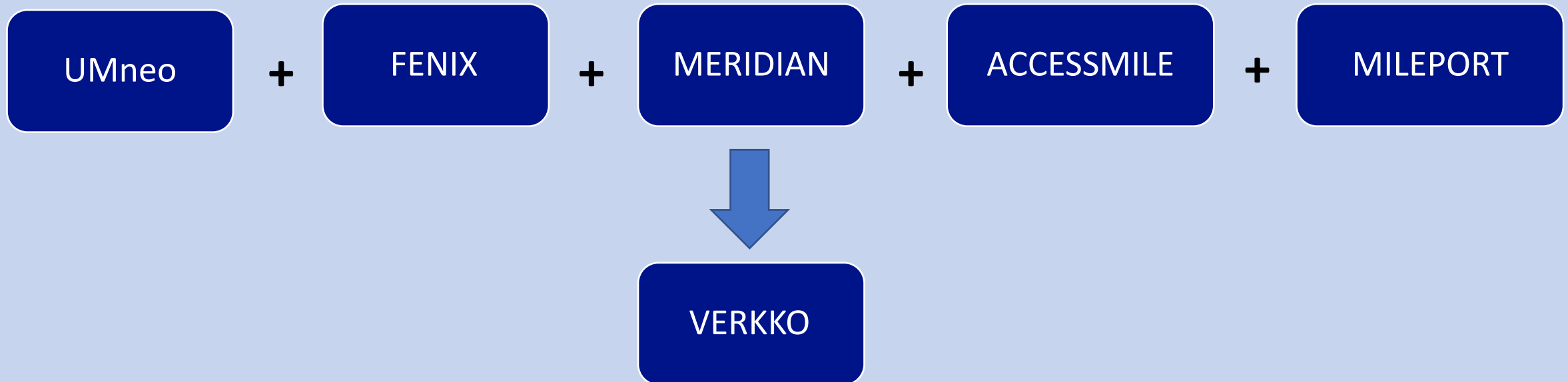
Ursa Major neo – Connecting Europe Facility

1. Interoperability with IT systems of motorway concessionaires through the installation of DATEX II nodes
2. New functionalities of the Port Community System:
   1. Pre-arrival notifications
   2. Gate automation

FENIX - Connecting Europe Facility

1. Development of an app devoted to the interaction with all port's stakeholders, especially road haulers
2. Upgrade of the IT components of the port gate system

Co-financed by the Connecting Europe Facility of the European Union

MERIDIAN - Connecting Europe Facility

1. Upgrade of the Port Community System:
   1. Development of the road haulier module:
      1. Pre-exit notification
   2. Extension of the PCS functionalities related to road to the port of Monfalcone
   3. Interoperability with AIDA (Customs Agency), also for the e-CMR

ACCESSMILE – Interreg Central Europe

1. Upgrade of the Port Community System:
    1. Development of the road haulier module:
        1. Slot booking management

→ Joint tender with MERIDIAN, to be launched in January 2024

Co-financed by the Connecting Europe
Facility of the European Union

MILEPORT – Interreg Italy-Croatia

The MILEPORT - *Improving the last MILE accessibility of Adriatic PORTs* project has just been funded, to start in January 2024, until June 2026. The Port of Trieste is LP, PPs being:

- Port of Trieste
- Port of Venice
- Port of Ravenna
- Port of Ancona
- Port of Bari
- Port of Rijeka
- Port of Zadar
- Port of Ploče
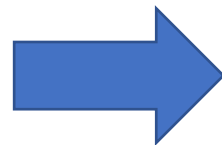
Focus on ICT applied to road last mile accessibility to ports

Cross-fertilisation opportunities with MERIDIAN

VERKKO – Connecting Europe Facility

The port of Trieste will develop its own GOS – Gate Operating System, a new IT system for managing the port gates, interoperable with the PCS and the other IT systems.

Thank you for your kind attention!

Alberto Cozzi
Port Network Authority of the Eastern Adriatic Sea

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Co-financed by the Connecting Europe
Facility of the European Union

ITS for the Port of La Spezia

Eng. Simone Pacciardi
Responsible of Relations with the EU, Strategic Projects,
Market Development and Intermodality unit

Livorno, 13th December 2023

ITS for the Port of La Spezia – Ursa Major neo and MERIDIAN projects

Issue: The Varco Stagnoni - La Spezia port entrance park is currently used for parking during the registration process for collection or delivery of containers while waiting for a call to access the terminal waiting for a withdrawal opportunity. The presence of congestion in the park can cause problems for the entire port operations chain as well as for city traffic.

Solution: The availability of traffic information in real-time helps the optimization of missions' scheduling by truckers, thus reducing the number of trucks coming to the port in case of congestion of the terminal or the gate entrance with the consequent phenomenon of queues

ITS for the Port of La Spezia – Ursa Major neo and MERIDIAN projects

The Ursa Major neo project in the La Spezia port dealt with:

- implementation of the Intelligent Truck Parking (ITP) core service within the area behind the gate entrance;

- integration with the port gate management system;

- implementation of a digital service that will provide information about the traffic and travel conditions along the road access to the port

Ursa Major neo – Intelligent Parking System – Phase 1
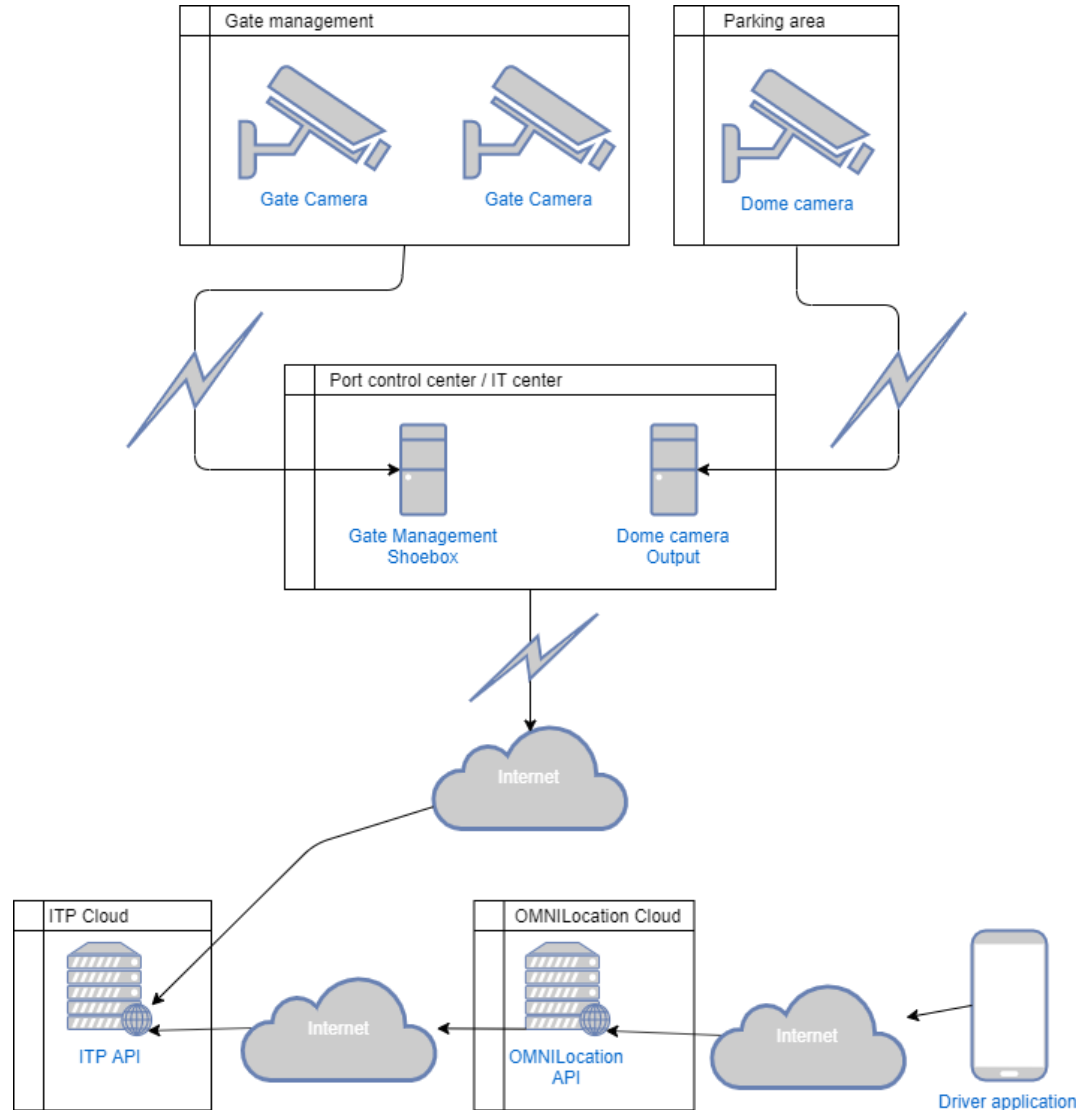
Monitoring system

The system is composed by the following hardware solution:

• Monitoring incoming traffic

• Monitoring outgoing traffic

• Monitoring parking spots

Port Control center / IT center
The system receives input from cameras and is able, through AI, to analyze the occupancy of parking spaces

Ursa Major neo – Intelligent Parking System – Phase 1

The design of the cabling connecting the cameras was optimized using the existing cable ducts.
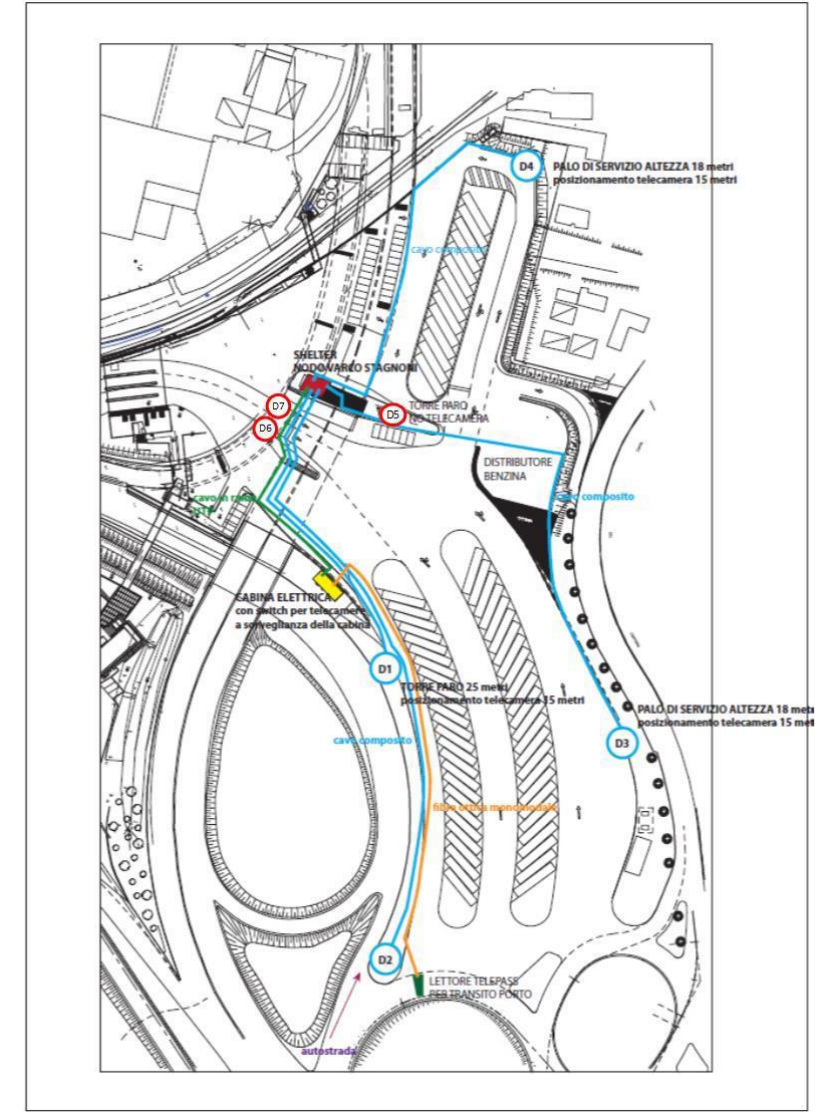
# Ursa Major neo – Intelligent Parking System – Phase 1

Tools: The mobile app allows the drivers who plan the gate-in to receive in real time information on the availability of parking spaces in front of Varco Stagnoni and, through the integration with the Port Community System, info about the operational availability / customs authorizations for containers in import or operational availability / VGM for containers in export.
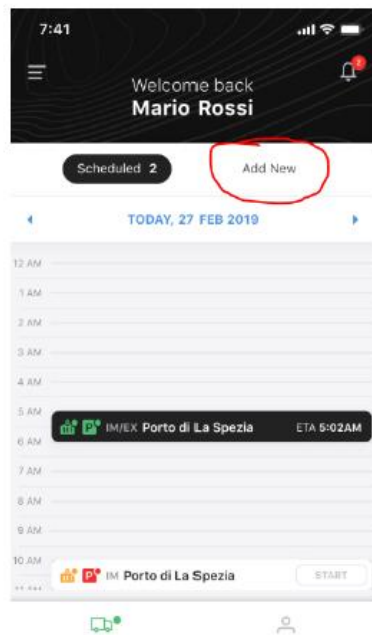
Add a new mission:
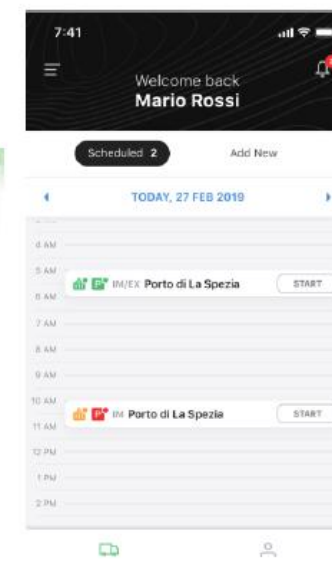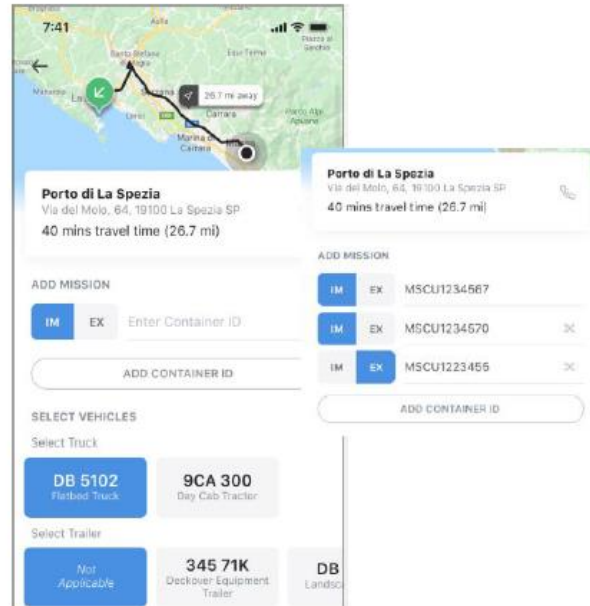
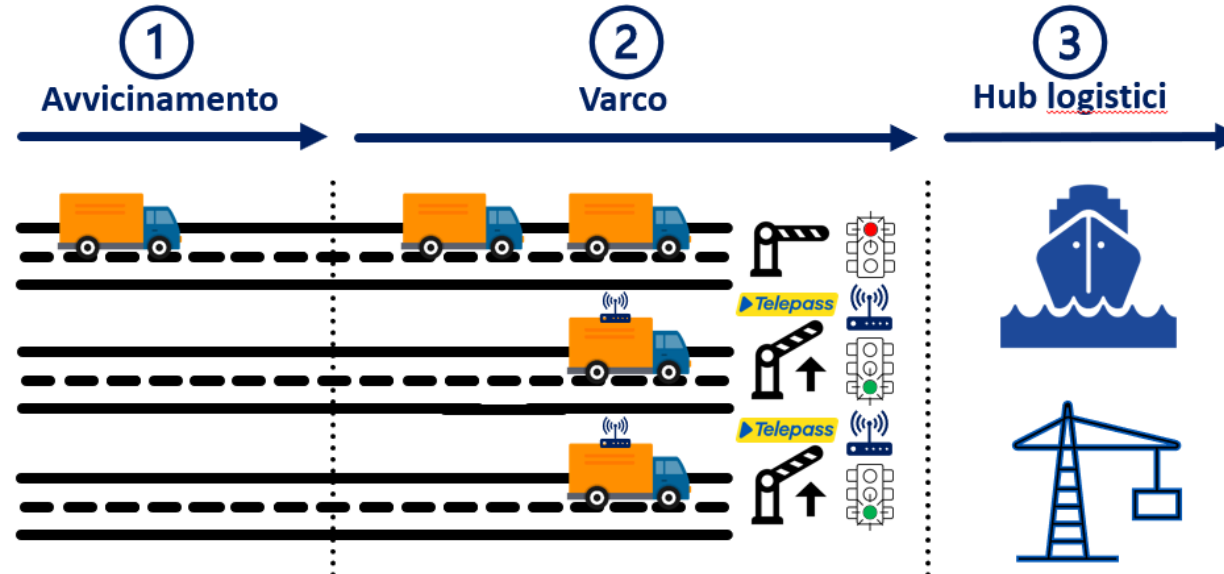View Scheduled Missions / Start a mission & send ET to port terminal:
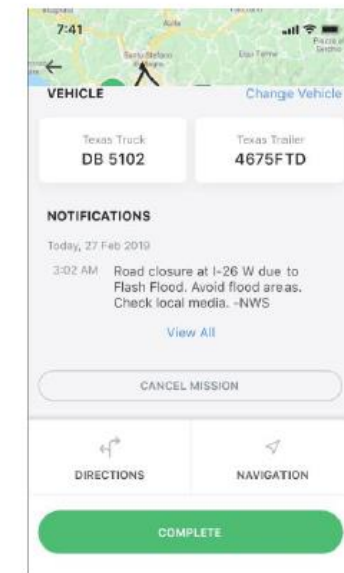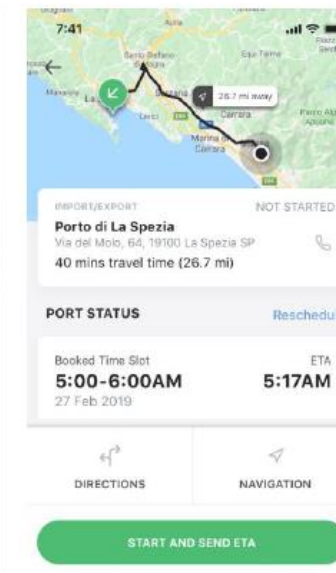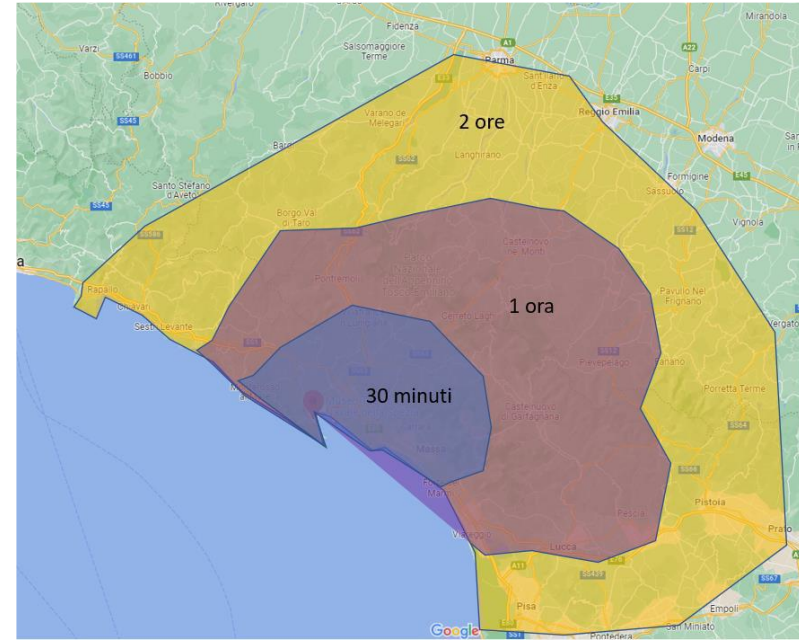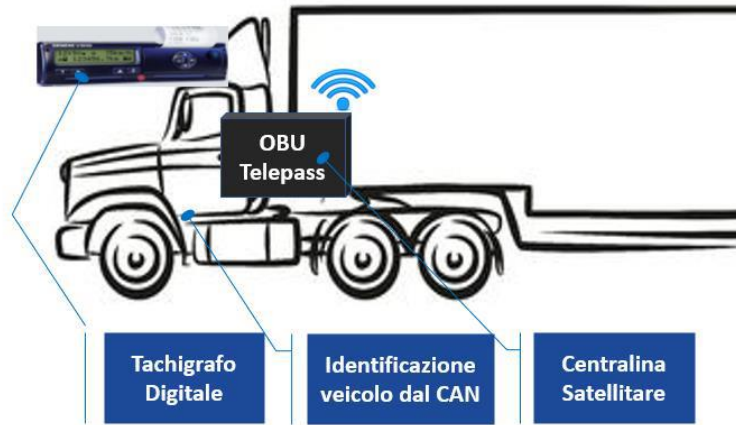
Get Notifications during travel to the port:

In order to meet the truck drivers' needs and reduce waiting time at the gate, the analysis demonstrated that the **app could be fed by a faster data entry system and integrated with the other platforms owned** by the Port Authority for allowing the entrance of trucks within the port of La Spezia.

For this reason, in October 2022, the phase 2 of the Pilot Project in La Spezia started with the implementation of new functionalities which will allow the Port Authority to have information about the **advance notice of the arrival of trucks** in order to better manage the activities for accessing the port and the terminal.

The system is fed by the **OBUs - On Board Units** already installed on many trucks coming to the port of La Spezia. After the involvement of vehicles identified among the road haulage companies coming frequently to the port of La Spezia, the system was tested in order to be integrated with the ERP of Road haulage Companies. The system is able to release the **ETA – Estimated Time of Arrival** for each truck equipped by the OBUs.

Ursa Major neo – Outbound Flows' detection system at La Spezia - Phase 2

While the second phase of the pilot action is running and results are shown to the port community, a Truck Federative Platform is under construction and is released in the same period.

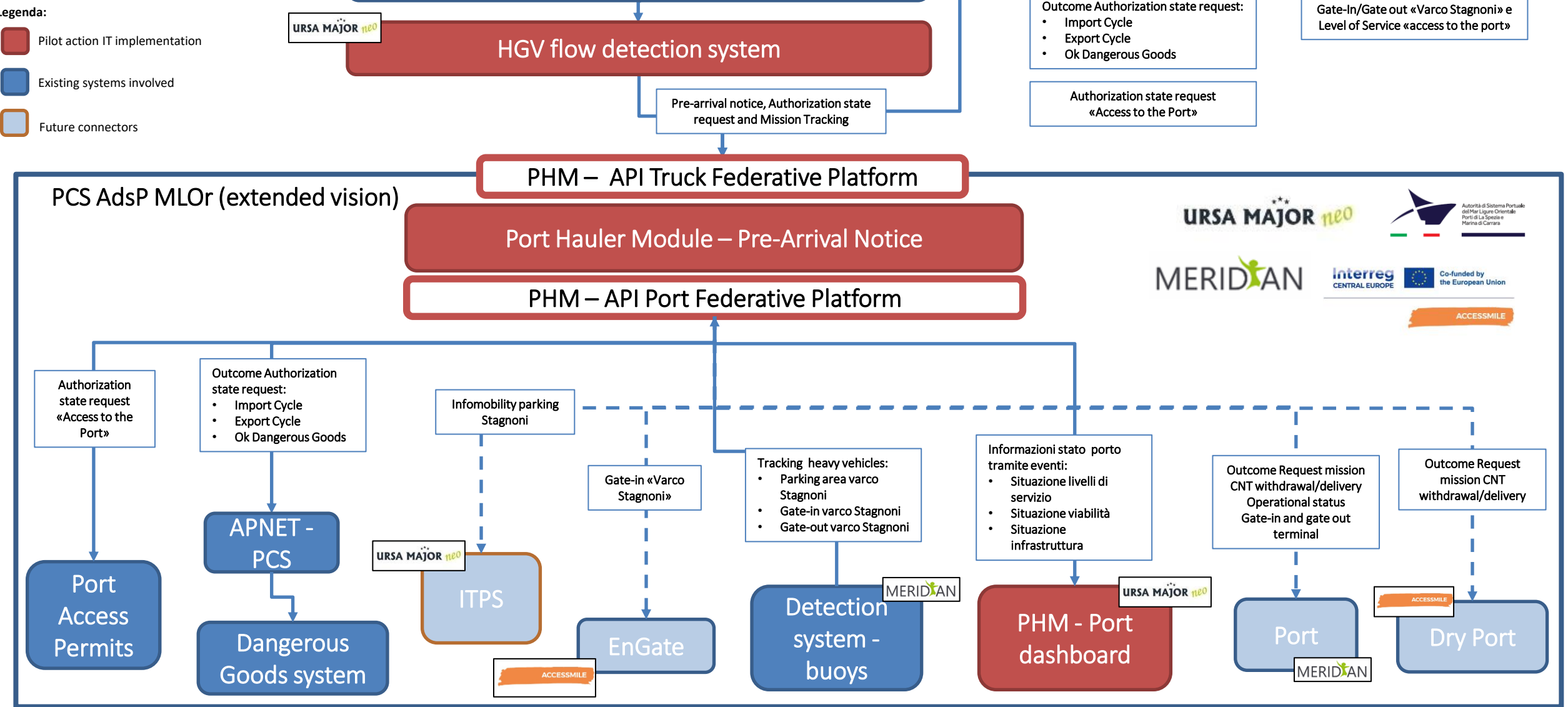# Ursa Major neo/MERIDIAN - Appointment system at the Port of La Spezia

Following the UMneo pilot action, the aim of the project is to implement an **appointment system** for trucks at the Port of La Spezia.

To load/unload a container from a terminal in the port is a process currently managed by many actors (Port Authority, Terminal Operators, Customs, Health Authority etc.) and the harmonization of the different systems should be enhanced.

The appointment system will be focused on a reliable system which allows the **digital exchange of information** between the actors involved in the process. The system will be an integrated solution for collecting **information about the availability of containers**, digitally secured and fully integrated with the actual IT platforms owned by the Port Authority and tools at drivers' disposal. The new solution is intended to speed up the process of releasing containers and make it safer and more efficient.
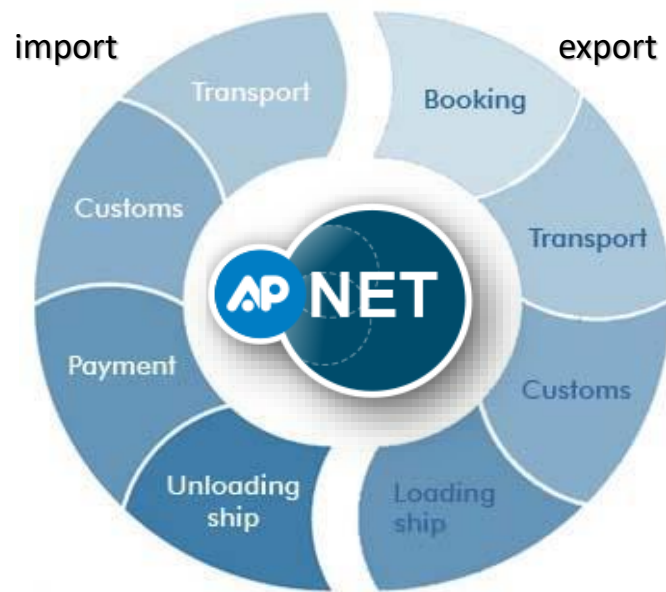
Ursa Major neo/MERIDIAN - Appointment system at the Port of La Spezia

Legenda:
- Pilot action IT implementation
- Existing systems involved
- Future connectors

Trucks Transport Companies IT platform

URSA MAJOR neo

HGV flow detection system

Pre-arrival notice, Authorization state request and Mission Tracking

PHM – API Truck Federative Platform

PCS AdsP MLOr (extended vision)

Port Hauler Module – Pre-Arrival Notice

PHM – API Port Federative Platform

Tutto OK per accesso

KO con specifica dei negativi

Outcome Authorization state request:
- Import Cycle
- Export Cycle
- Ok Dangerous Goods

Gate-In/Gate out «Varco Stagnoni» e Level of Service «access to the port»

Authorization state request «Access to the Port»

URSA MAJOR neo
Autorità di Sistema Portuale del Mar Ligure Orientale Porti di La Spezia e Marina di Carrara

MERIDIAN
Interreg CENTRAL EUROPE
Co-funded by the European Union

ACCESSMILE

Authorization state request «Access to the Port»

Outcome Authorization state request:
- Import Cycle
- Export Cycle
- Ok Dangerous Goods

Infomobility parking Stagnoni

Gate-in «Varco Stagnoni»

Tracking heavy vehicles:
- Parking area varco Stagnoni
- Gate-in varco Stagnoni
- Gate-out varco Stagnoni

Informazioni stato porto tramite eventi:
- Situazione livelli di servizio
- Situazione viabilità
- Situazione infrastruttura

Outcome Request mission CNT withdrawal/delivery Operational status Gate-in and gate out terminal

Outcome Request mission CNT withdrawal/delivery

APNET - PCS

URSA MAJOR neo

ITPS

ACCESSMILE

MERIDIAN

URSA MAJOR neo

ACCESSMILE

Port Access Permits

Dangerous Goods system

EnGate

Detection system - buoys

PHM - Port dashboard

Port

MERIDIAN

Dry Port

MERIDIAN   URSA MAJOR neo

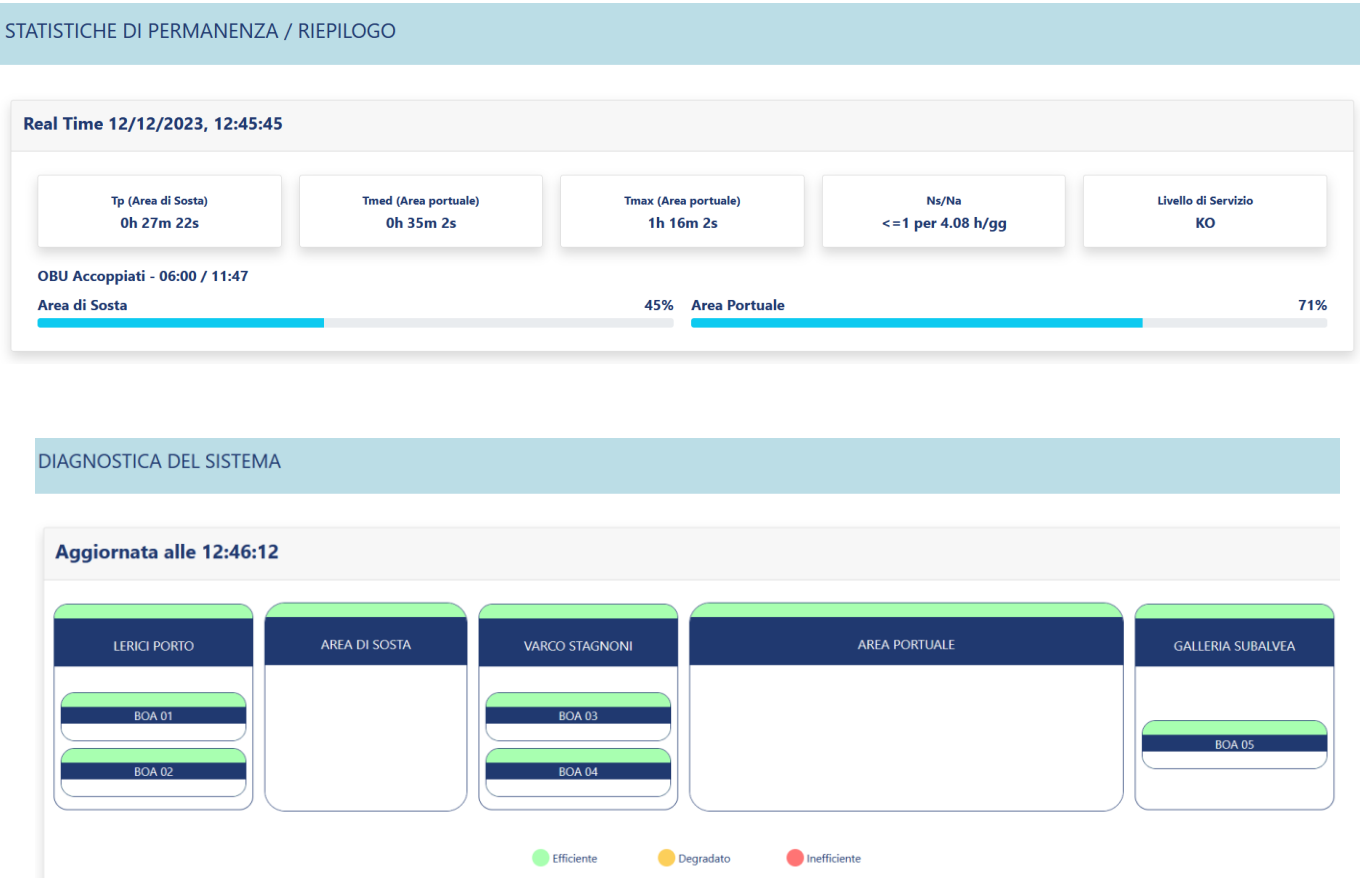# Ursa Major neo/MERIDIAN - Appointment system at the Port of La Spezia

This solution expects to be a neutral, **central data platform** that brings together all stakeholders involved in the container import/export process.
Integrated with the IT platform of the port community **PCS APnet**, it will also be possible to monitor who took part in the container handling, improving the *Level of Service (LoS)* at the port entrance and in the whole process.

MERIDIAN – Inbound flows detection system

Monitoring the **Level of Service (LoS)** at the port entrance and in the whole process thanks to physical buoys installed at the gate entrance and exit of the port.

In the light of the criticalities identified by the port community, this project aims to implement a set of services offered by the HGV flow detection system, interoperable with the Port Authority IT systems, which allows:

1. ***the Truck Companies*** which operate in the port of La Spezia to:
   a. share in advance and in an automated way with the Port Authority IT systems some information related to the truck missions in order to anticipate the checks in terms of security (permits) and authorizations (Terminal access), anticipating the «Arrival Notice» (30', 1 hour/2 hours....) and with the passage of the vehicles through the so-called «Virtual Temporal Gates», the supply of a configurable ETA (of 10 minutes);
   b. to receive the outcome of the authorizing controls (permissions and operating data of access to the port and the terminal) carried out from the Port Authority IT systems in order to be able to manage in time eventual KO (no data available) before the arrival of the means to the terminal.

2. ***To the Port Authority*** to receive in advance the information of the transport/ truck missions arriving at the port with the Estimated Time of Arrival (with update every 10' minutes), so as to:
    a. ***carry out in advance authorisation checks on its own systems*** (access permits and operational data) with regard to the planned travels received by truck drivers and be able to send feedback to them, through trucks' systems;
    b. ***manage potential congestions in advance*** at the parking area in front of the Stagnoni gate, the port area and the related access routes.

3. ***To the Gate operators and to the Terminal*** to receive in advance the ***«advance notice of arrival»*** and the information of the transport/ truck missions with the Estimated Time of Arrival (ETA), so as to be able to preview/manage in advance also possible peaks of traffic

Autorità di Sistema Portuale
del Mar Ligure Orientale
Porti di La Spezia e
Marina di Carrara

ACCESSMILE - Appointment system at the Port of La Spezia

Project overview

The ACCESSMILE project improves the accessibility of rural or peripheral regions regions with the networks. To this end, the partners pilot new strategies and action plans to optimise IT processes related to transport flows, gates and cargo bundling.

The port of La Spezia is involved in Topic 2: *gates and entry/exit tools and procedures, accessibility of rural and peripheral area in CE to the main freight nodes of TEN-T networks and elaborating a transnational strategy to improve it.*

In particular, the pilot action forecasted in ACCESSMILE will implement systems useful to detect data provided by the road haulage companies at the port gate **through innovative system already installed at the port gates** (i.e. OCR cameras, intelligent parking detection system).

VERRKO – Future developments

The development of a **C-ITS dashboard** for managing and controlling the traffic within the port of La Spezia will be an important tool to release real-time information on congestion events or other accidental events present in the port area and its surroundings

This tool can be fed **by a series of web services** to inform on the state of the road in particular points of the port domain and access roads. Of particular interest are the info about Traffic Incidents, which provide real-time information on traffic jams or road accidents, and Traffic Flow which provides real-time information on speed and travel times.

Integrated with the **Truck Federative Platform** of the port community PCS in La Spezia and with **Geographic Information Systems**, it will also helpful to monitor who took part in the container handling, improving the Level of Service (LoS) at the port entrance and in the whole process.
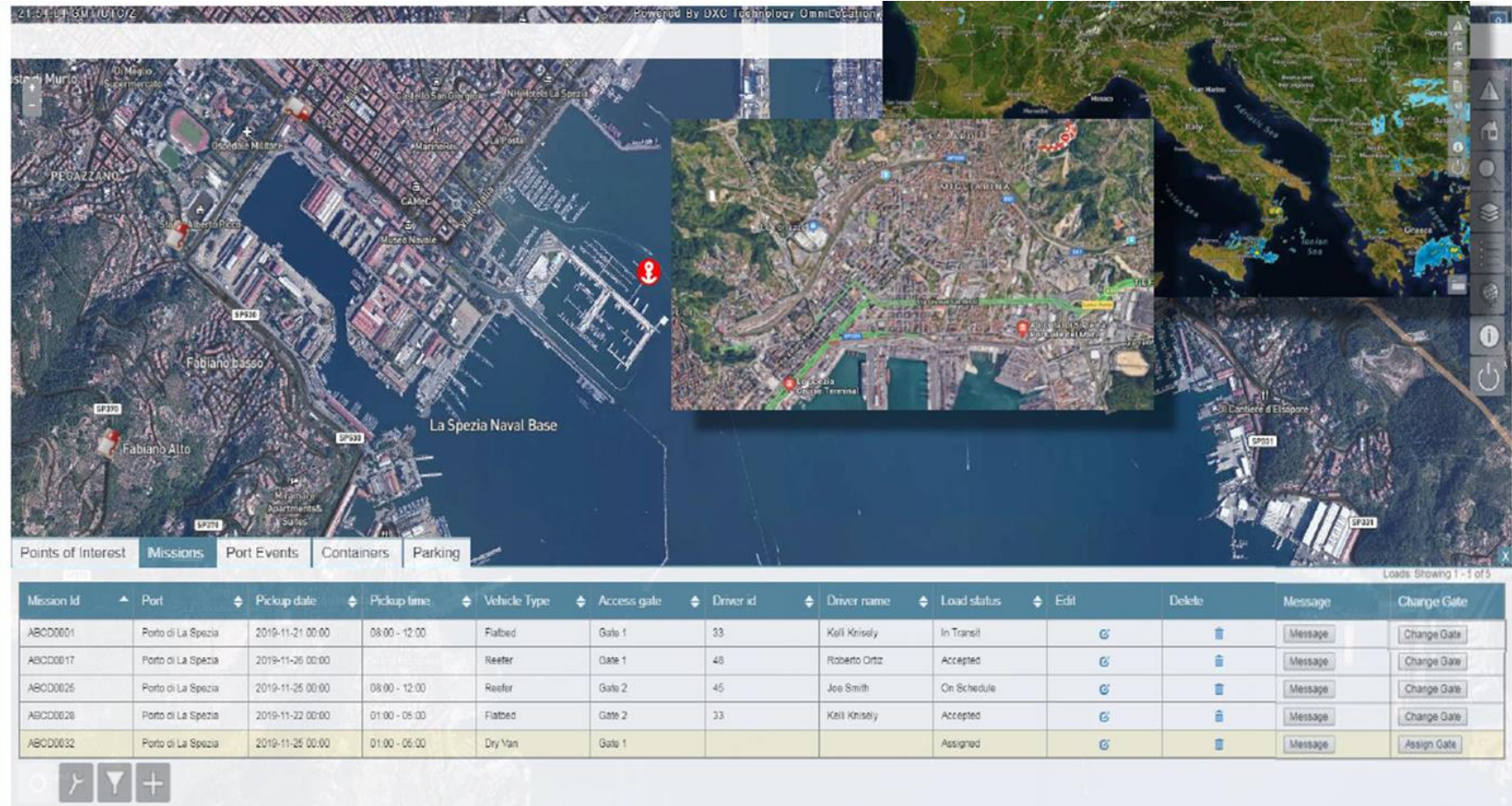
MERIDIAN URSA MAJOR neo

Autorità di Sistema Portuale
del Mar Ligure Orientale
Porti di La Spezia e
Marina di Carrara

VERRKO – Future developments

ITS for the Port of La Spezia

Eng. Simone Pacciardi
Responsible of Relations with the EU, Strategic Projects,
Market Development and Intermodality unit

Livorno, 13th December 2023

Multimodal Activities Workshop

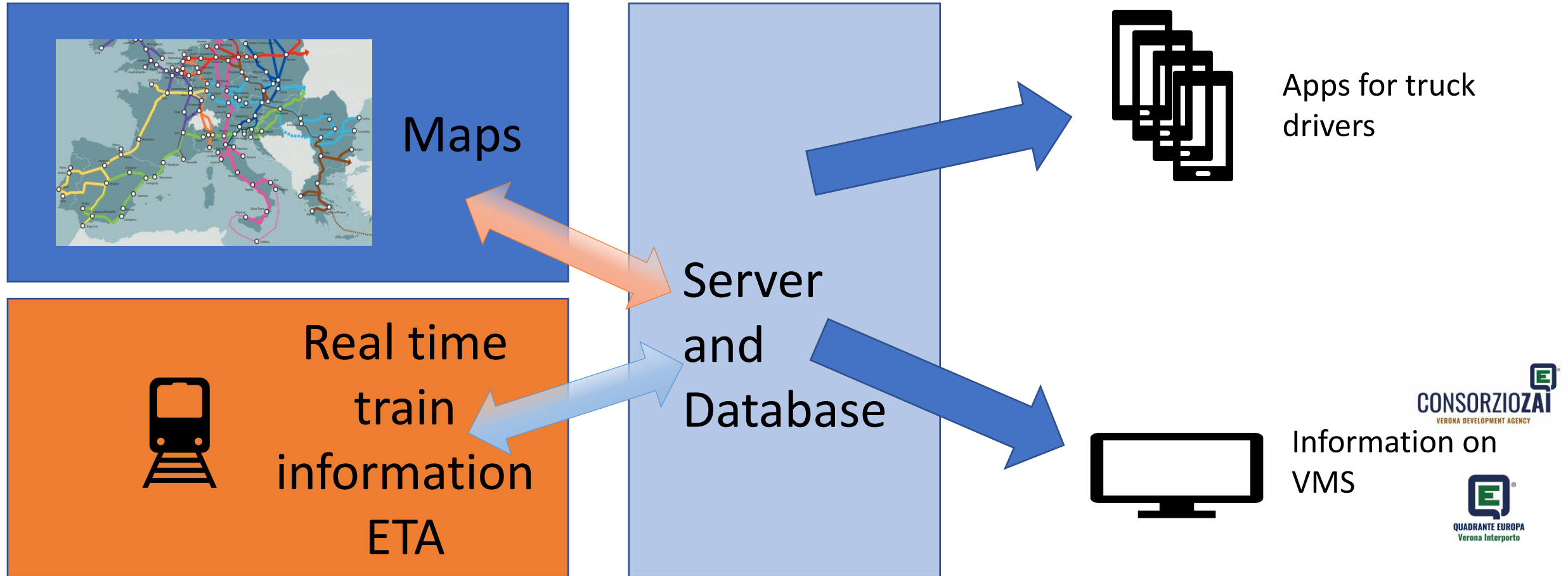ICT Empowerment in Verona Quadrante Europa RRT

Consorzio ZAI

Alberto Milotti

Objectives of UMNeo Implementations - 1

▶ The increasing number of HGV arriving every day in the Verona freight village area are creating several viability problems. It is necessary to give a prompt communication about the internal and external events happening in the area.

▶ Currently the freight village of Verona does not receive information from the close motorways, so it is not possible to avoid the road congestions when there are problems on the network (e.g. accidents).

▶ The railway terminal managers (Terminali Italia and Quadrante Servizi) find difficult to operate in congested areas. Therefore, the queues of heavy vehicles on the roads outside the terminal gates can block the railway operations.

Co-funded by the European Union

Objectives of UMNeo Implementations - 2

▶ A new concept of truck parking area has been assessed and new technical specifications has been evaluated to be adopted in the existing area, in order to create a "buffer area" where the truckers can wait the delayed trains or make a stop if there are bottlenecks within motorways.

▶ Information has to be shared with truck drivers besides other innovative services

Co-funded by
the European Union

UMNeo Activities

Maps

Real time train information ETA

Server and Database

Apps for truck drivers

Information on VMS

Co-funded by the European Union

Implementations

- Datex II: implementation of road event management system

- Preliminary design of Smart trucking parking area (S-SSTPA)

- TOS: Final design (and implementation) of terminal operative system

Implementations and evaluations

▶ The DATEX node should contributed to the reduction of the idle HGV times, allowing the drivers to improve the daily trips number, adding business value.

▶ In September 2019, the software house has installed the DATEX server inside the Quadrante Servizi premises.

▶ In November 2019, we completed the connection of our DATEX server to the information system of the A22 motorway.

▶ It will possible to add useful motorways traffic warnings and information to the VMS placed inside the freight village, providing real-time information to the vehicles travelling inside the RRT area, moving a part of these vehicles onto alternative routes.
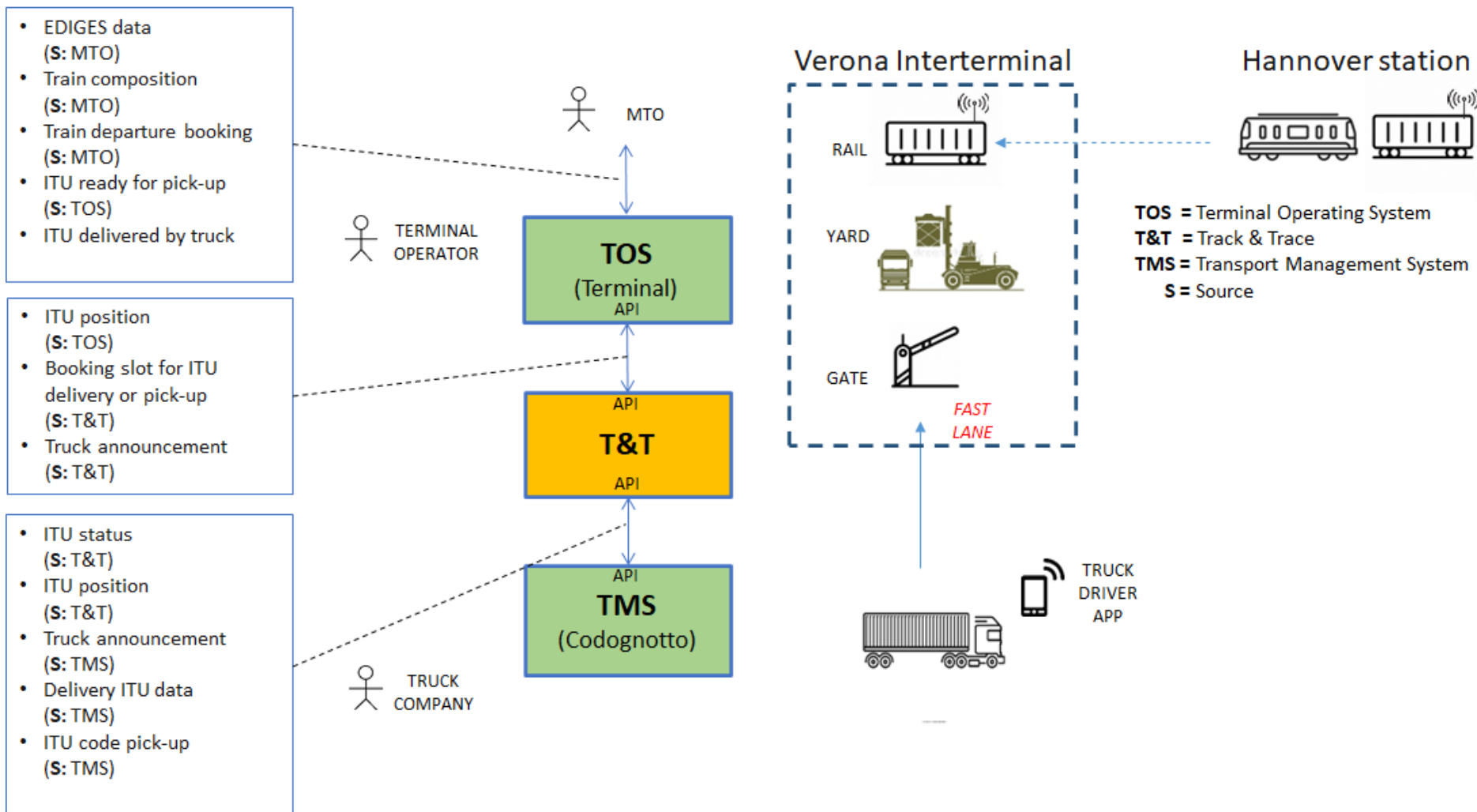
MERIDIAN – 4 tasks to empower ICT in Verona QE

▶ Updating and strengthening of the optical fiber coverage

▶ Replacement of the active network devices (DWDM/MPLS)

▶ Modernization of the cloud infrastructure

▶ Upgrading of the Security system at the gates

Other projects – FEDERATED

Other projects (not contracted yet)

▶ Within the Italian Recovery and Resilience Plan we are going to implement a Framework Project promoted by Italian Association of FV (UIR), under the cohodination of RAM (IT Ministry of Transport) which main activities are:

  ▶ Developing/implementing/updating TOSs
  ▶ Cybersecurity Equipment/Solutions
  ▶ Develop a Connector (at National Level) with Italian Logistics Platform

Co-funded by
the European Union

VERKKO – Proposal

▶ The project aims to implement cameras in the Freight Village areas in order to monitor safety level and manage it as better as possible, to manage traffic flows within the Freight village areas (forwarding center, terminal, public roads, etc), and to manage safety in the truck parking areas.

▶ The Cameras will be connected to the "control Tower"

▶ A special target will focus on Interterminal: new cameras will help a better management of the TOS (Terminal Operating System)

Task 5.01 Data Hub (further development of **MobiData BW ®** platform)

Task 5.02 new Mobility Centre of Baden-Württemberg

Multimodal mobility = many partners

How?

Safe?

Quality?

Bild: Stadtwerke Konstanz

When?

Bild: SSB AG

Bild: Bosch eBike Systems

Bild: QIMBY CCO 1.0

...huge amount of mobility data

On time?

Where?

Available?

Bild: NVBW

Bild: Robert Bosch GmbH

Bild: ENBW AG

Free in 30 min?

Bild: Tier Mobility

Co-financed by the Connecting Europe
Facility of the European Union

Multimodal mobility = many partners

MobiData BW –
integration platform for mobility data in
Baden-Württemberg

When?

How?

Quality?

On time?

...gre

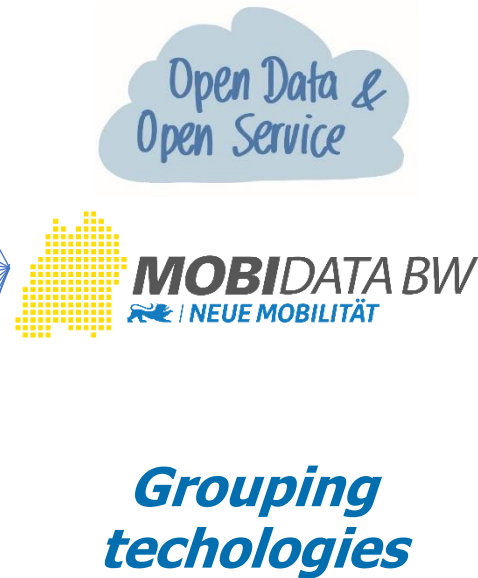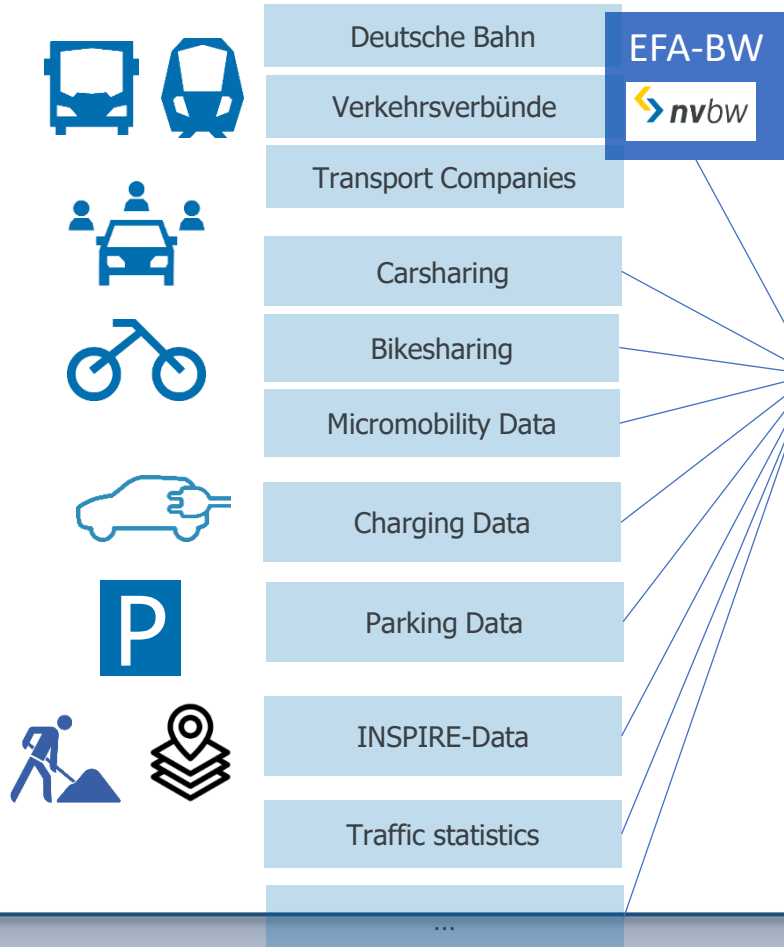able?

Bild: Stadtwerke Konstanz

Bild: NVBW

Bild: Robert

Bild: Tier

Co-financed by the Connecting Europe
Facility of the European Union

Turning Data into Practice and Services

MERIDIAN
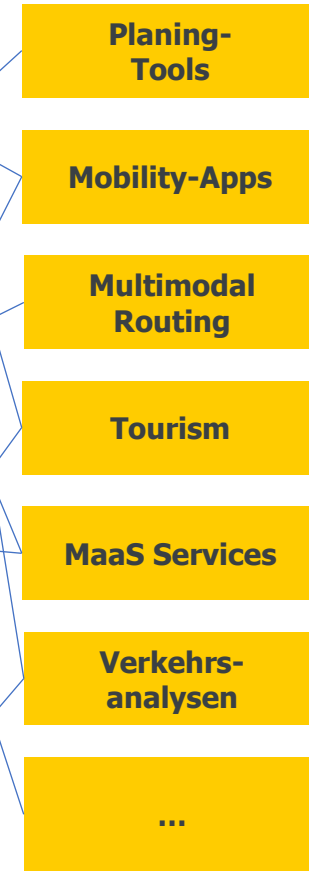
Mobility Data

- Deutsche Bahn
- Verkehrsverbünde
- Transport Companies

EFA-BW
nvbw

- Carsharing
- Bikesharing
- Micromobility Data
- Charging Data
- Parking Data
- INSPIRE-Data
- Traffic statistics
- ...

Open Data & Open Service

MOBIDATA BW
NEUE MOBILITÄT

Grouping techologies

Users

- Cities
- Mobility-Serviceproviders
- Economy
- Research & Development

application

- Planing-Tools
- Mobility-Apps
- Multimodal Routing
- Tourism
- MaaS Services
- Verkehrs-analysen
- ...

QGIS
stadtnavi
MobiWert
raumobil
bwegt
Mobilität für Baden-Württemberg
Freizeit AMPEL Baden-Württemberg
FIX MY CITY
DAI-Labor TU Berlin
PARCONOMY

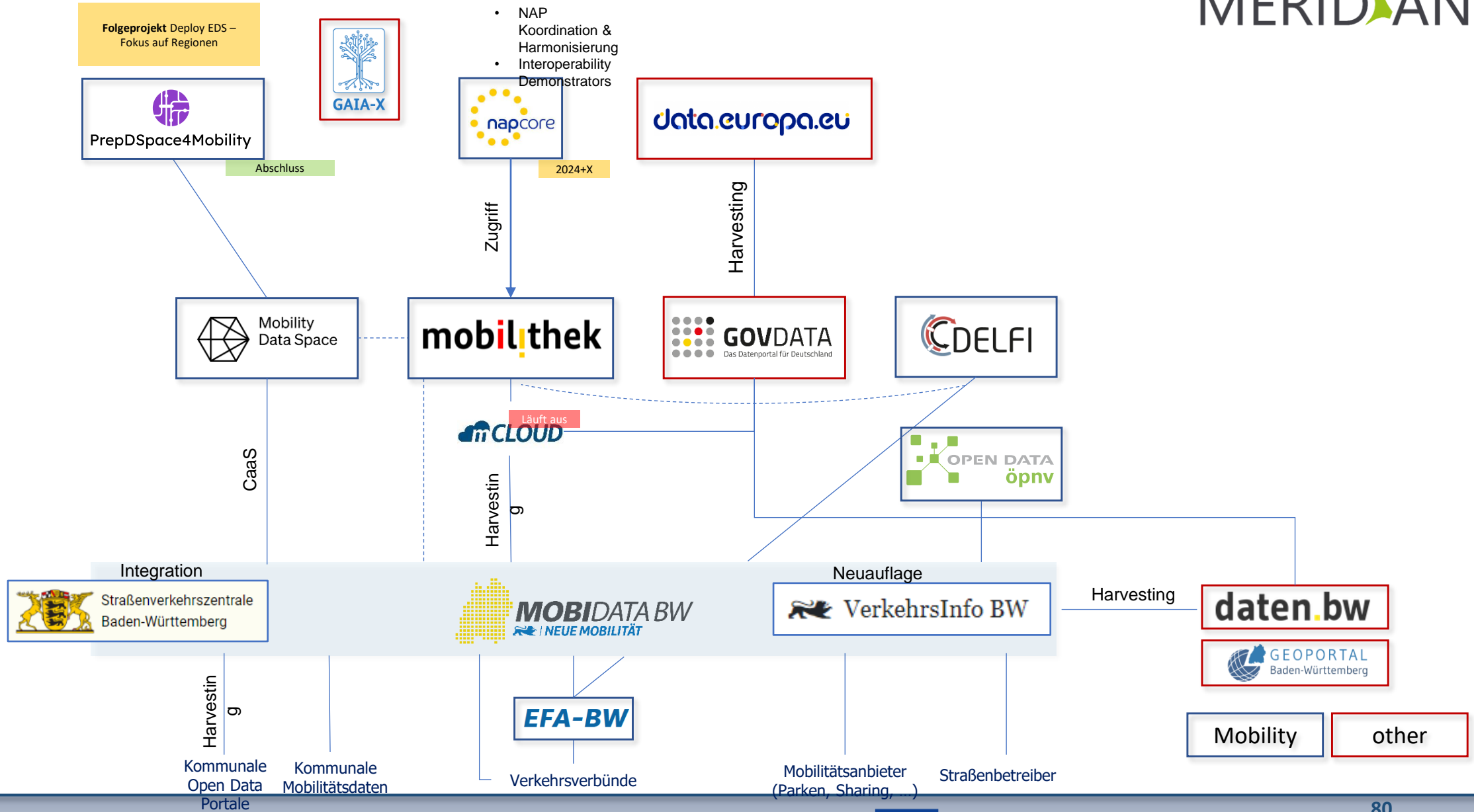# Connected platforms

MobiData BW
Open mobility data in Baden-Württemberg – characteristics

1) Open mobility data platform
for multimodal mobility information

2) Open services that are based on
the platform's data

3) Open knowledge network in order
to support and consult cities and
municipalities on data-driven mobility
solutions

MobiData BW
Open mobility data in Baden-Württemberg - advantages

1) **It´s completely free**
everybody can use it, espc. cities

2) **Generating services**
for multimodal, connected,
sustainable mobility

3) **Fulfulling delegated regulations**
connecting different platforms: NAP,
MDS (EMDS), GovData

MobiData BW
Open mobility data in Baden-Württemberg – lessons learned

1) Connected to UMneo tasks
BEMaS
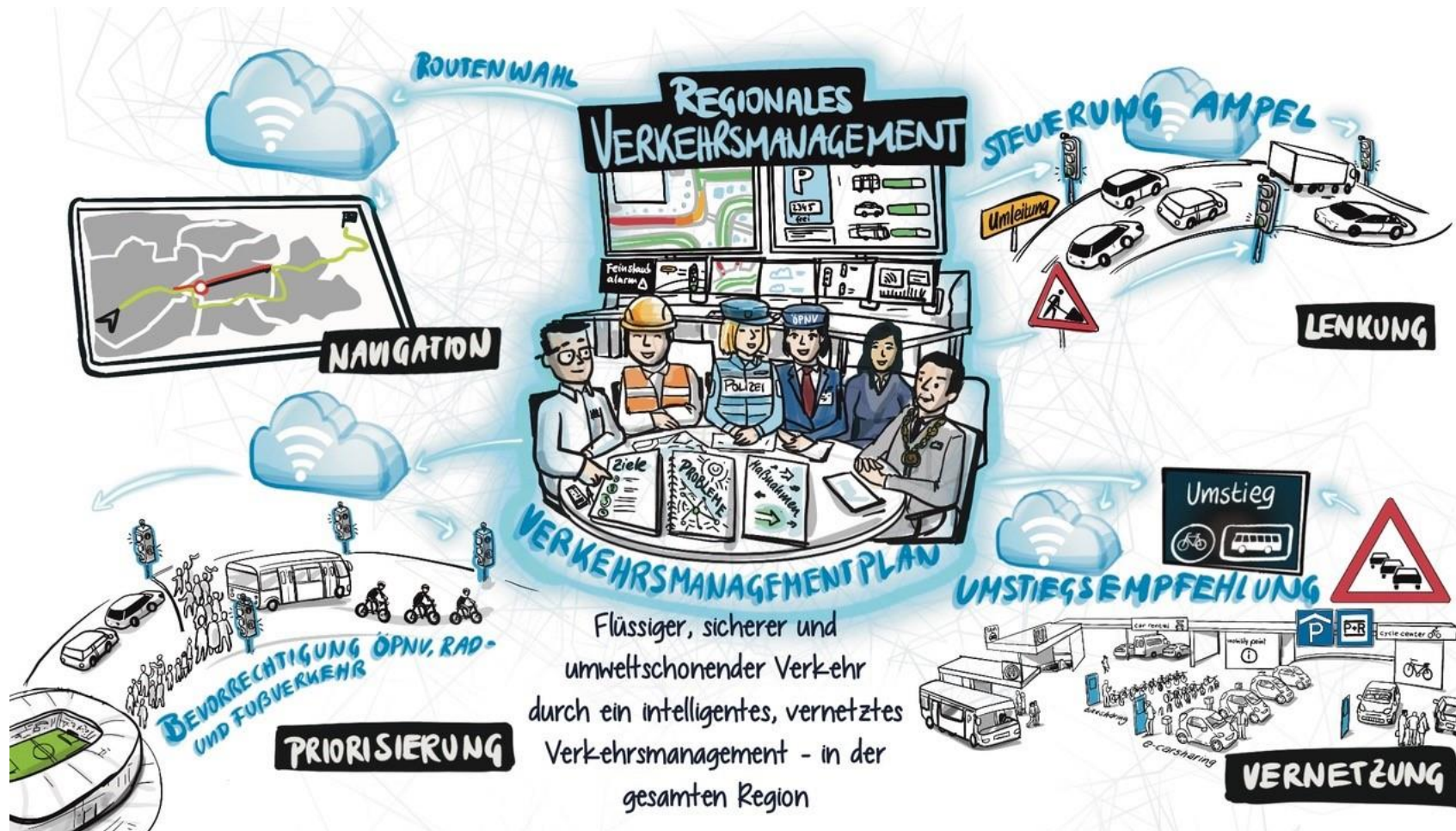
2) Allembracing services
skipping the fields of responsability

3) Intense communication
bringing the information to the people

Our Vision: Cooperative Traffic Management

Traffic Management Centre for Baden-Württemberg
combined traffic management – basics

1) Launch in 2027
estd. Costs ~ 12 Mio. Euros
MERIDIAN supports the development of a
cooperative traffic mgt. software

2) Missions
central monitoring of 45 tunnels
monitoring of intelligent transportation systems
cooperative traffic mgt. in urban areas

Traffic Management Centre for Baden-Württemberg
combined traffic management – characteristics

1) **One central solution for the whole state**
for intermodal traffic management

2) **Intelligent transportation systems**
increasing road safety and efficiency

3) **Open knowledge network** in order to support
and consult cities and municipalities on data-
driven mobility solutions

Thank You.

Michael Trees

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FRONTIER
FUTURE MOBILITY

Studying the application, the synchromodal transport concept for the hinterland of the Port of Antwerp-Bruges

Mylena Cristine Rodrigues de Jesus, Emma Ceulemans, and Edwin van Hassel
University of Antwerp

Meeting 13th of December 2023

Outline of the presentation

- **What is Frontier**

- **Setting the scene of the pilot**

- **ANTME in Antwerp**

- **Pilot runs**
  - **First phase (finalized)**
  - **Second phase (ongoing)**

- **Main take aways**

The Frontier project

the EU-funded project <u>FRONTIER</u> considers (in the case of Antwerp) how Traffic Management Partnerships between network operators (Flemish waterway Authority and the Flemish traffic centre) might contribute to better traffic management and the alleviation of congestion.

For example, the coordination between the waterway and roadway management in the Antwerp Pilot case could shift part of the freight cargo from the road to the water.

From this, it is expected to light up the waterway transport fortifying this more sustainable mode, reducing road traffic and congestion improving its flow and speed, among others.

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Pilot setup and orchestration in Antwerp

- **University of Antwerp** as coordinator.

- **De Vlaamse Waterweg** and **Verkeerscentrum** as contributors.

- The pilot simulates the freight modal shift from the road to the inland waterway: **the E313 highway and the Albert Canal**.

- Multiple objectives
  - Assess the impact of shifting containers from the road to inland waterway transport on the network in case of events
    - Which strategies might stimulate this shift?
 - Test the use of ANTME

- This case study will be developed via a **simulation**, in which we will consider the **effects on the network of shifting containers from the road to inland waterways in case of events.**
  - Therefore, coordination between road and waterway network operator is essential.
  - → alleviating congestion

- Different **use cases** will be simulated in the Antwerp pilot.
  - E.g., incident, recurrent congestion, etc.

- For these use cases, different **response plans** can be proposed.

FR NTIER
FUTURE MOBILITY
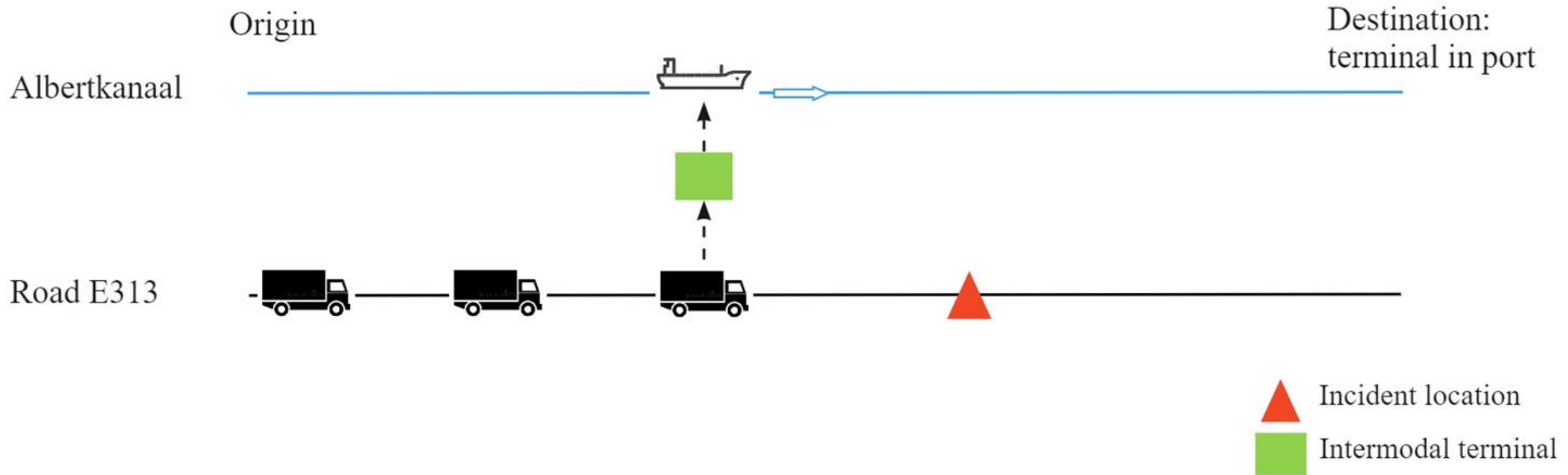
Pilot setup and orchestration in Antwerp

- Simulation results are incorporated in the central application: **ANTME**

- ANTME = **A**utonomous **N**etwork and **T**raffic **M**anagement **E**ngine
  - Assembling and providing information and response plans in case of events
  - Integrated in a Mobile App (or platform) that freight operators can use

FRONTIER
FUTURE MOBILITY
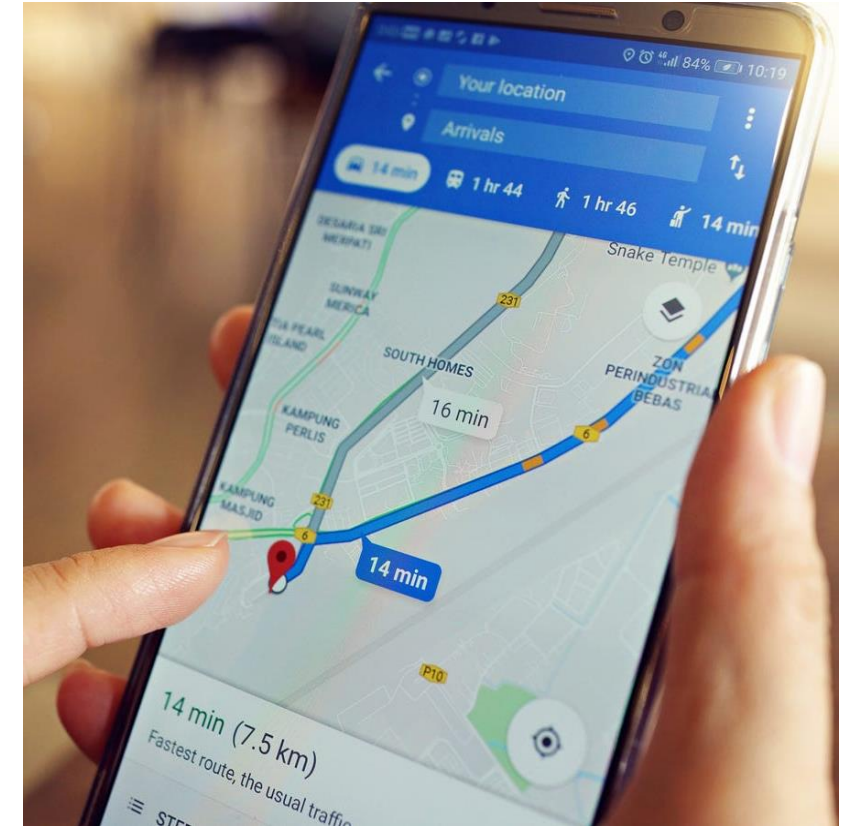
Pilot setup and orchestration in Antwerp

- The simulation will be run in 2 iterations:

  - **Phase 1:** *Focus on the* **supply** *side – what is the impact on the network?*
    - Scenarios constructed in **agreement** with Verkeerscentrum and DVW
    - The **simulation model** is developed, implemented, and calibrated within the project
    - Model is **validated** by the **traffic operators** and other stakeholders

  - **Phase 2:** *Focus on the* **demand** *side – which demand dynamics play a role?*
    - Strategies to **encourage freight operators** to accept the proposed plan.
    - Agent-based model is constructed to captures the rationale and utility of transport operators
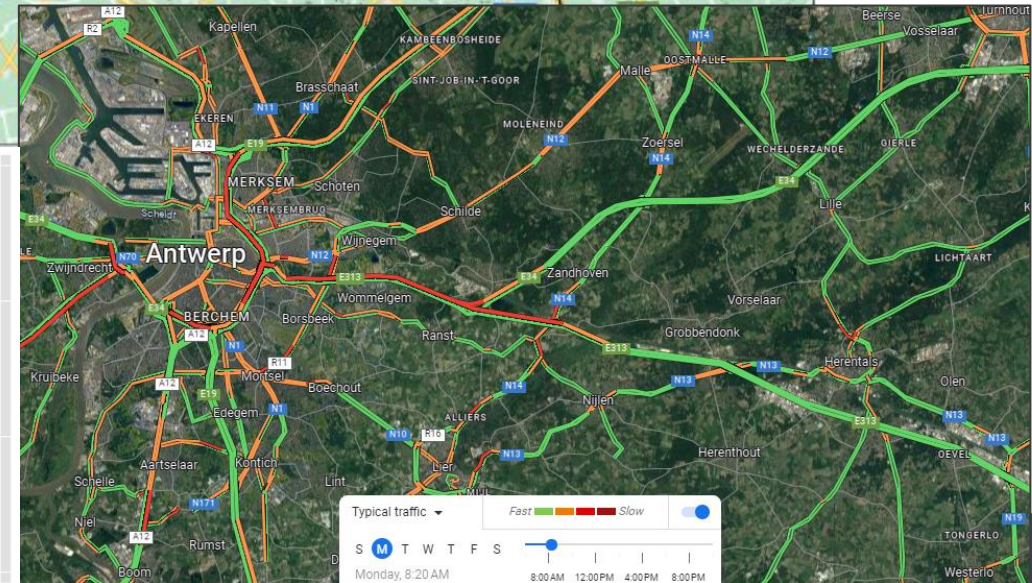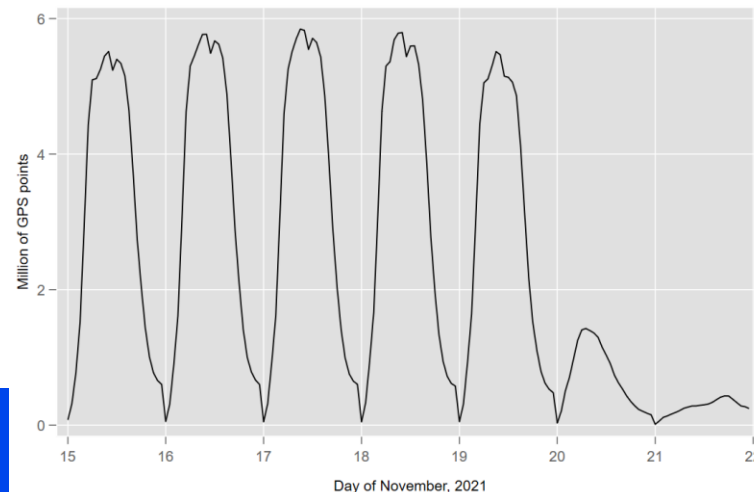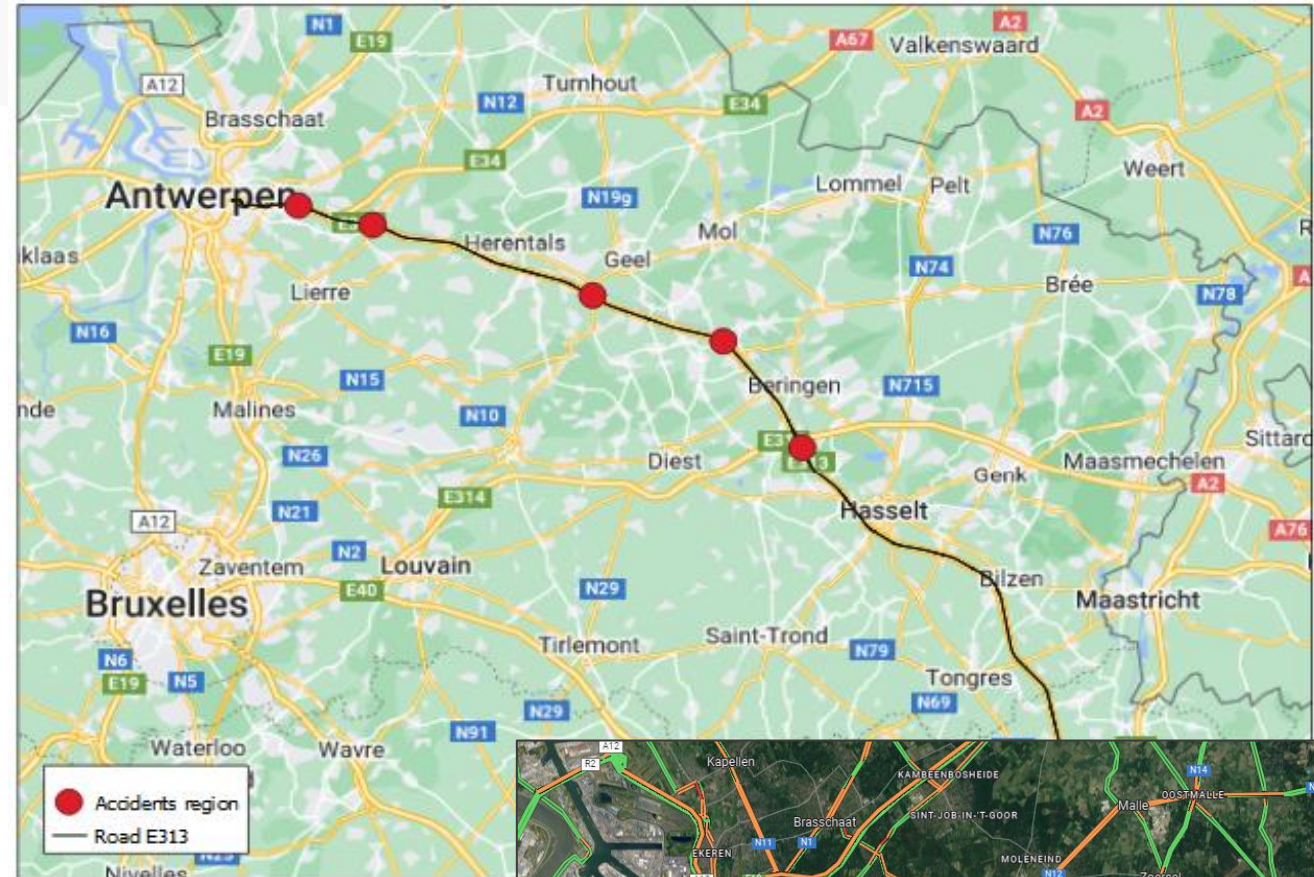
FRⵔNTIER
FUTURE MOBILITY

Accidents/congestion points

Accidents points:

1) Antwerp-West ↔ Wommelgem
2) Tessenderlo ↔ Ham
3) Massenhoven complex
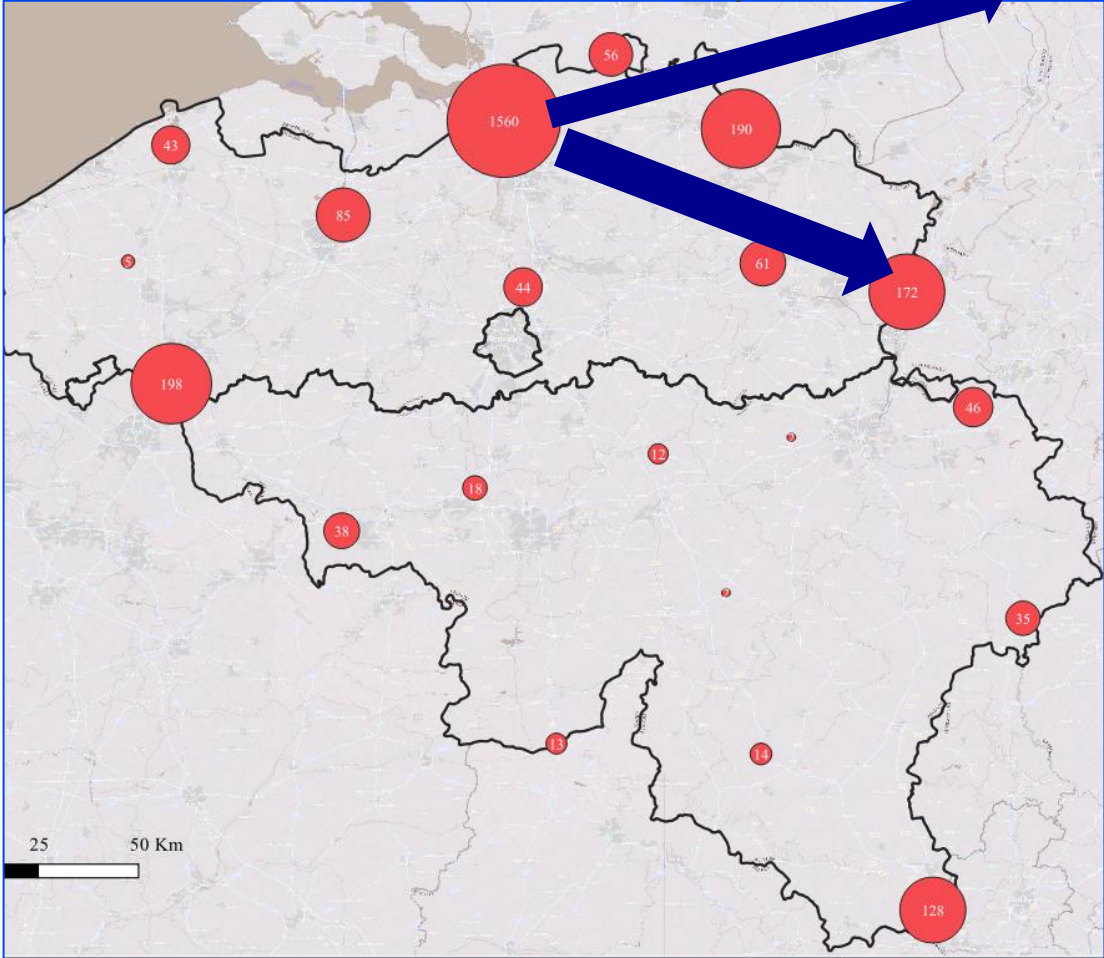4) Geel-West complex
5) Lummen node

Congestion points:

- The merging of the E34 and the E313 (Ranst junction)
- The Wommelgem slip road
- The connection of the E313 with the Antwerp inner ring road (Antwerp-Oost junction)
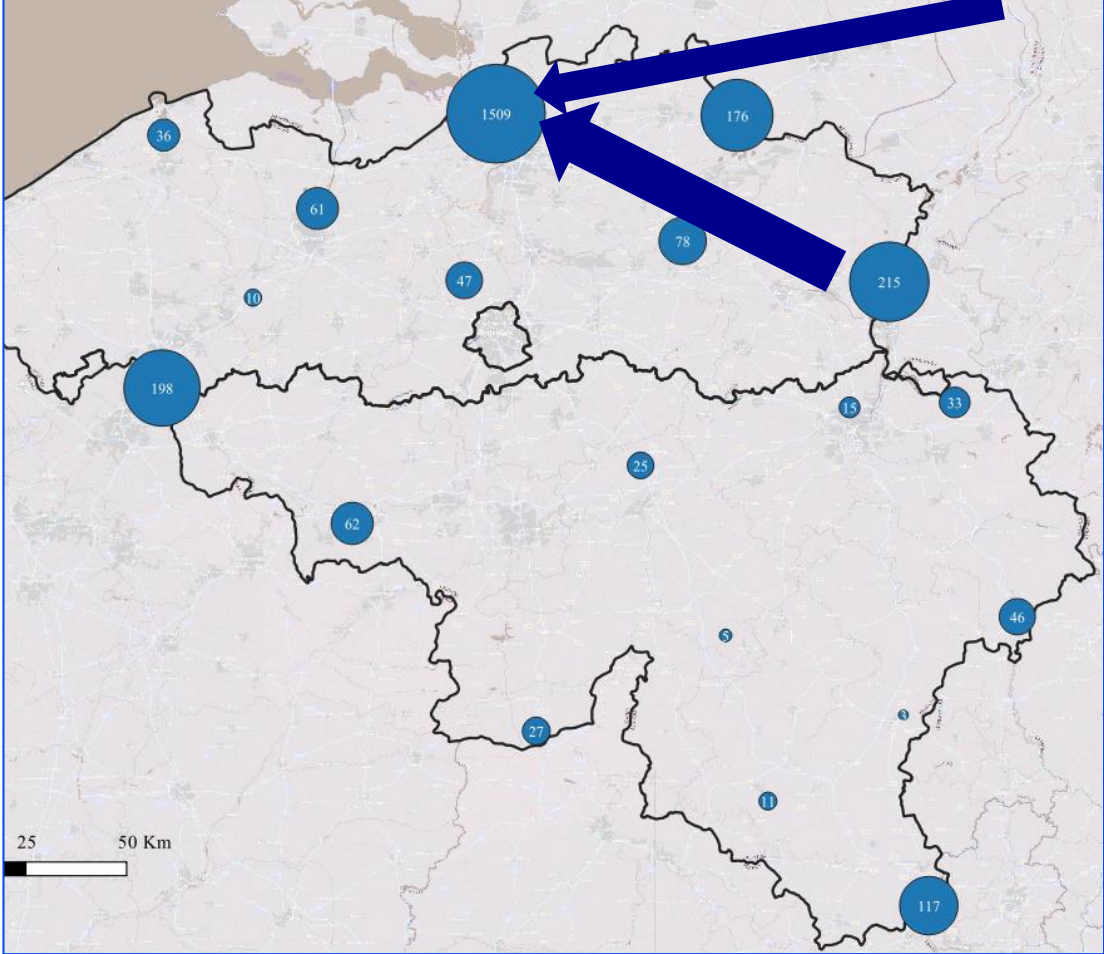
Truck flows in Flanders per week (Nov/2021: ViaPass data)

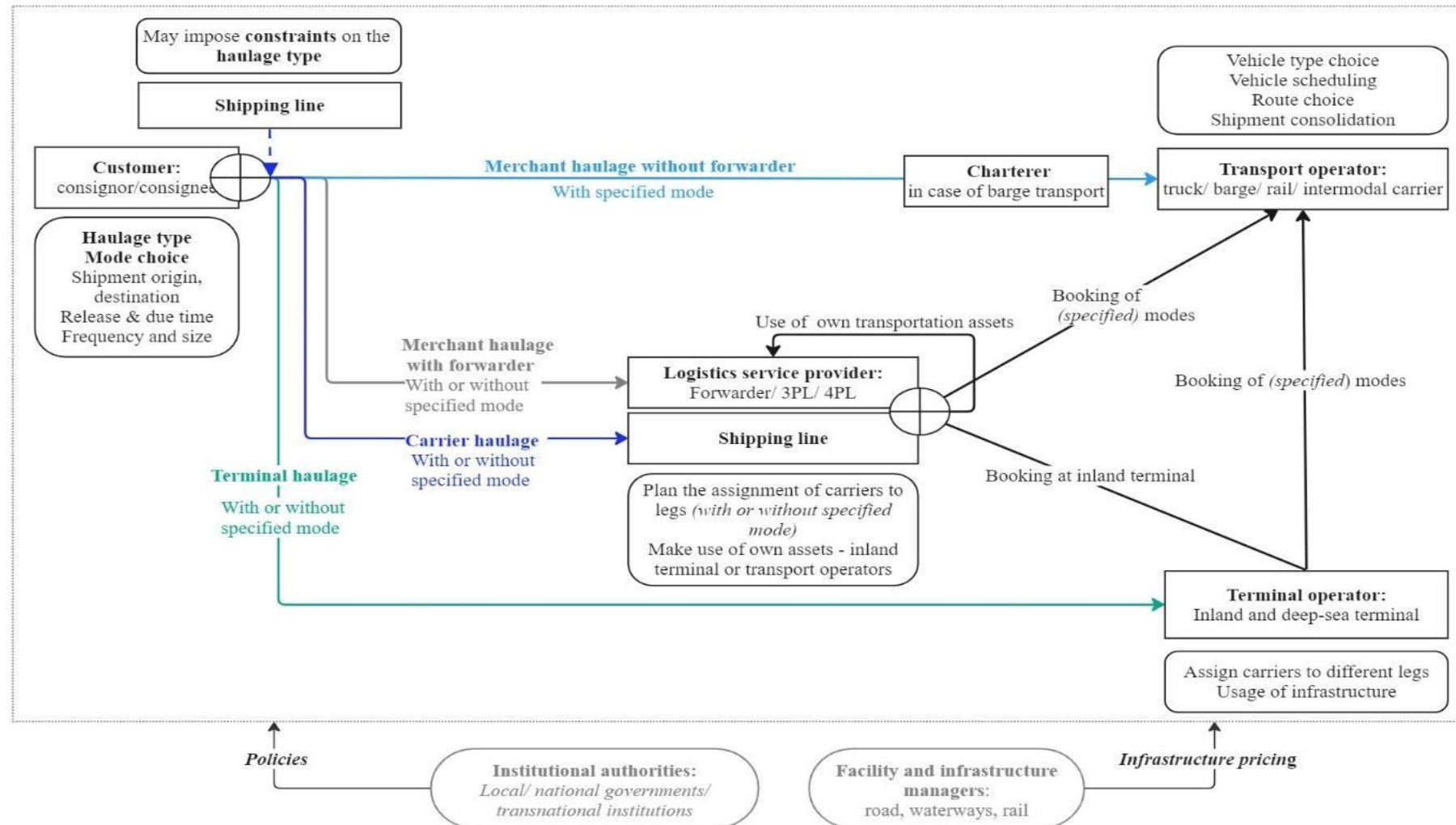Trucks destinations with origin at container terminals in Antwerp

Trucks Origins with destination at container terminals in Antwerp
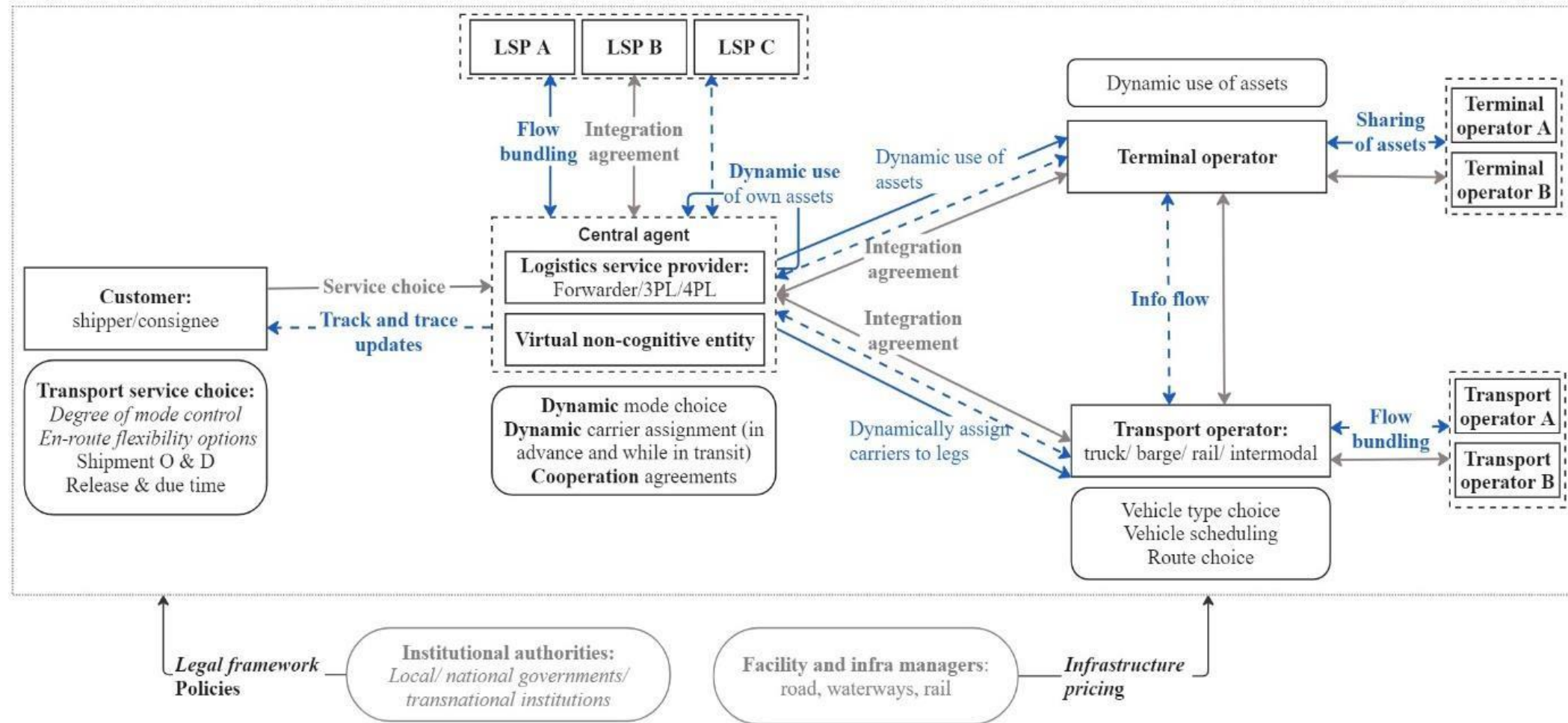
ANTME in Antwerp

Eco-system (base)

Ceulemans et al (2023)
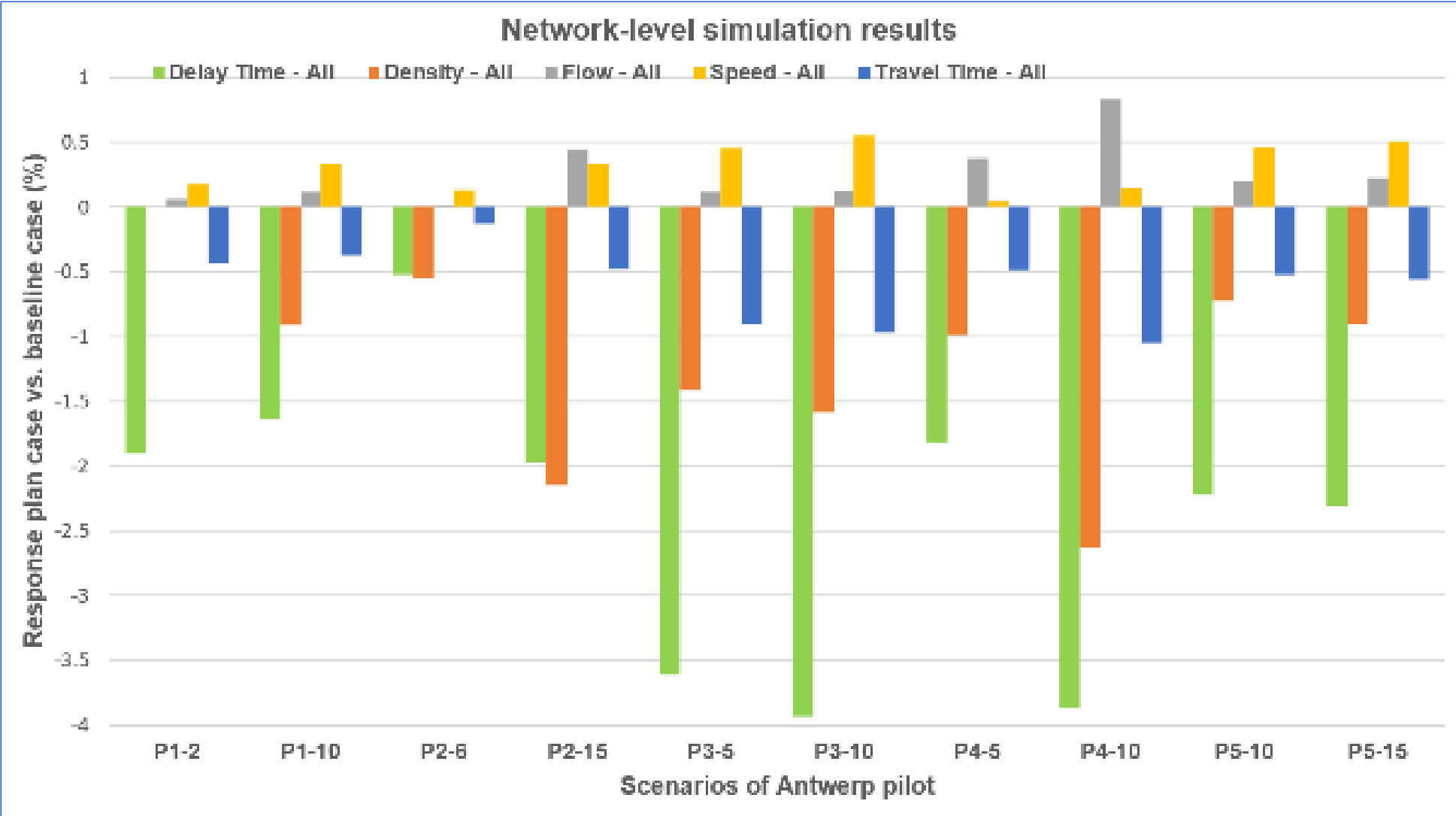
Ecosystem (new with synchro appraoch)

Ceulemans et al (2023)

First round of pilot results (1)

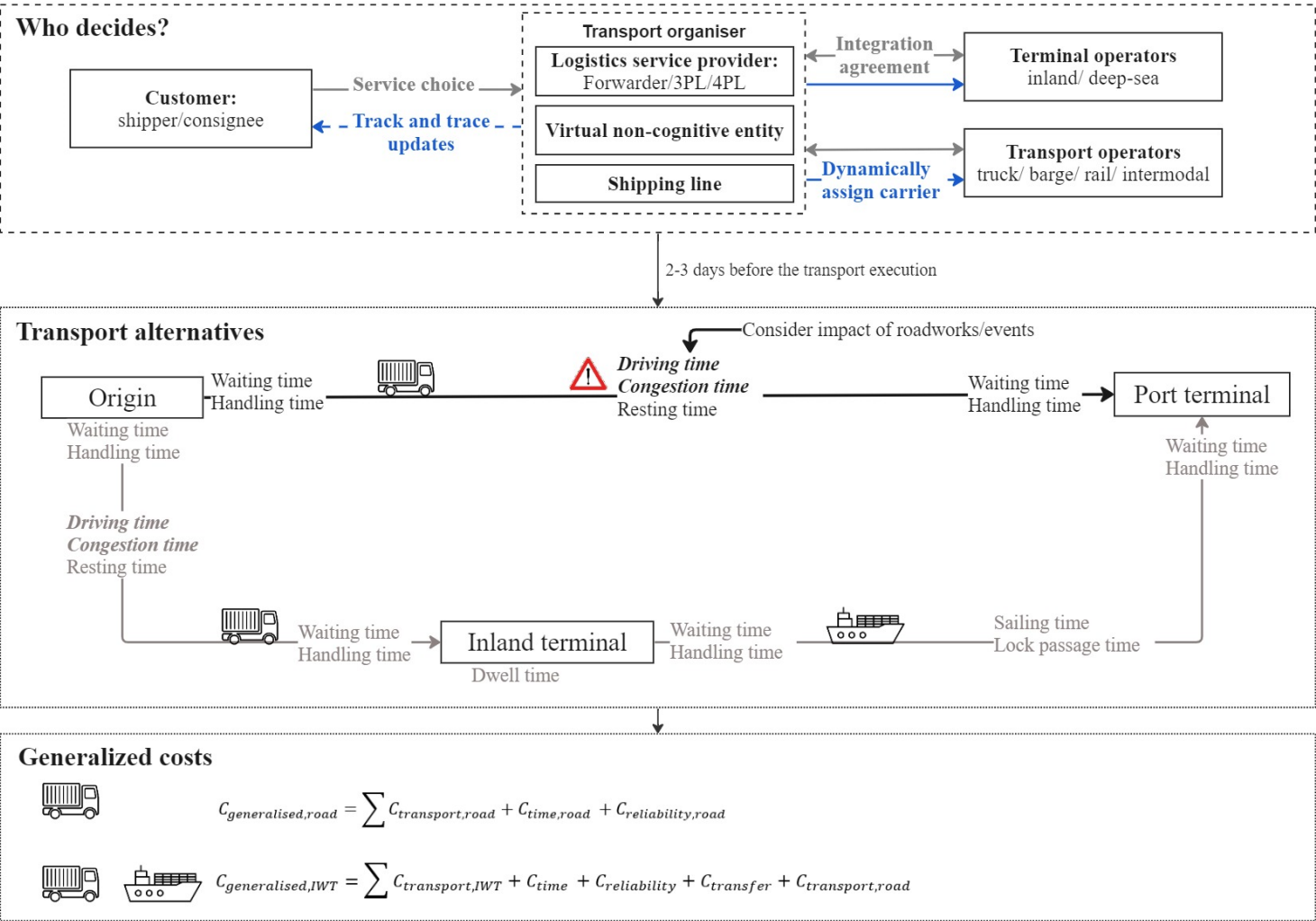| Scenario	# Closed lanes (traffic incident)	Duration of lane closure (hours)	Δ Shift to waterway (%)	# Closed lanes (traffic incident)	Δ Shift to waterway (%)	Duration of response plan/action application (hours)
	Baseline case			Response plan case		
P1-2	2/4	1	W1=8 W2=9 E1=13	2/4	W1=10 W2=11 E1=15	1
P1-10	2/4	2	W1=8 W2=9 E1=13	2/4	W1=18 W2=19 E1=23	2
P2-6	1/3	1	E1=32 E2=7	1/3	E1=38 E2=13	1
P2-15	1/3	2	E1=32 E2=7	1/3	E1=47 E2=22	2
P3-5	1/3	1	W1=21 W2=16	1/3	W1=26 W2=21	1
P3-10	1/3	1	W1=21 W2=16	1/3	W1=31 W2=26	1
P4-5	1/3	2	W1=14 W2=23	1/3	W1=19 W2=28	2
P4-10	1/3	2	W1=14 W2=23	1/3	W1=24 W2=33	2
P5-10	1/3	2	E1=51 E2=7	1/3	E1=61 E2=17	2
P5-15	1/3	2	E1=51 E2=7	1/3	E1=66 E2=22	2

Network-level simulation results

Freight demand model

How can the total transport cost be minimized by considering other modes of transport?
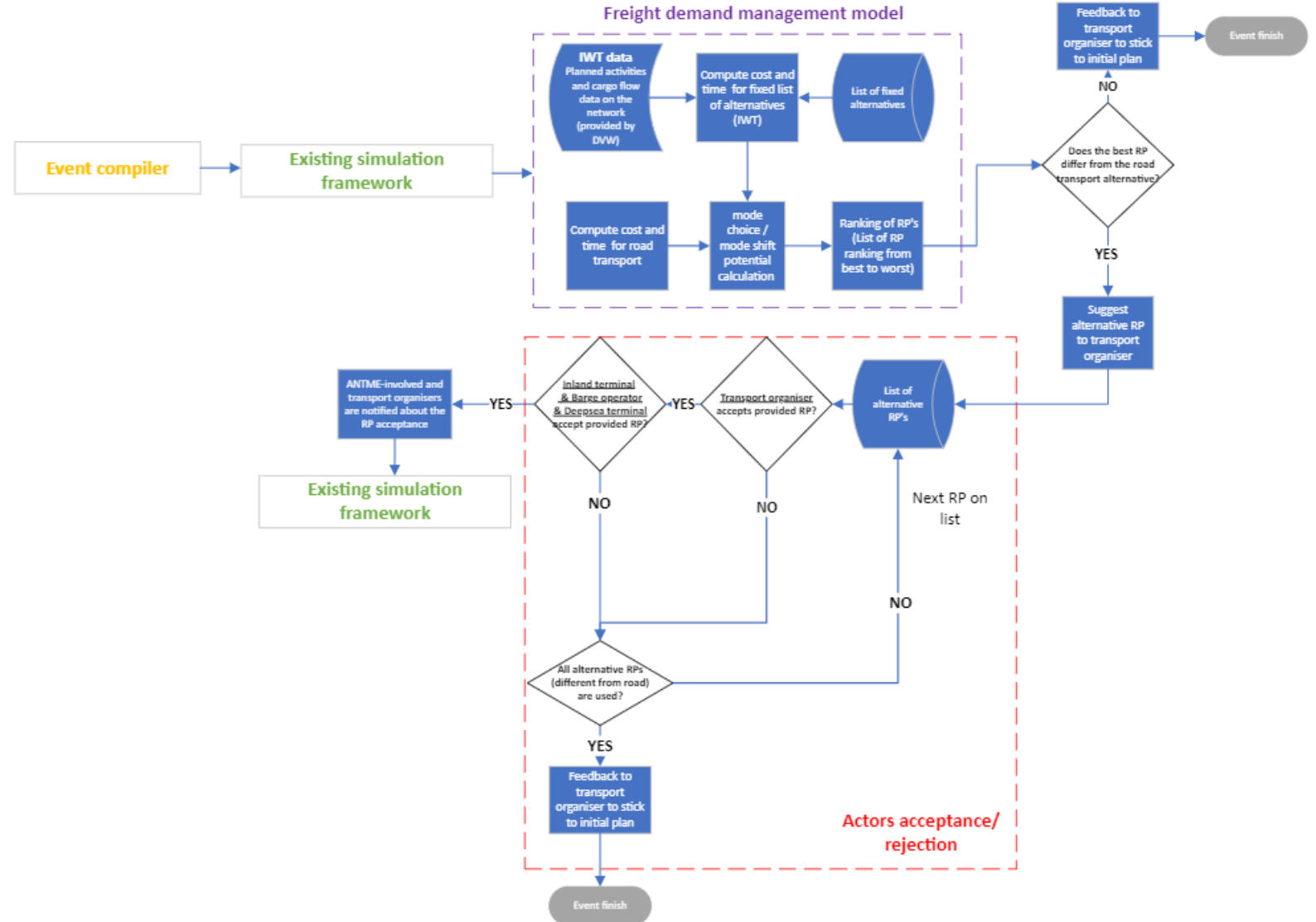
Calculating (based on expected state of the network) the cost for different alternatives and ranking them from best to worst alternative.

Generalised cost calculation framework

Who decides?

Customer: shipper/consignee — Service choice → Transport organiser

Transport organiser:
- Logistics service provider: Forwarder/3PL/4PL
- Virtual non-cognitive entity
- Shipping line

Track and trace updates

Integration agreement ↔ Terminal operators inland/ deep-sea

Dynamically assign carrier ↔ Transport operators truck/ barge/ rail/ intermodal

2-3 days before the transport execution

Transport alternatives

Consider impact of roadworks/events

Origin — Waiting time, Handling time → *Driving time, Congestion time, Resting time* → Waiting time, Handling time → Port terminal

Waiting time, Handling time

Driving time, Congestion time, Resting time

Inland terminal — Waiting time, Handling time — Dwell time

Waiting time, Handling time

Sailing time, Lock passage time

Waiting time, Handling time

Generalized costs

$$C_{generalised,road} = \sum C_{transport,road} + C_{time,road} + C_{reliability,road}$$

$$C_{generalised,IWT} = \sum C_{transport,IWT} + C_{time} + C_{reliability} + C_{transfer} + C_{transport,road}$$

Proposed workflow

Transport organiser:
- Shipment of 1 FEU container from Limburg-West to DP World
- Date of reconsideration transport alternatives & release: 28/11
- Due date: 3/12

Arbitration

2.

❌

Time constraint

1.

3.

4.

RP Generator & freight demand management model

Response plan 1: direct road transport (base case)
- Scheduled departure for 1/12, arrival on 1/12
- Estimated transit time: 2.5 hours
- Generalized transport cost: 300 EUR

Response plan 2: Intermodal inland waterway transport via BCTN Beringen
- Scheduled departure for 29/11, arrival on 30/11
- Estimated transit time: 7 hours
- Generalized transport cost: 290 EUR

Response plan 3: Intermodal inland waterway transport via BCTN Meerhout
- Scheduled departure for 1/12, arrival on 1/12
- Estimated transit time: 6.5 hours
- Generalized transport cost: 290 EUR

Response plan 4: Intermodal inland waterway transport via BCTN Geel
- Scheduled departure for 1/12, arrival on 1/12
- Estimated transit time: 6 hours
- Generalized transport cost: 310 EUR

Response plan 5: Intermodal inland waterway transport via GCT Deurne
- Scheduled departure for 1/12, arrival on 1/12
- Estimated transit time: 3 hours
- Generalized transport cost: 350 EUR

Acceptance /rejection

Response plan 3
Intermodal inland waterway transport via BCTN Meerhout

Transport organiser ✔ ❌

Terminal operator Transport operator ✔ ❌

If rejected: Response plan 1 (=2nd best RP) will be executed

Main take aways

- **The proposed system is under development and is nearing completion**

- **First results are expected early 2024**

- **All actors need to be involved in the approach and need to agree with a mode shift**

- **The system could be used to shift cargo from road transport to IWT (also if initially cargo is assignment to road transport)**

- **Also, a case will be developed to attract road cargo with an origin in Germany and a destination in Antwerp**

FRONTIER
FUTURE MOBILITY

Thank you for your attention.

FRONTIER
FUTURE MOBILITY

Brenner Motorway: overview of the activities implemented in MERIDIAN

Activities implemented in Meridian

1. Creation of a MaaS integration layer including traffic data

2. Extension of the infrastructure needed to implement traffic control measures to reduce emissions

The Brenner Motorway

314 KM

1 TRAFFIC CONTROL CENTRE

23 TOLL GATES + **1** TOLL BARRIER

6 MAINTENANCE CENTRES

6 SERVICE CENTRES

22 SERVICE AREAS + **1** TRUCK PARK

147 OVERPASSES

30 MONODIRECTIONAL TUNNELS (12.6 km)

144 BRIDGES AND VIADUCTS (31.2 km)

427 LAY-BYS

84.1 KM OF NOISE BARRIERS
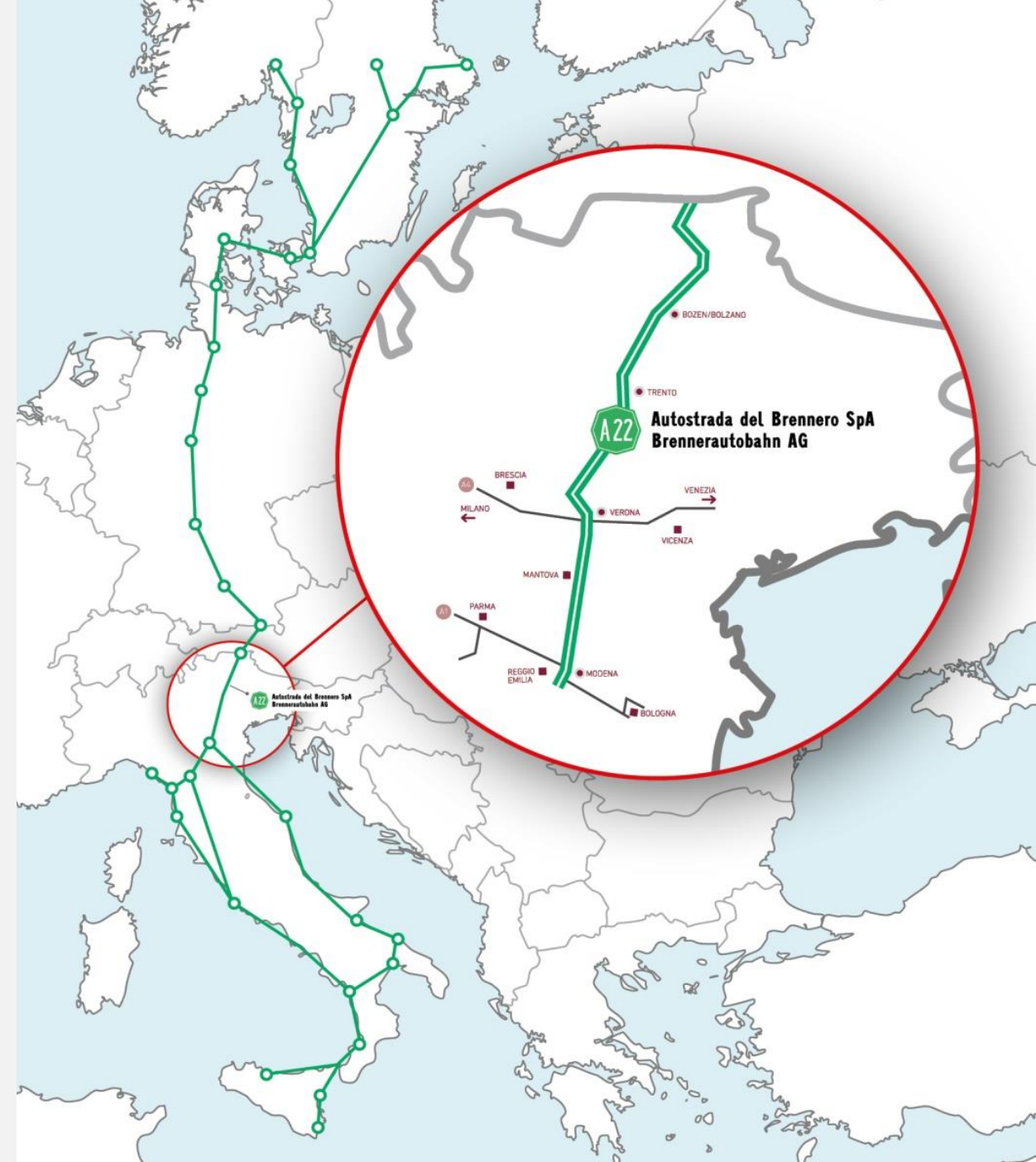
Creation of a Digital Infrastructure based on the MaaS concept

- Implementation of a real-time multimodal/intermodal management dashboard and trip planning engine

- Use available traffic data along the corridor, exposing route calculation functions to third parties

Aim of the project

The project aims at creating a digital infrastructure that:

- Collects mobility data from motorway concessionaires and the various transport services operating in the surrounding areas;

- Enables a layer for third-party services and provides both open data and open services on mobility.
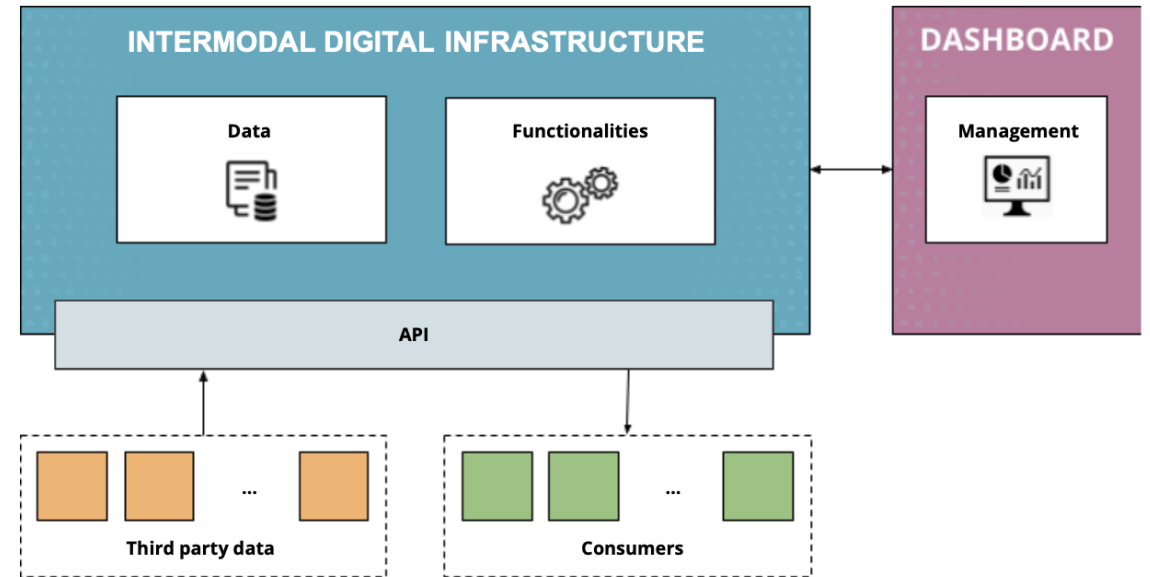
The unique project aims at the construction of a digital European motorway corridor, bringing together infrastructures and services from different geographical, national and cross-border areas.

Co-financed by the Connecting Europe
Facility of the European Union

Roadmap

- Analysis of the logical system architecture of the digital infrastructure to support integrated corridor traffic management with the Mobility as a Service concept

  Q4 2021 (commissioning) → Q4 2022 (end of analysis)

- Design, development, test and deployment of the component in charge with the collection and management of data and of the module to calculate multimodal paths of the digital infrastructure (PHASE 1)

  Q3 2023 (commissioning) → Q1 2024 (estimated end)

- Design, development, testing and implementation of the dashboard (OpenMove ATLAS) enabling the management of the digital layer. The management dashboard will collect data, assess data quality, and expose open data and open services via APIs (PHASE 2)

  Q2 2024 (estimated commissioning) → Q1 2025 (estimated end)

Phase 1

- <u>OpenMove ROAD & TRAFFIC MANAGER</u>

  Made up of:

  - <u>Input Manager</u>: a component **collecting data** from third-party providers, where all communications from and to third parties are initiated: all information needed are made available thanks to an API integration layer.

  - <u>Data Driver</u>: a component that **manages the data collected**, processes it and makes it available to the mobility modules via a non-relational database.

  - a module with functionality for the **calculation of the intermodal route**, which includes both road mobility and other mobility offerings of the surrounding area (Trentino)

  - <u>Mobility modules</u>: **process** the heterogeneous **data** received by the Input Manager and managed by the Data Driver, **standardizing them** in structure, using standard formats, and making them available with endpoints that can be queried via the API layer.

Phase 1

▪ OpenMove NUCLEUS

It's the central part of the development and implementation of the project made up of several modules:

- Profile/IDM: a module **managing the system's user data**, including **authorizations** managed according to the user's characteristics (administrator, supervisor, end-user, etc.). All system authorizations are managed by this module, which is queried by all other system components.

- Fare system: a module describing all possible **fare policies** to be managed by the system, such as the payment of a fee or charge for access to certain types of data.

- Analytics: a module for **generating and exporting reports** for analyzing the data generated by the system.

- PBC: a module **managing payment service providers** offered by the system: it also allows billing and clearing in case a users uses a combination of data belonging to different providers

Phase 1

- OpenMove NUCLEUS

- **Trip planner**: a dedicated module for **multimodal route calculation**, step-by-step instructions and navigation.

    - The main component of the trip planner engine deals with route search by combining routes and information (e.g. on traffic, parking availability, availability of electric charging stations in a certain area, etc.) through networks built by combining different data and their representation on a map.

    - Several routers are used to enable optimized route calculation for the system (e.g. Open Trip Planner and Open Source Routing Machine).

    - The intermodal route calculation engine performs the best route calculation using collected d transport data in GTFS or NeTEx format in combination with maps (e.g. OpenStreetMap) satellite elevation data (DEM, Digital Elevation Model), i.e. static data.

Phase 1

- OpenMove NUCLEUS

  - **API integration layers** allow third parties to use all data collected and elaborated within the data manager of the Meridian project.

    - With these data public and private parties can <u>develop solutions</u> for end users elaborating and showing mobility data. APIs are also made available for the proper functioning of administrative dashboards for <u>monitoring</u> and <u>governance</u> of the entire system.

    - The endpoints also allow interaction with the components and data of the system and allow the system configuration to be managed.

TOLL GATES:
FUTURE INTERMODAL HUBS

With a single search, the user will access a single mobility service that will consider all forms of transport **and** a single mode of payment

Autostrada del Brennero is the first European motorway operator to develop a Mobility-as-a-Service concept to create **a digital European corridor combining infrastructure and services**

Integration of low-cost sensors for air quality measurement, traffic detection systems and variable message signs to extend BrennerLEC traffic measures to reduce emissions

The BrennerLEC project
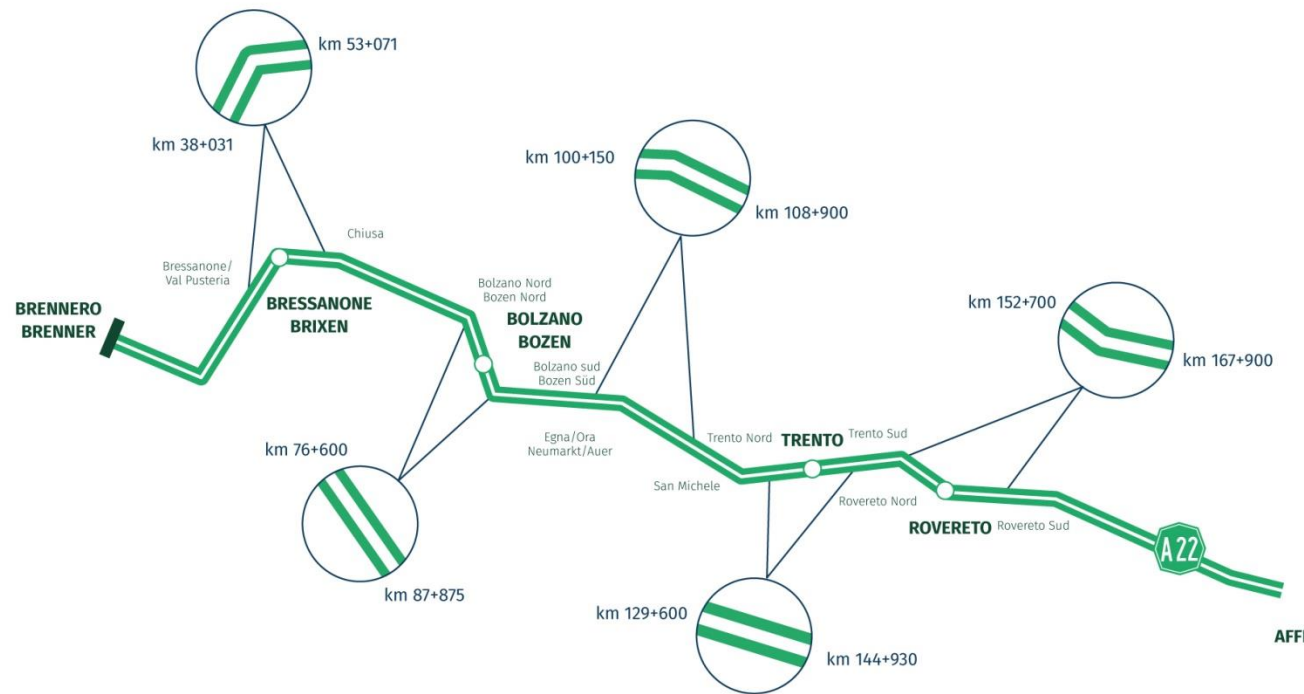
PROJECT TEST AREAS ALONG THE A22
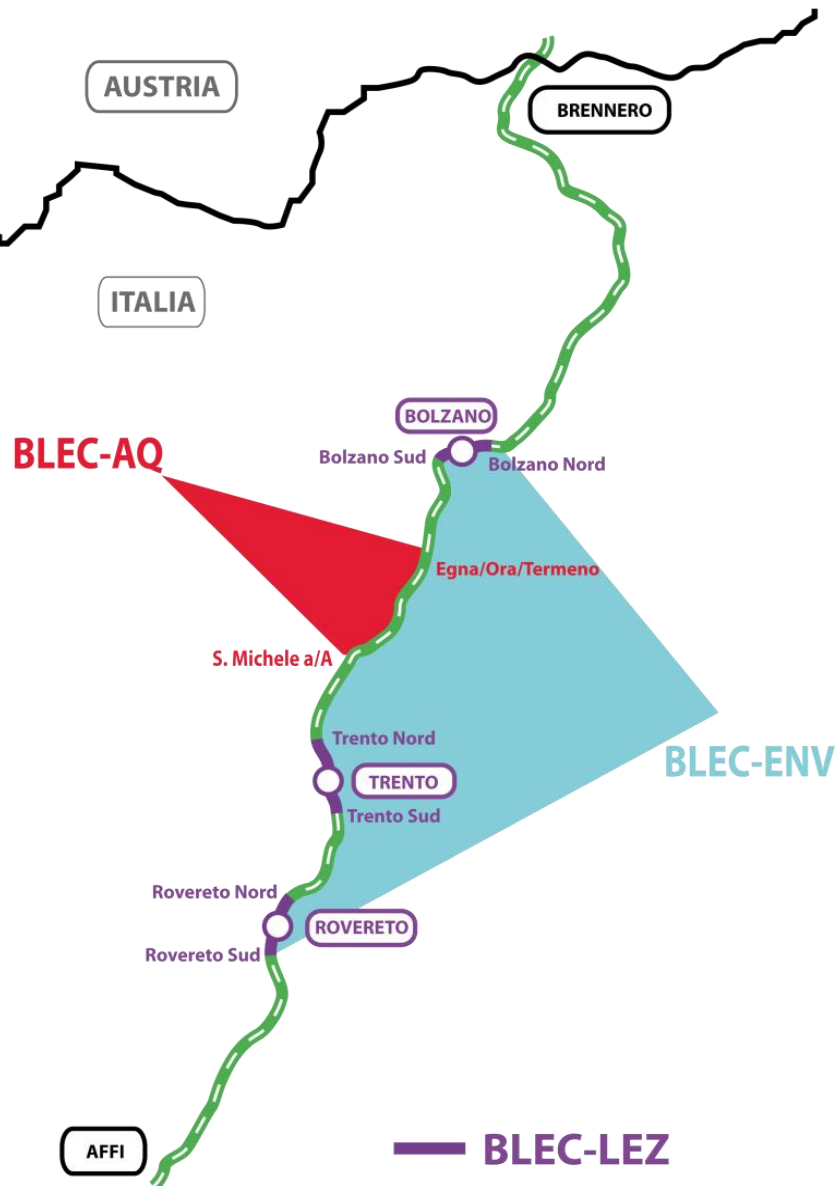
BLEC-ENV — SPEED LIMITS REDUCTION TO INCREASE CAPACITY

BLEC-AQ — SPEED LIMITS REDUCTION TO REDUCE EMISSIONS

BLEC-LEZ — JOINT MANAGEMENT OF TRAFFIC BETWEEN URBAN ENVIRONMENT AND HIGHWAY
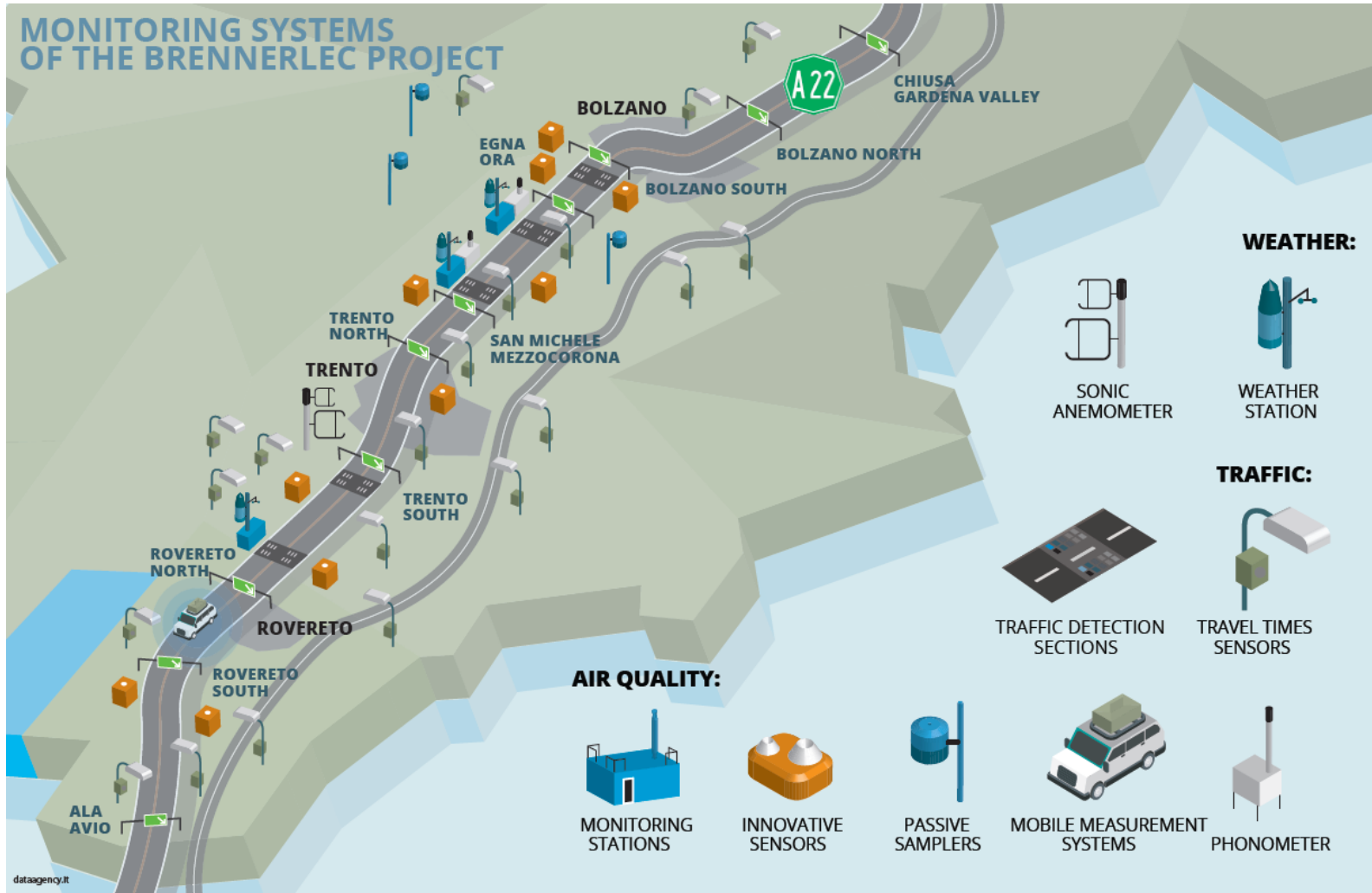
Co-financed by the Connecting Europe Facility of the European Union

The BrennerLEC project – data collection and management system

The BrennerLEC project – project results
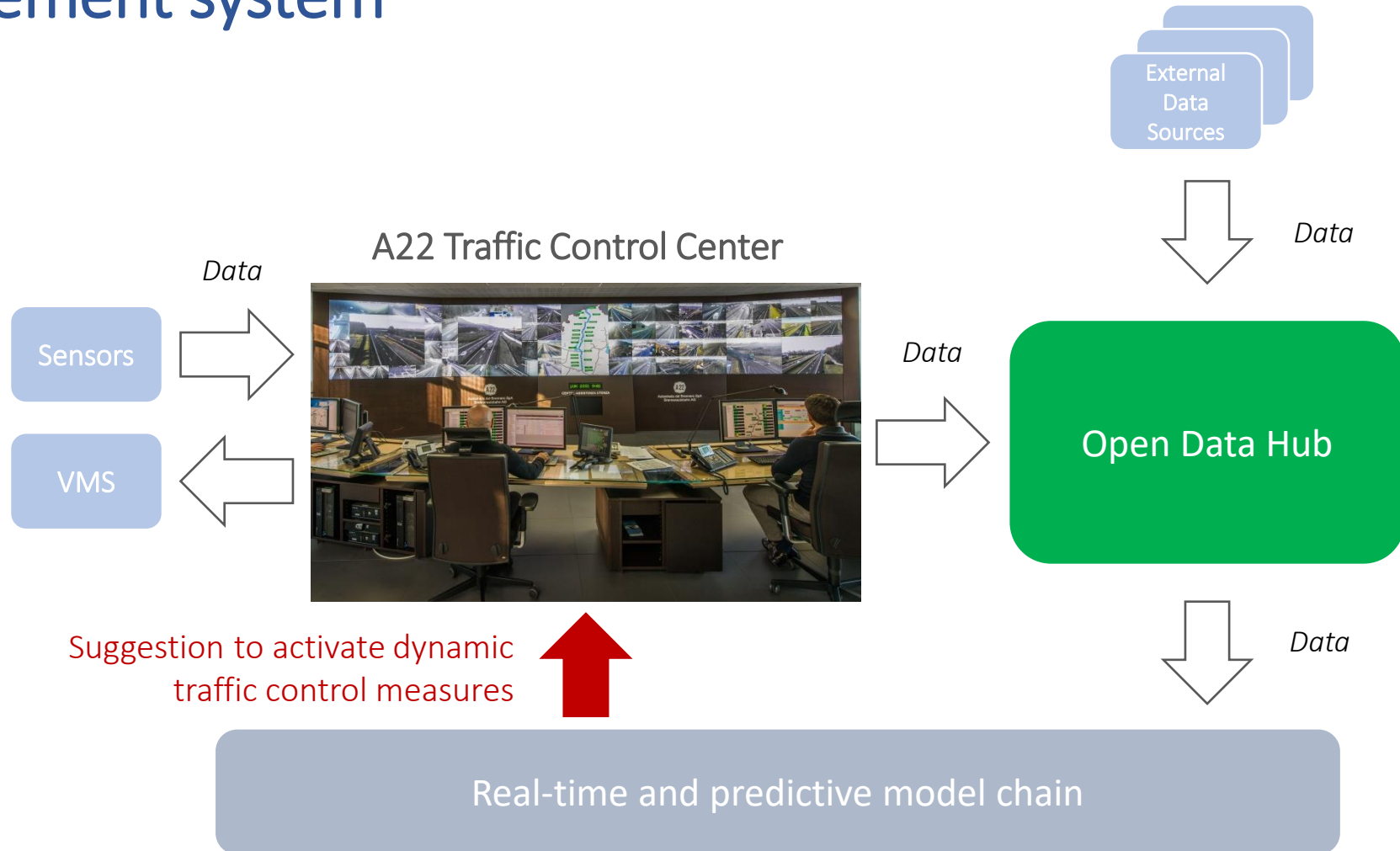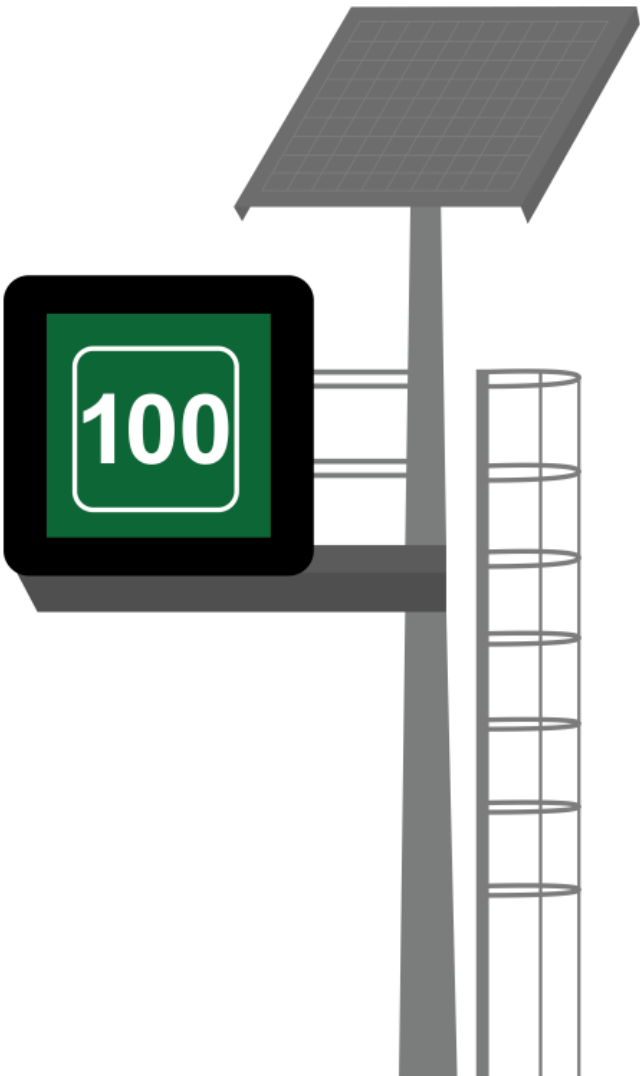
WITH SMOOTH TRAFFIC FLOWS

- Reduction of roughly 10% of NO_2 concentrations with an average speed reduction of 15 km/h

## UNDER HEAVY TRAFFIC CONDITIONS

- Travel times reduction of approximately 10% even with a 10% increase in traffic volumes

- Reduction in the duration of disruptions by 2 hours per day

- Significant improvement of safety conditions - Accident rate close to zero with dynamic speed limits

The BrennerLEC after-LIFE project

In view of the excellent results achieved in more than 5,000 hours of testing, it was decided to replicate these measurements on other highway sections
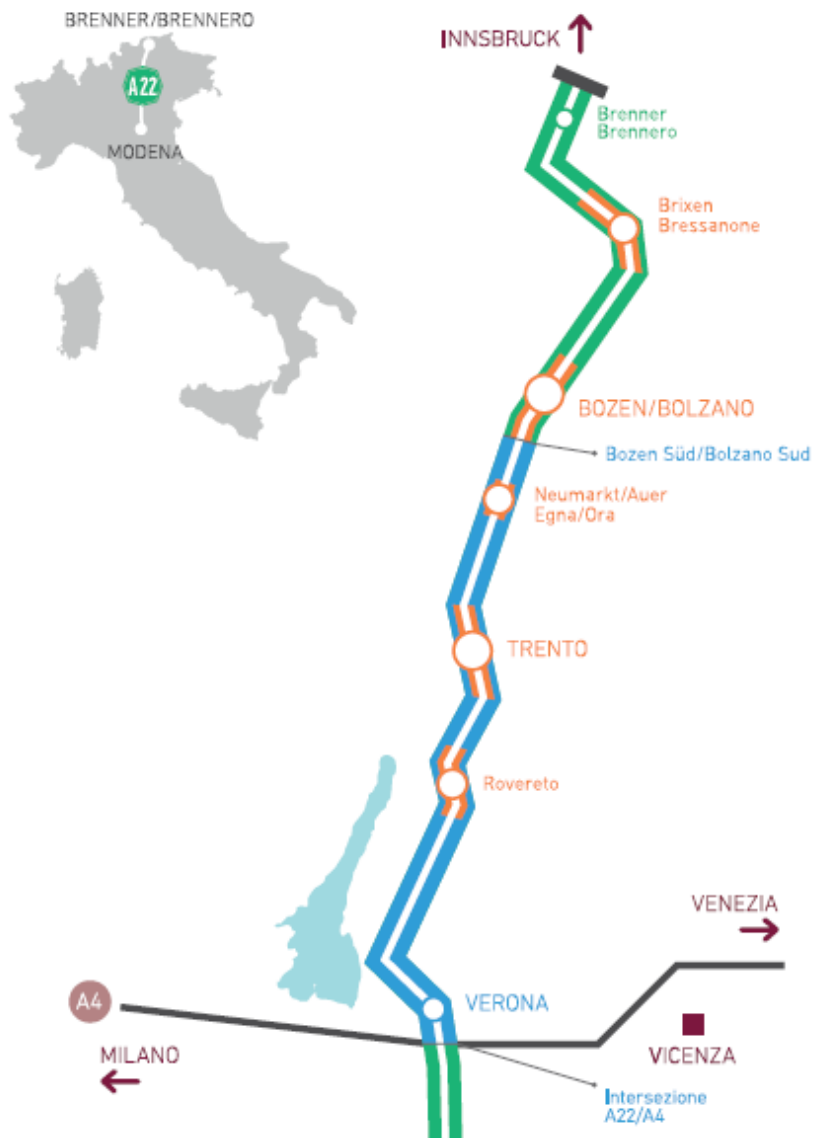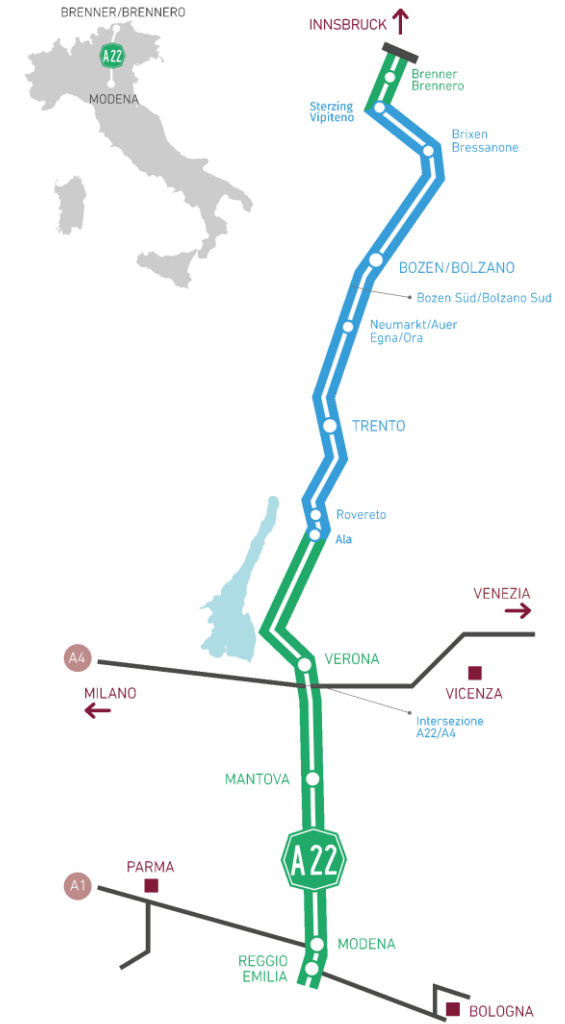
Replication of Management Measures after the LIFE Programme
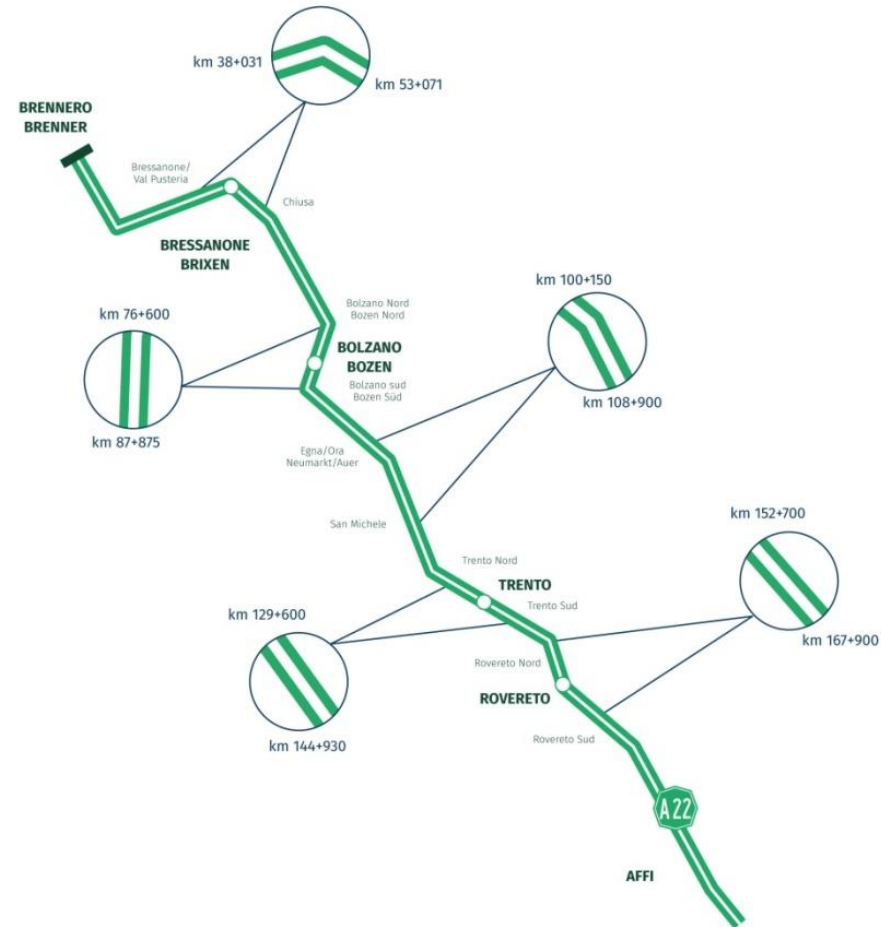
Dynamic speed limits to improve air quality

Dynamic speed limits to increase capacity and safety

Extension of the infrastructure to reduce emissions

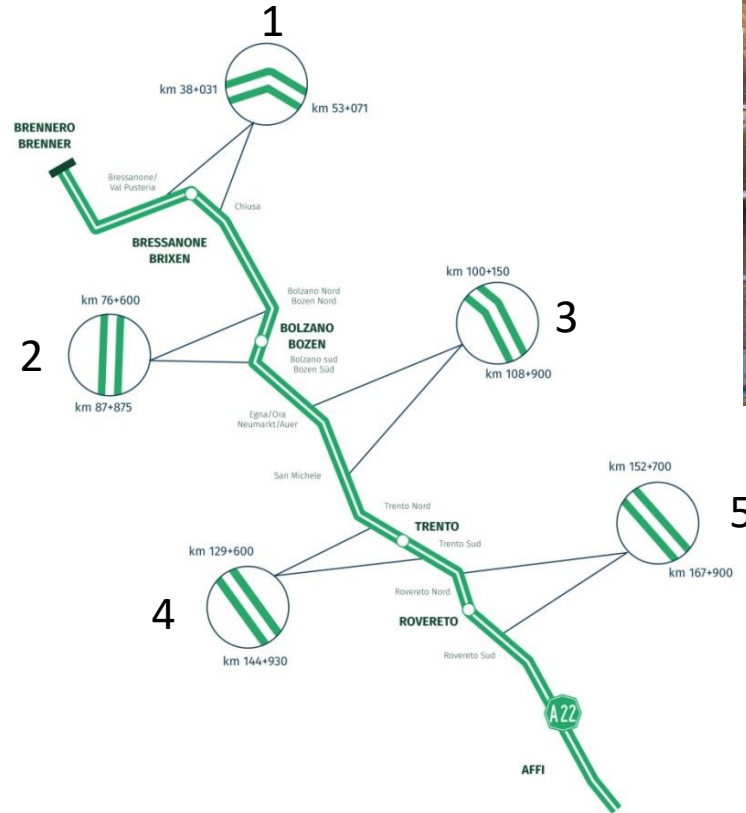- Purchase and installation of 10 new low-cost air quality measurement sensors + revamping of 10 BrennerLEC sensors

Area **1** - 2 sensors

Area **2** - 3 sensors

Area **3** - 4 sensors

Area **4** - 3 sensors

Area **5** - 3 sensors

The remaining 8 sensors are going to be installed in the motorway stretches between the measurements area, to compare parameters in contiguous areas were no speed reduction is implemented

Extension of the infrastructure to reduce emissions

- Installation of new cameras needed to classify vehicles and monitor travel times

Extension of the infrastructure to reduce emissions

■ Installation of new variable message signs and integration of new panels on existing gantries

ACTIVITY TO BE COMPLETED BY Q1 2024

Brenner Motorway: overview of the activities implemented in MERIDIAN

MERIDIAN

A22 Autostrada del Brennero SpA
Brennerautobahn AG

MERIDIAN

Interporto Toscano – "A multimodal infrastructure for the port of Livorno"

Guasticce 13 December 2023

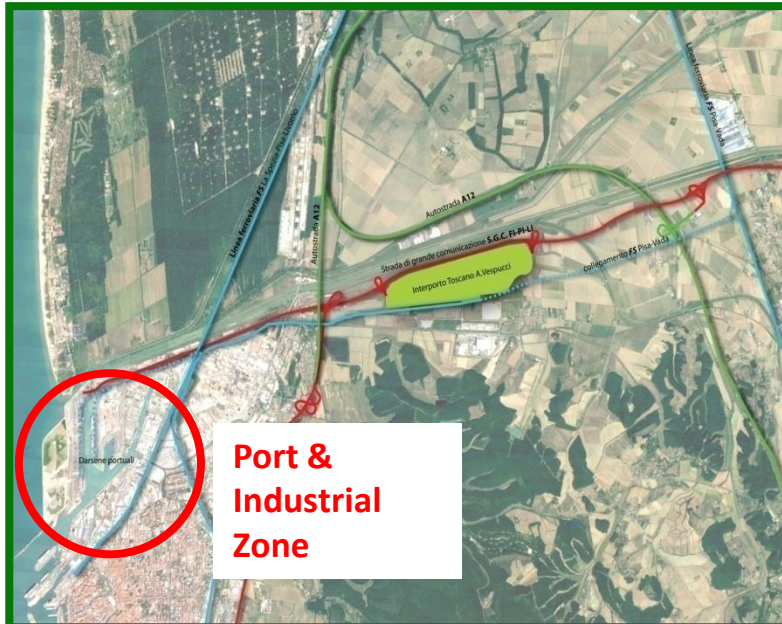Raffaello CIONI
Managing Director
Interporto Toscano Amerigo Vespucci SpA

Interporto Toscano Amerigo Vespucci
Today

Locations and Connections
Multimodal Vocation

All 4 modalities are available and combinable

AMERIGO VESPUCCI INTERPORTO TOSCANO S.P.A.

Port & Industrial Zone

Pisa Airport

DISTANCES

Porto di Livorno	5 km
Aeroporto di Pisa	12 km
Firenze	80 km
Pisa	20 km
Viareggio	40 km

Interporto Vespucci Today

Total Area 2.800.000 Sqm

Wharehouses: 324.500 Sqm – 430.000 ca after completion

Yards: 696.000 Sqm

Yards with Services: 470.000 Sqm

Rail Terminal: 126.000 Sqm

General Services Area: 142.000 Sqm

Internal Roads: 12 km

Green Areas: 285.000 Sqm

Direct Occupation: 600 people (ca) – 900 plus with new buildings

Areas for future development 120.000 m2

Rail Terminal Expantion   150.000 SQM

Localizzazione e collegamenti
VOCAZIONE MULTIMODALE

- 2 DIRECT DEDICATED ACCESS on Leghorn-Florence Motorway
- 2 GATEs IN-OUT with OCR recognition system (GATE EST E OVEST)
- TRUCK VILLAGE & TRAILER SERVICE dedicated to Parking, Port Pre Gate - MOS
- RAIL TERMINAL: 4 Rail Tracks and 126.000 Sqm of Yard Area
- COLD VILLAGE: Fresh and Frozen Warehouses
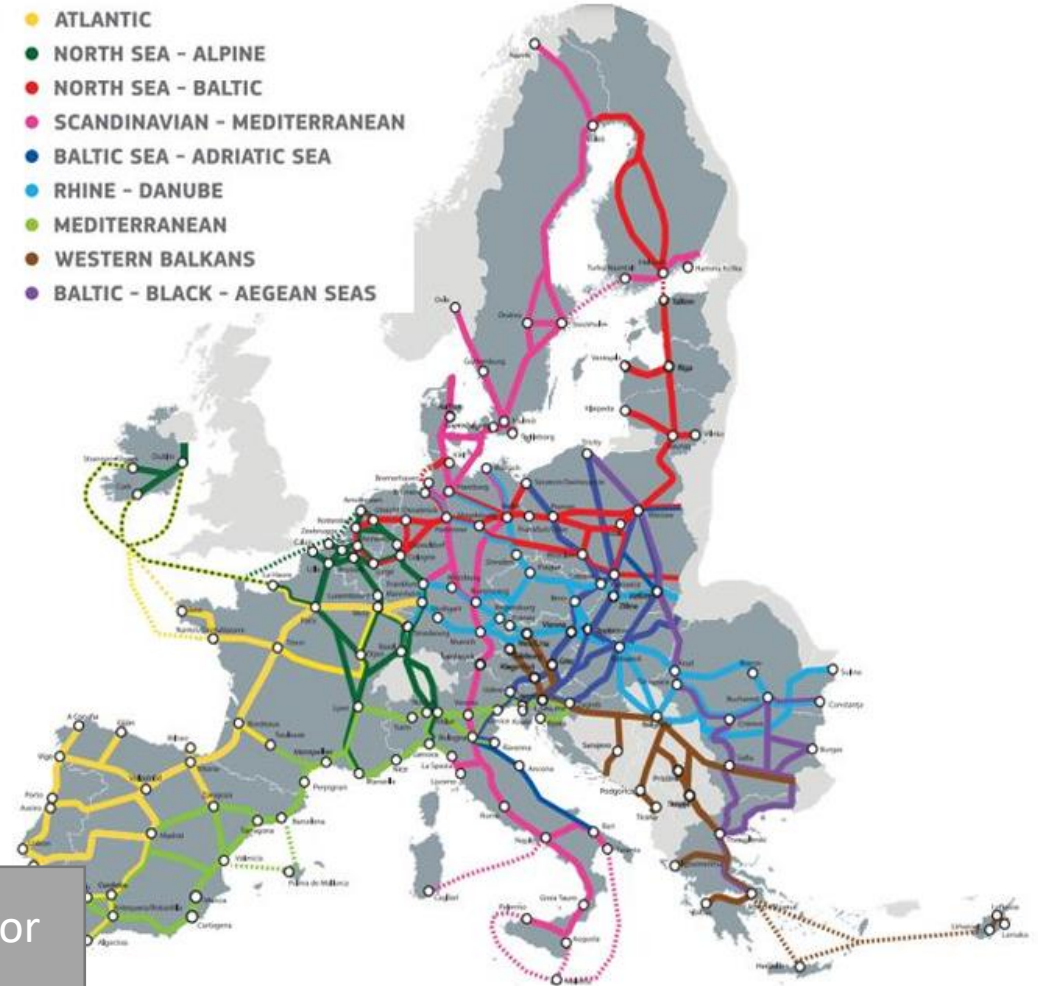- Pharma Valley Platform (Under Development)
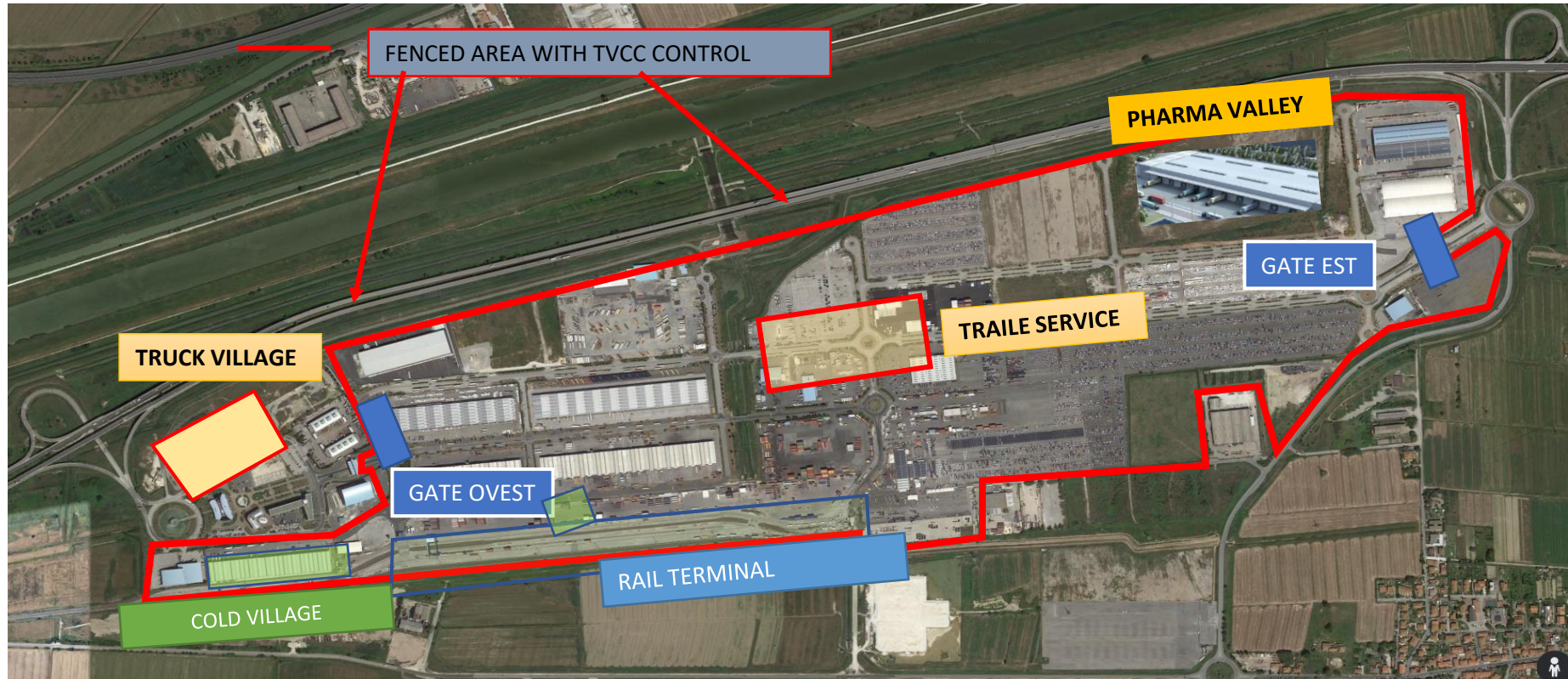
Locations and Connections
Interporto Vespucci - CORE TEN-T Logistic Platform

ITAV is a CORE infrastructure of SCANDINAVIAN-MEDITERRANEAN corridor

ITAV is also one of the INTERPORTS OF NATIONAL INTEREST

ITAV has been identified as Simplified Logistics Zone (ZLS).

https://transport.ec.europa.eu/system/files/2023-03/Creating_a_green_and_efficient_Trans-_Transport_Network.pdf

Main Business Located in Interporto

Aereospazio
🏷 Research and development on electric space propulsion

Agecontrol
🏷 Controlli sulle Merci

Autamarocchi
🏷 Trasporti, Trasporto Container

Gruppo Gavio G&A
🏷 Trasporto prodotti chimici, Trasporto prodotti petroliferi

B Cube
🏷 Logistica Industriale

Mercurio
🏷 Trasporti

Officine opus – Omaelba
🏷 Officina Mezzi, Officine Ferroviarie

Ram Energy & c
🏷 Costruzione impianti industriali, Ingegneria

Relais Leasco
🏷 Real Estate

Servizio Fitosanitario Toscano
🏷 Servizi Fitosanitari

Bar Ristorante "I Contadini"
🏷 Bar, Ristorante, Tavola Calda

Bieffe / Hillebrand
🏷 Logistica, Trasporto

Bitossi Logistica e Servizi
🏷 Prodotti Vari

Boccia Autotrasporti
🏷 Trasporti

C.R. di Cinquini C.
🏷 Riaparazione e manutenzione container

Società Italiana Dragaggi SpA
🏷 Dragaggi

Sogese
🏷 Vendita e noleggio Container

Spreafico
🏷 Distributore Frutta

T.Log & Co
🏷 Logistica, Trasporti

Terminal Italia – Inter Repair
🏷 Terminal Ferroviario

C.S.C. Vespucci
🏷 Cold storage

Casarosa Fratelli & C. SNC
🏷 Merci Varie

Centro car
🏷 Carrozziere

Ceva Logistics
🏷 Logistica Industriale

Coremas Polaris
🏷 Deposito e riparazione container, Progettazione Shelter

Trailer Service
🏷 Deposito, Parcheggio camion

Trans Shipping
🏷 Export Legnami, Import Legnami, Spedizioni Legnami

Transporti Ordinari Portuali
🏷 Trasporti Portuali

Unifrutti Distribuition Spa
🏷 Distributore Frutta

Washmed srl
🏷 Camion e Tank, Lavaggi Cisterne

Darsena Europa Scarl
🏷 Realizzazione Darsena Europa

Express Agency Ups
🏷 Logistica

Field Core
🏷 Industrial Field Services

Francesco Francesconi SAS
🏷 Agente Marittimo, Spedizioniere

Geom. Puccini – Ing Notarangelo
🏷 Geometra, Ingegnere

Giorgio Gragnani S.r.l
🏷 Agente Marittimo, Intermediazione doganale, Logistica

Global Services
🏷 Manutenzione Ordinaria e Straordinaria, Noleggio mezzi di sollevamento

Gori
🏷 Spedizioni Alcolici, Spedizioni Vino

ICT Plus
🏷 Infrastrutture, Reti IT

Inter Repairs Nora
🏷 Deposito e riparazione container

Jas Jet Air Service
🏷 Intermediazione doganale, Spedizioniere

Kortimed
🏷 Trasporto Liquidi Alimentari

Logistic Training Academy
🏷 Consulenza Logistica, Formazione Logistica

Martelli Autotrasporti
🏷 Logistica, Trasporti

Maurilli Autotrasporti
🏷 AutoTrasporti

Transport Companies

Shipping Forwarders

Logistic Services

Couriers

Restaurat Bar

Industrial sector

Repair Shop

Petrol Station

Trucking Companies

Intermodal Transport

Shipping Agency

Maintenance & Repair

Our Services For the Interporto Community

Green Energy Provider

Water Provider

ITAV SERVICE
Engineering & Maintenance

Interporto's Services
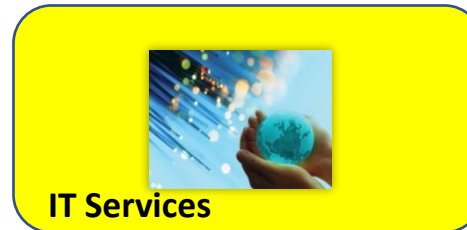
INTERPORTO BUS

IT Services

Fire Brigade Station

motel VESPUCCI

Scegli la comodità.
Scegli Motel Vespucci.

Prenota Ora

Conference Room

Interporto Toscano Amerigo Vespucci
Services for the Supply Chain

Transport modes integrations

PORT Overeseas – SSS- MoS

MOTORWAY NETWORK

AIRPORT

INTERPORTO

PHARMA VALLEY

GATE EST

TRAILE SERVICE

GATE OVEST

TRUCK VILLAGE

RAIL TERMINAL

LAST MILE DELIVERY

UIR NETWORK
TEN-T NETWORK

1	PORT CONNECTION	5	ROAD NETWORK ACCESS	9	LAST MAIL DELIVERY
2	SHUTTLE TO-FROM PORT	6	ROAD ACCESS TO TRUCK VILLAGE	10	TRAIN SHUTTLE TO/FROM PORT
3	SHUTTLE PORT – RAIL TERMINAL	7	PORT BUFFER PARKING	11	RAIL NETWORK ACCESS
4	ROAD NETWORK - TERMINAL FERROVIARIO	8	AIRPORT CONNECTION		

ITAV WITH ITS POSITION INTEGRATES THE TYPICAL CONNECTIONS OF A FREIGHT VILLAGE AND ALLOWS INTERACTIONS WITH THE PORT AND AIRPORT

TRUCK VILLAGE

AREA BUFFER a supporto Operazioni Portuali
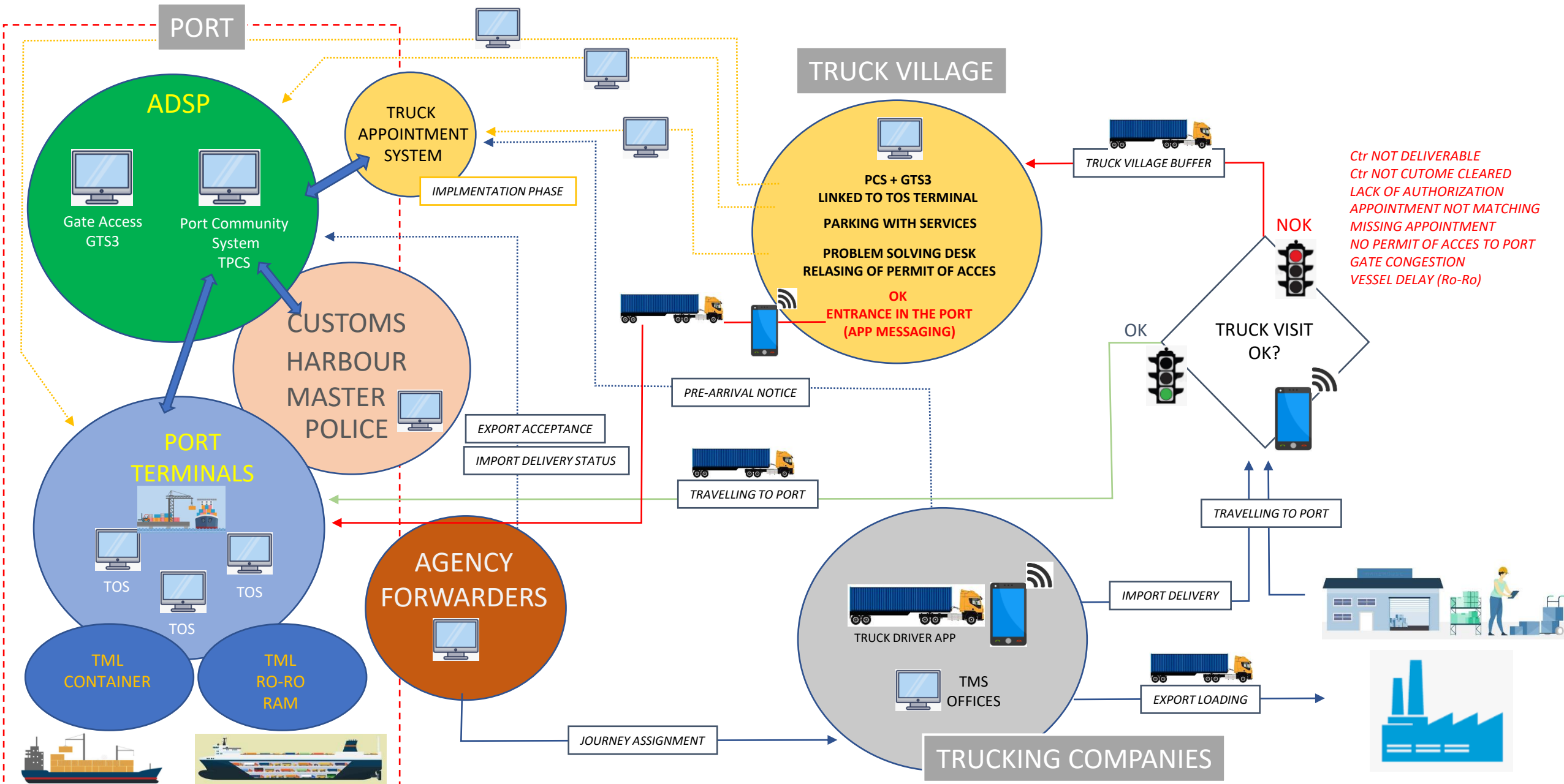
PORT

ADSP

Gate Access GTS3

Port Community System TPCS

TRUCK APPOINTMENT SYSTEM

IMPLMENTATION PHASE

TRUCK VILLAGE

PCS + GTS3
LINKED TO TOS TERMINAL

PARKING WITH SERVICES

PROBLEM SOLVING DESK
RELASING OF PERMIT OF ACCES

OK
ENTRANCE IN THE PORT
(APP MESSAGING)

TRUCK VILLAGE BUFFER

Ctr NOT DELIVERABLE
Ctr NOT CUTOME CLEARED
LACK OF AUTHORIZATION
APPOINTMENT NOT MATCHING
MISSING APPOINTMENT
NO PERMIT OF ACCES TO PORT
GATE CONGESTION
VESSEL DELAY (Ro-Ro)

NOK

OK

TRUCK VISIT OK?

CUSTOMS HARBOUR MASTER POLICE

PORT TERMINALS

TOS   TOS

TOS

EXPORT ACCEPTANCE

IMPORT DELIVERY STATUS

PRE-ARRIVAL NOTICE

TRAVELLING TO PORT

TRAVELLING TO PORT

AGENCY FORWARDERS

IMPORT DELIVERY

TRUCK DRIVER APP

TMS OFFICES

EXPORT LOADING

TML CONTAINER

TML RO-RO RAM

JOURNEY ASSIGNMENT

TRUCKING COMPANIES
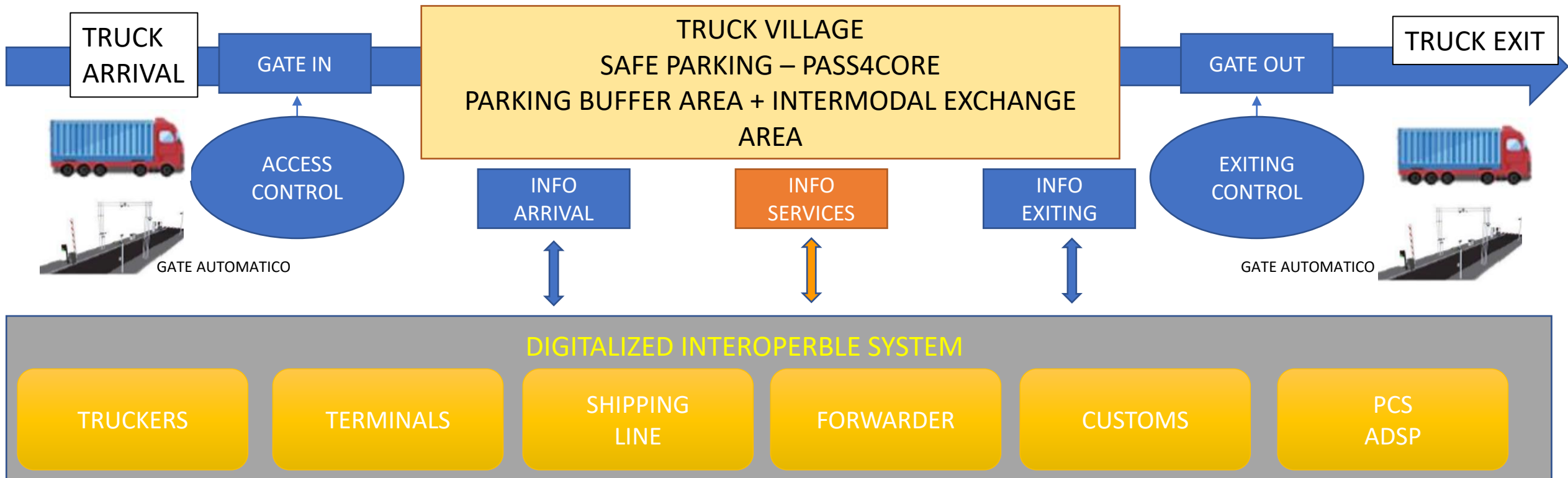
SISTEMA DI GEOFENCING

- Base sistema INFO di Truck Appointmen/PCS system
- Identificazione Posizione Truck (GPS/Mobile Phone), MOBILE APP (comunicazione con Autista)
- Sistema verifica che il camion ha passato una barriera virtuale di 50-60 km
- Verifica se il viaggio ha tutte le condizioni OK per andare a buon fine: appuntamento, prontezza carico, Prontezza doganale, Autorizzazione accesso in Porto, etc

- SE TUTTO OK Messaggio al camionista: puoi accedere al Porto/terminal entro le ore

- SE ESISTONO PROBLEMI: Messaggio al Camionista
- FERMATI Presso TRUCK VILLAGE INTERPORTO – accesso al Porto/terminal non Autorizzato

L'ESEMPIO PHARMA VALLEY

Le aziende che si insediano in ITAV hanno la possibilità di sfruttare le 4 modalità di trasporto, inclusa quella Aereoportuale, come nel caso del Pharma Valley

Le aziende insediate hanno quindi la necessità di interfacciarsi digitalmente con i Sistemi Portuali, Doganali, Terminalistici, Aereoportuali ed Interportuali, per gestire in modo ottimizzato i flussi logistici della supply chain in ingresso ed uscita

Modello Pharma Valley

Pharma Valley (Guasticce) — **Consolidamento delle consegne in piattaforma** (Area preparazione pallet aerei)

Aeroporto di Pisa — **Riduzione dei costi di pre-carriage e del transit-time** per l'imbarco (accesso diretto dalla piattaforma a bordo aereo)

Cargo Lufthansa — **Bridge diretto agli hub internazionali** tramite la predisposizione di un aereo full cargo pharma dedicato ai prodotti Pharma Valley

EU International Hub (Es: FRA)

Cargo Lufthansa

Regional Hub — Spedizione a destino tramite **All Cargo DHL** (20 destinazioni) o **Tramite compagnie aere** (vettore B)

Deconsolidamento a destino & Last Mile

Cliente

DHL — Lufthansa

INTERAZIONE SISTEMI INTERPORTO

PORTO

ADSP — Controllo Varchi GTS3, Port Community System TPCS

DOGANA CAPITANERIA GDF

TERMINAL PORTUALI — TOS, TOS, TOS, TML CONTAINER, TML RO-RO RAM

AGENZIE SPEDIZIONIERI

INTERPORTO

TRUCK VILLAGE — PARKING TRUCK SYSTEM, PASS4CORE

GATE E SORVEGLIANZA — AREA VIDEOSORVEGLIATA

TERMINAL FERROVIARIO — TOS

COLD VILLAGE — WMS, TEMPERATURE CONTROL

ULTIMO MIGLIO — TRUCK DRIVER APP

SISTEMI IT AZIENDE INTERPORTO

AUTOTRASPORTO — TRUCK DRIVER APP, TMS UFFICI

AEREOPORTO — TRUCK DRIVER APP, SISTEMI AEREOPORTUALI

RETI INTERPORTI RETI TEN-T — Freight Village System Piattaforma Logistica Nazionale, PASS4CORE

Un nuovo concept di piattaforma fisica abilitata dal digitale per gestire i flussi logistici End-to-End e le informazioni in tempo reale vs tutti gli attori coinvolti ...

DATA ANALYTICS

Control Tower, event management & business Analytics

TRANSPORTATION MANAGEMENT SYSTEM

Supplier Data — Supplier planning

SUPPLY CHAIN PLANNING — Warehouse flow planning — Transportation planning

Customer Data

Materie prime — Materiale confezionamento

SUPPLIER LOGISTIC PORTAL

NAVETTAGGI PIATTAFORMA - PLANT

MP / CONF — PF

APP CLIENTI

Importatore / Grossista — Ospedale — Farmacia — Paziente / e-commerce

Controllo real time della supply chain & data insights | **Disponibilità futura del prodotto automaticamente aggiornata** | **Governance / presidio flussi trasporto** | **Cliente aggiornato real time via APP**

STANDARD OF COMMUNICATIONS vs SUPPPLIERS & COURIERS & CUSTOMERS

4

UN SISTEMA LOGISTICO INTERMODALE INTEGRATO END-TO-END
Porto-ITAV-Rete Nazionale Interporti in grado di offrire alternative efficienti e flessibili alla merce

Linea ferroviaria Collesalvetti-Vada raggiungibile al completamento del **PROGETTO RACCORDO**

TRASPORTO SU GOMMA

30 km

merci

merci

INTERPORTI NAZIONALI
Bologna, Verona, Padova

GATE REMOTO PORTO LIVORNO

SHUTTLE RAIL

COLD VILLAGE

PHARMA VALLEY

Livorno
INTERPORTO VESPUCCI

Inquilini **INTERPORTO**

SHUTTLE RAIL

Livorno **PORTO**

Terminal **CONTAINER**

Terminal **A.D.M.**

SHUTTLE TRUCK

TRUCK VILLAGE

Merci 30 km

INDUSTIRE E MERCI DEL TERRITORIO

AREOPORTO

SHUTTLE RAIL

Prato **INTERPORTO TOSCANA CENTRALE**

GATE REMOTO PORTO LIVORNO

VANTAGGI
- ✓ Tempi di trasferimento garantiti
- ✓ Riduzione emissioni di CO2
- ✓ Decongestionamento della SGC FI-PI-LI
- ✓ Riduzione incidenti stradali

...DA FARE
- ✓ Ultimazione scavalco ferroviario
- ✓ Realizzazione progetto RACCORDO
- ✓ DIGITALIZZAZIONE DEI PROCESSI OPERATIVI

Conferimento merci:
- ✓ distretto tessile
- ✓ distretto mobile
- ✓ distretto conciario
- ✓ distretto moda ,

22/11/2021 REV01

Thank You For Your Attention

COLD VILLAGE: Part of Livorno Cold Chain

Source: AdSP Mar Tirreno Settentronale – Cold Chain

Source: AdSP Mar Tirreno Settentronale – Cold Chain

Intermodality - Multimodality
Modal Split of Inland Freight Transport

Intermodal transportation. The movements of passengers or freight from an origin to a destination relying on a sequence of transportation modes. Each carrier is issuing its own ticket (passengers) or contract (freight). Transfers from one mode of transport to another are commonly taking place at a specifically designed terminal.

Multi-modal transportation. The movements of passengers or freight from an origin to a destination relying on several modes of transportation using one ticket (passengers) or contract (freight). Technically the same as intermodal transportation, but represents an evolution requiring a higher level of integration between the actors involved such as carriers and terminal operators.

Multi-modal transportation network. A logistically linked system using two or more transport modes with a single rate. Modes have common handling characteristics, permitting freight (or people) to be transferred between modes during a movement between an origin and a destination. For freight, it also implies that the cargo does not need to be handled, just the load unit, such as a pallet or a container
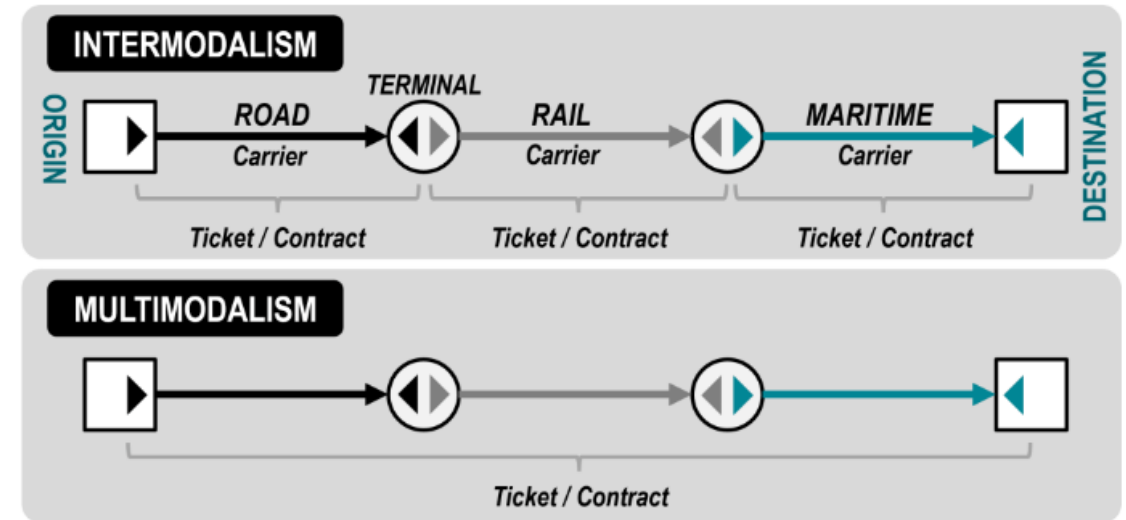
EU talks about MULTIMODAL APPROACH

Intermodality - Multimodality
Modal Split of Inland Freight Transport

EU 2010-2020 Based on Tonne-Kilometers

Truck increased to 78%

Road — Rail — Inland waterways

Source: Eurostat (online data
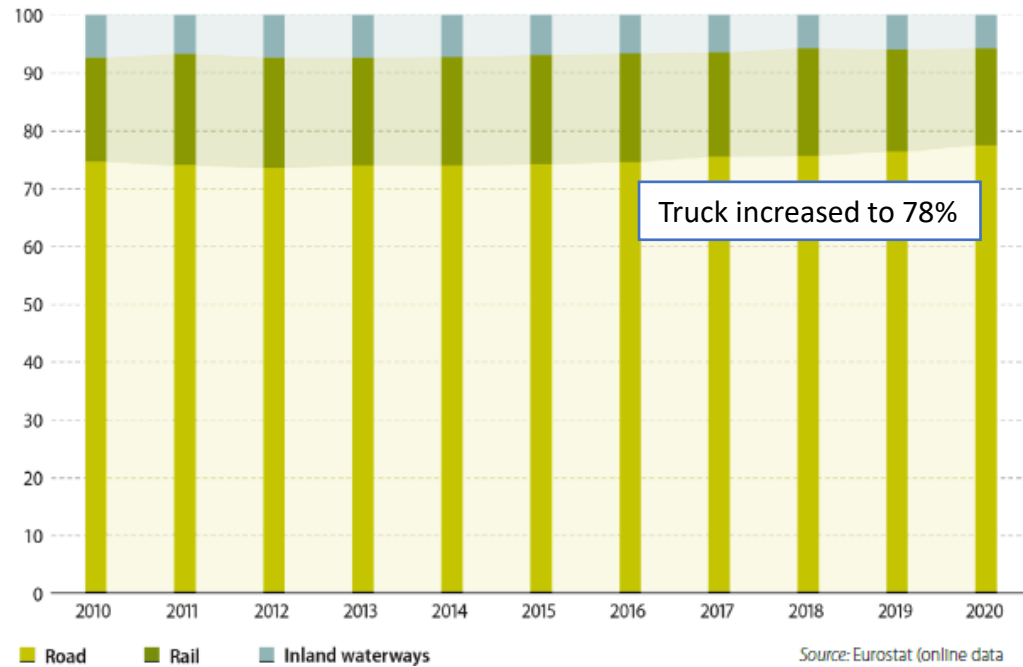
Road transportation still dominant
In Italy it is close to 90%

EU 2021 Based on Tonne-Kilometers
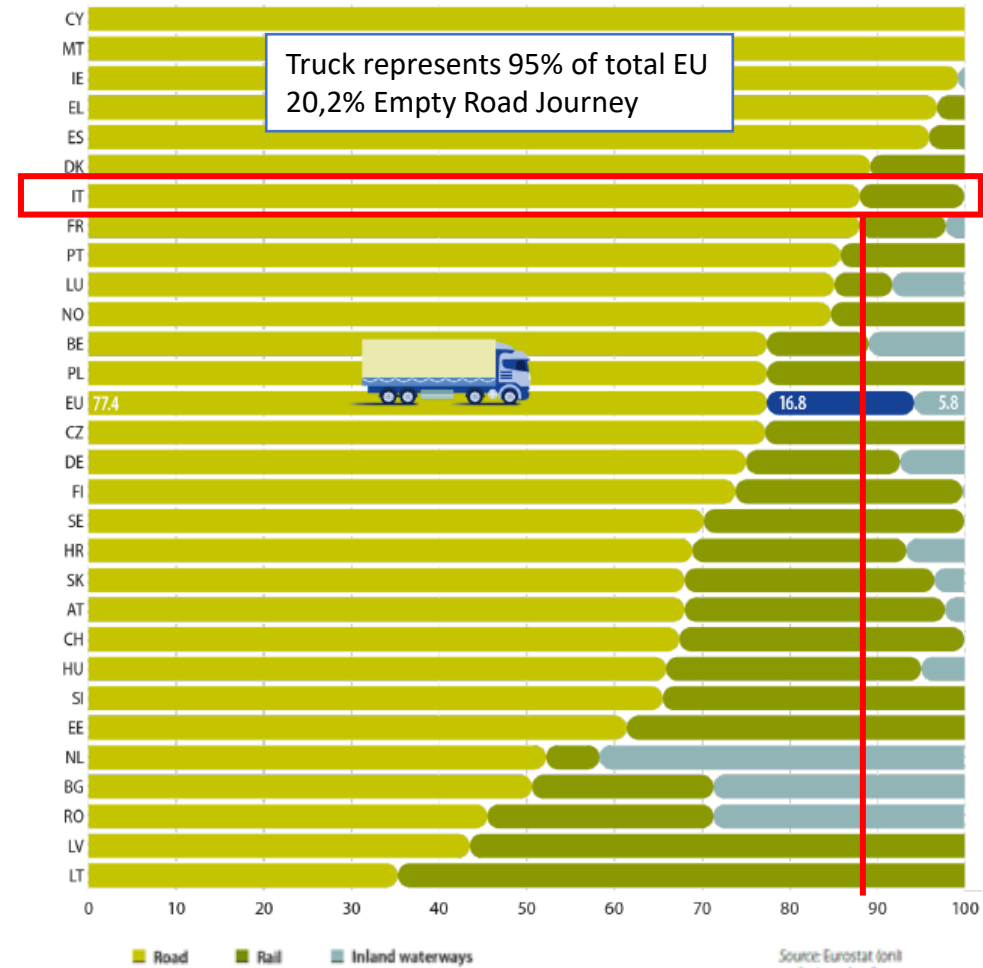
Truck represents 95% of total EU
20,2% Empty Road Journey

EU 77.4 — 16.8 — 5.8

Road — Rail — Inland waterways

Source: Eurostat (onl

EU 2021 Based on Tonne-Kilometers

Germany 30,8%
123 Billions Tonne – Km

EU total
399.4
billion
tonne-km
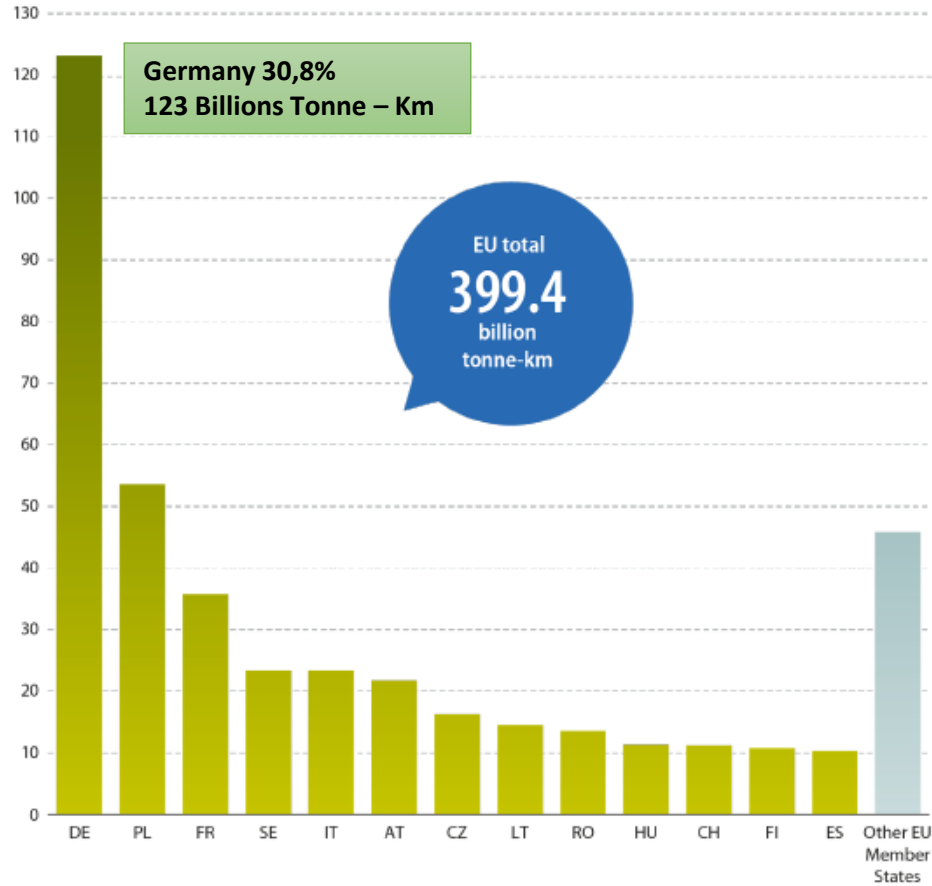
Note: no railways in CY and MT. BE: not available.

Source Eurostat (online data code: rail_go_typepas)

Distribution by type of transport, 2021

- Transit
- International unloading
- International loading
- National
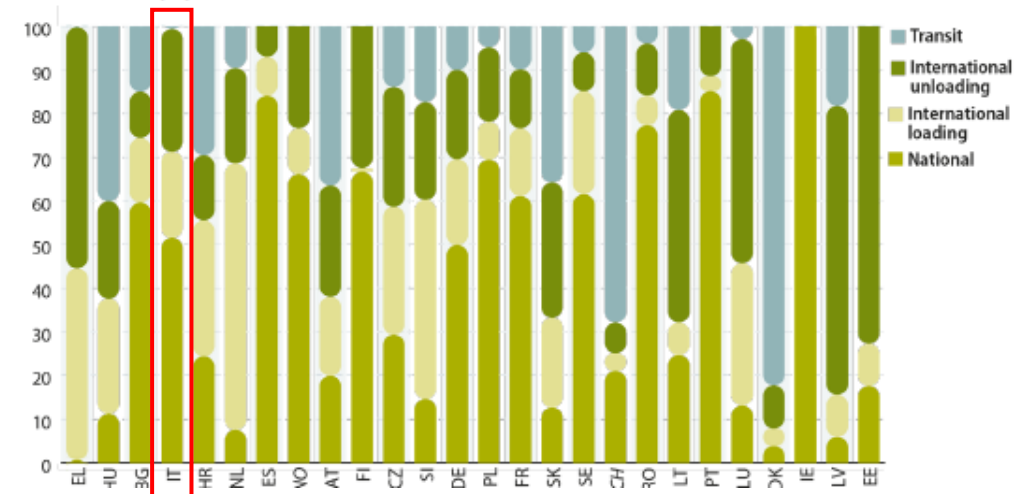
Rail transportation development different in European Countries as well as the split among National and International transportation

Intermodality - Multimodality
Air Freight Transport

Air Freight Transport is dedicated to High Value, Low Weight, Time Sensitive Cargo.
In 2021-2022 Volume increase as a consequence of Maritime Transportation disruption.
In each country Air Cargo Volume are concentrated in Few Airport (i.e. Italy Malpensa is doing 82% and Fiumicino 15%)
Difficult synergy with Maritime and Rail Transportation

Top 10 Cargo Airport 2020-2021

Airport	2020	2021
Frankfurt (DE)	1.9	2.3
Paris–Charles de Gaulle (FR)	1.7	2.1
Amsterdam Schiphol (NL)	1.5	1.7
Leipzig/Halle (DE)	1.4	1.6
Liege (BE)	1.0	1.3
Luxembourg (LU)	0.9	1.1
Cologne Bonn (DE)	0.8	1.0
Milan Malpensa (IT)	0.5	0.7
Brussels (BE)	0.5	0.7
Adolfo Suárez Madrid–Barajas (ES)	0.4	0.5

Tons x 1000

Source: Eurostat (online data code: avia_gooa)
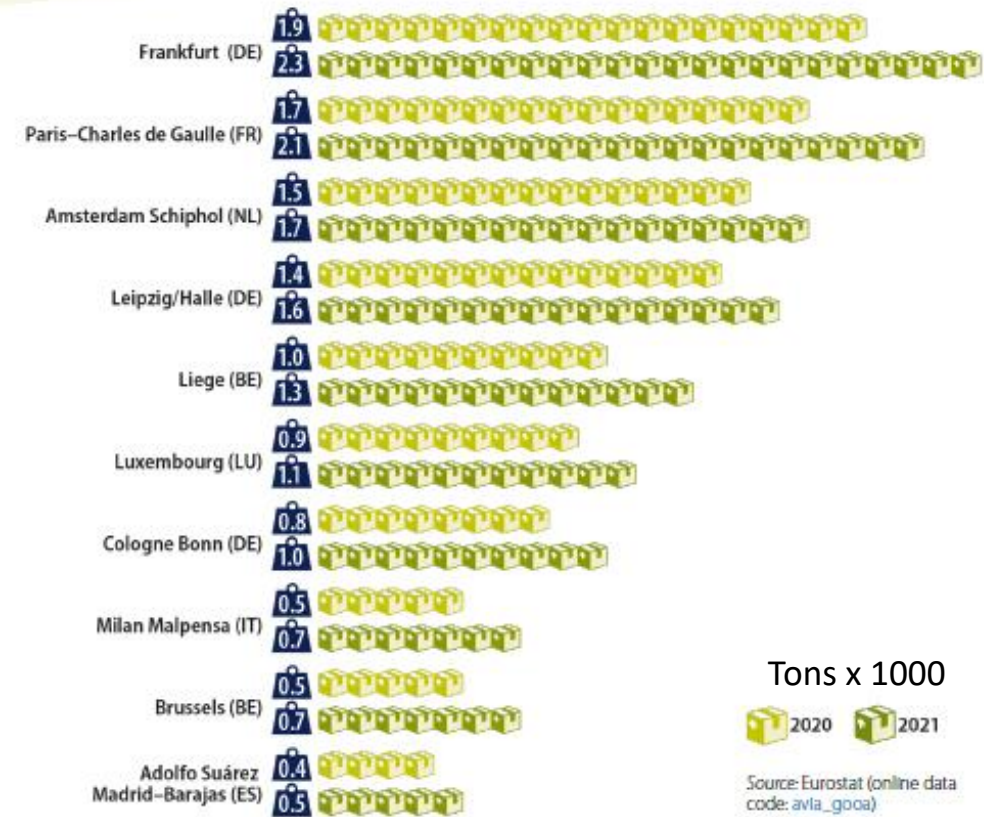
Intermodality - Multimodality
EU view for Sea- Rail- Road Integration

EU policy is to develop a Multimodal Approach, trough integrations and optimization of the various means of transportation

Land infrastructure, Ports, Freight Villages, Rail Network and Road Network must be adapted to future traffic volumes

Optimization of transportation processes through digitalization is a must

Figure 1 European core network corridors and ro-ro shipping routes

Core Network Corridors
- Baltic-Adriatic
- North Sea-Baltic
- Mediterranean
- Orient-East Med
- Scandinavian-Mediterranean
- Rhine-Alpine
- Atlantic
- North Sea-Mediterranean
- Rhine-Danube

Regular roro connections
- 1 dep/w
- 2-5 dep/w
- 5-14 dep/w
- 14-28 dep/w
- >28 dep/w
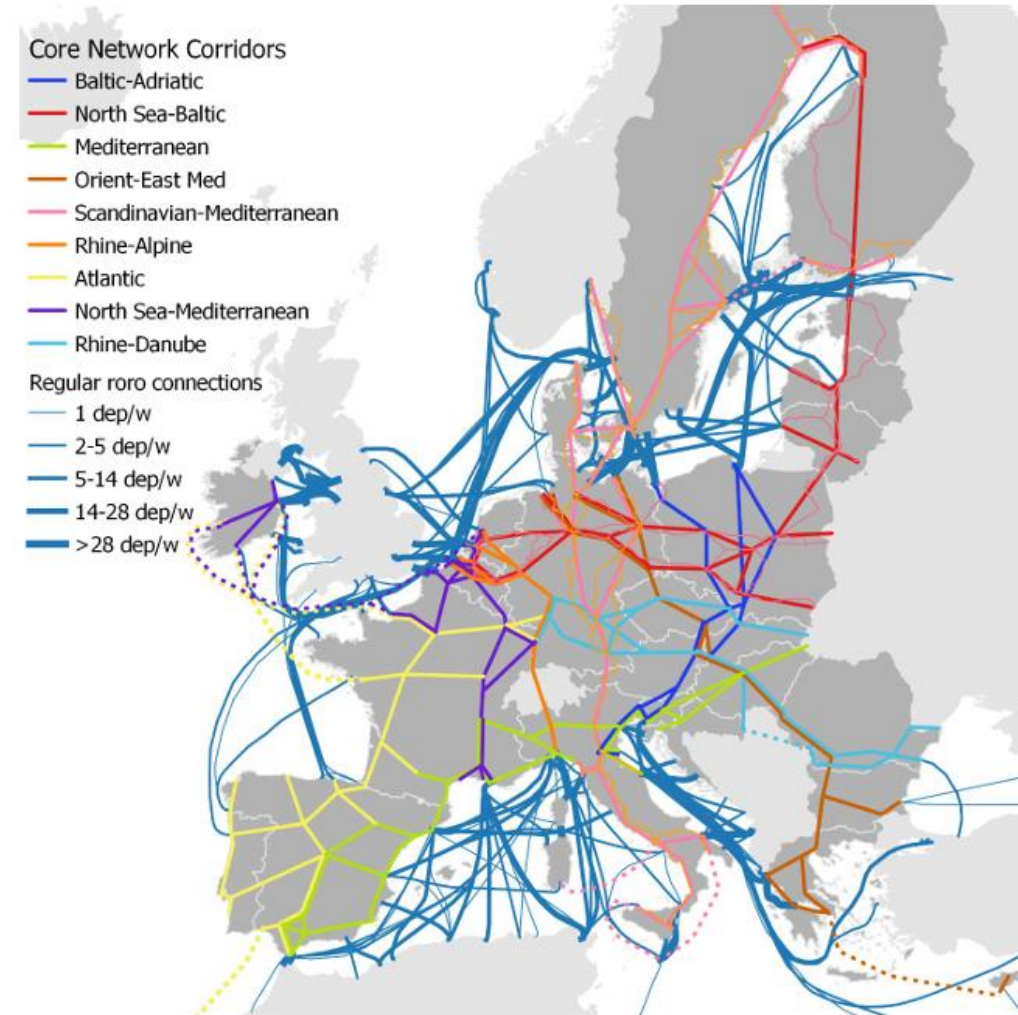
Note: Core network corridors preliminary; ro-ro shipping routes exclude regular car carriers
Source: ISL, 2021

Locations and Connections
Port Connection – Overseas

Trieste
Vado Ligure
Genoa
Venezia
La Spezia
Leghorn
Ravenna
Civitavecchia
Naples
Salerno
Gioia Tauro

North Europe
North America
West Africa
South America

Asia – Far East – India Subcontinent
Middle East – Arabiic Gulf

Locations and Connections
Port Connection – Mediterranean

Locations and Connections
Port Connection – Mediterranean Motorways of the Sea

MoS Cargo Transportation +41% 2014-2022
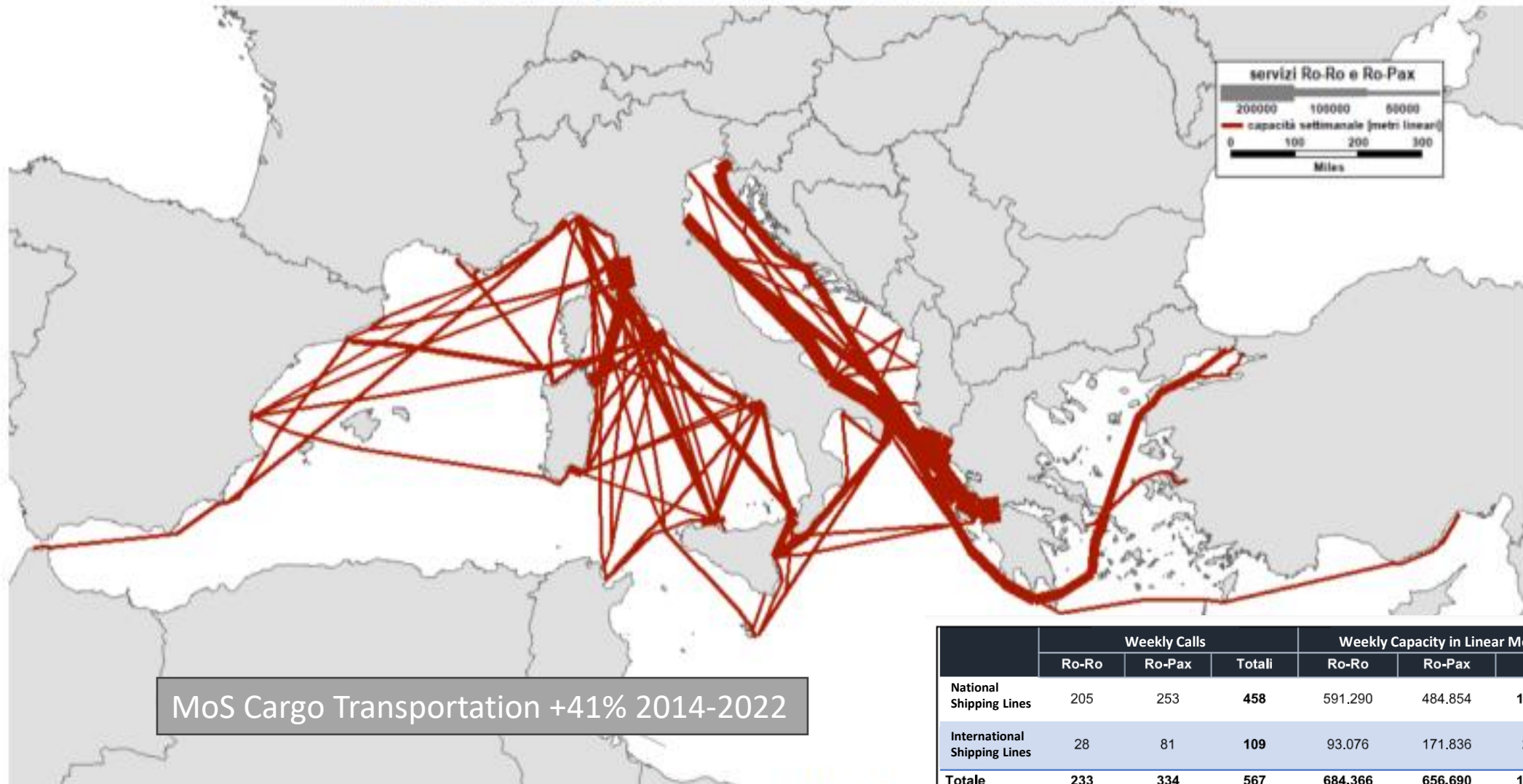
	Weekly Calls			Weekly Capacity in Linear Meters		
	Ro-Ro	Ro-Pax	Totali	Ro-Ro	Ro-Pax	Totali
National Shipping Lines	205	253	**458**	591.290	484.854	**1.076.144**
International Shipping Lines	28	81	**109**	93.076	171.836	**264.912**
Totale	**233**	**334**	**567**	**684.366**	**656.690**	**1.341.056**

Elaborazione RAM S.p.A.

Locations and Connections
Port Connection – Mediterranean Motorways of the Sea

Weekly Ro-Ro Capacity
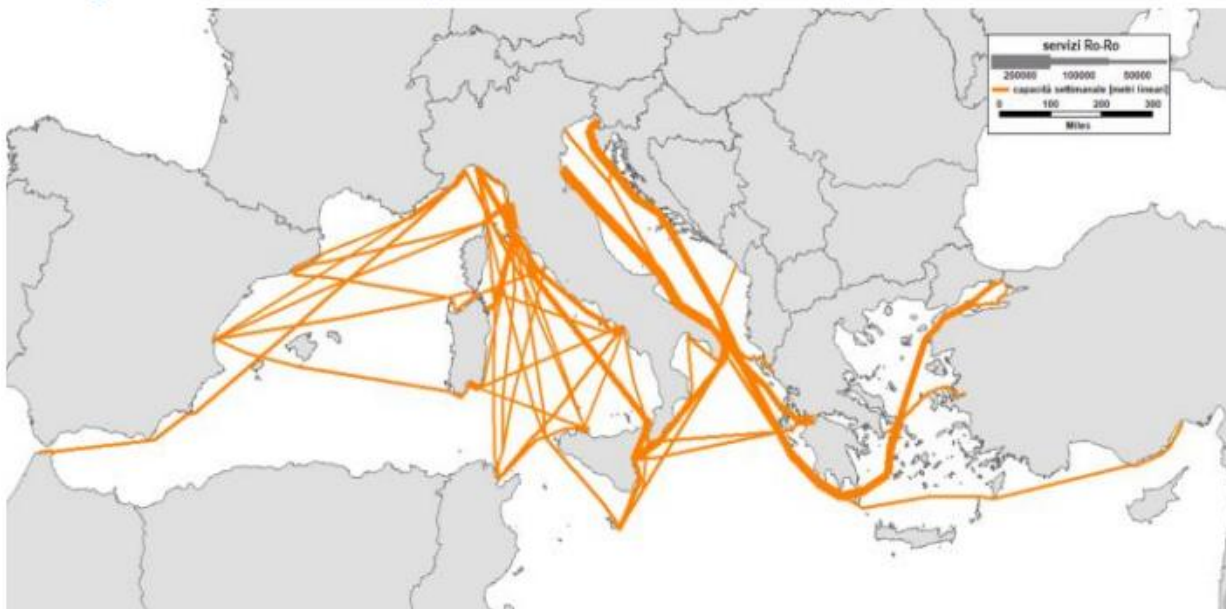
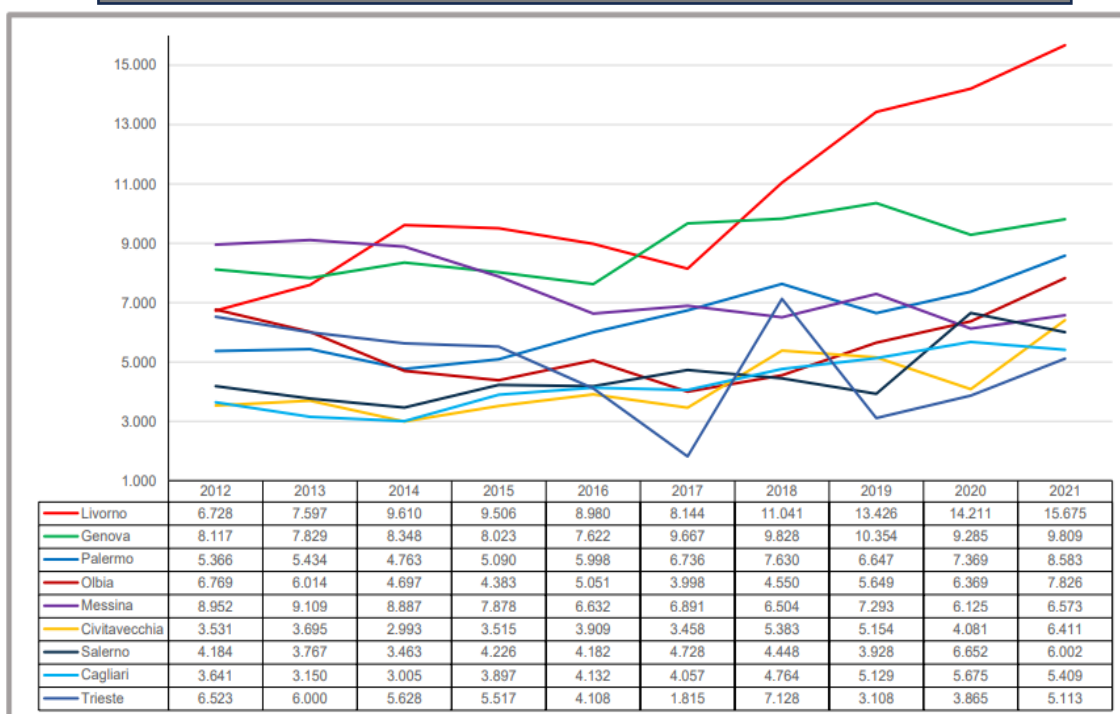### Weekly Ro-Pax Capacity

Elaborazione RAM S.p.A.

Locations and Connections
## Leghorn is the Leading Italian Port for Motorways of the Sea

Ro-RO traffic Italian Ports 2012-2021(.000 Tons)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Livorno	6.728	7.597	9.610	9.506	8.980	8.144	11.041	13.426	14.211	15.675
Genova	8.117	7.829	8.348	8.023	7.622	9.667	9.828	10.354	9.285	9.809
Palermo	5.366	5.434	4.763	5.090	5.998	6.736	7.630	6.647	7.369	8.583
Olbia	6.769	6.014	4.697	4.383	5.051	3.998	4.550	5.649	6.369	7.826
Messina	8.952	9.109	8.887	7.878	6.632	6.891	6.504	7.293	6.125	6.573
Civitavecchia	3.531	3.695	2.993	3.515	3.909	3.458	5.383	5.154	4.081	6.411
Salerno	4.184	3.767	3.463	4.226	4.182	4.728	4.448	3.928	6.652	6.002
Cagliari	3.641	3.150	3.005	3.897	4.132	4.057	4.764	5.129	5.675	5.409
Trieste	6.523	6.000	5.628	5.517	4.108	1.815	7.128	3.108	3.865	5.113

Fonte: Elaborazioni su dati Istat

National and International MoS connectivity Index
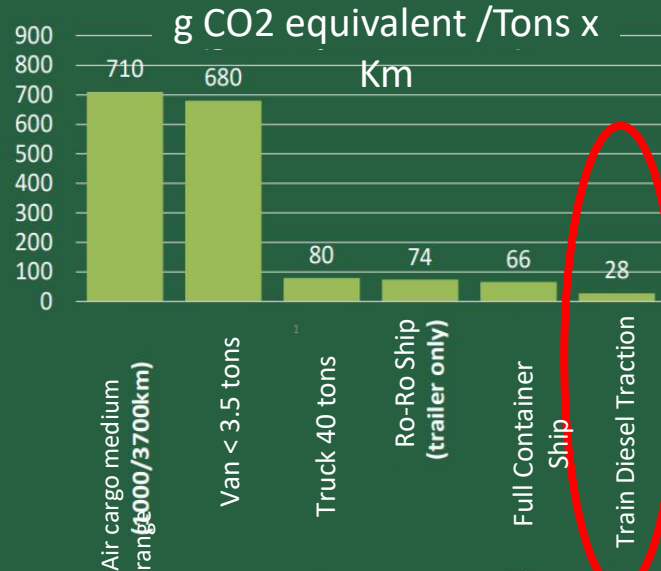

Elaborazione RAM S.p.A.

confetra
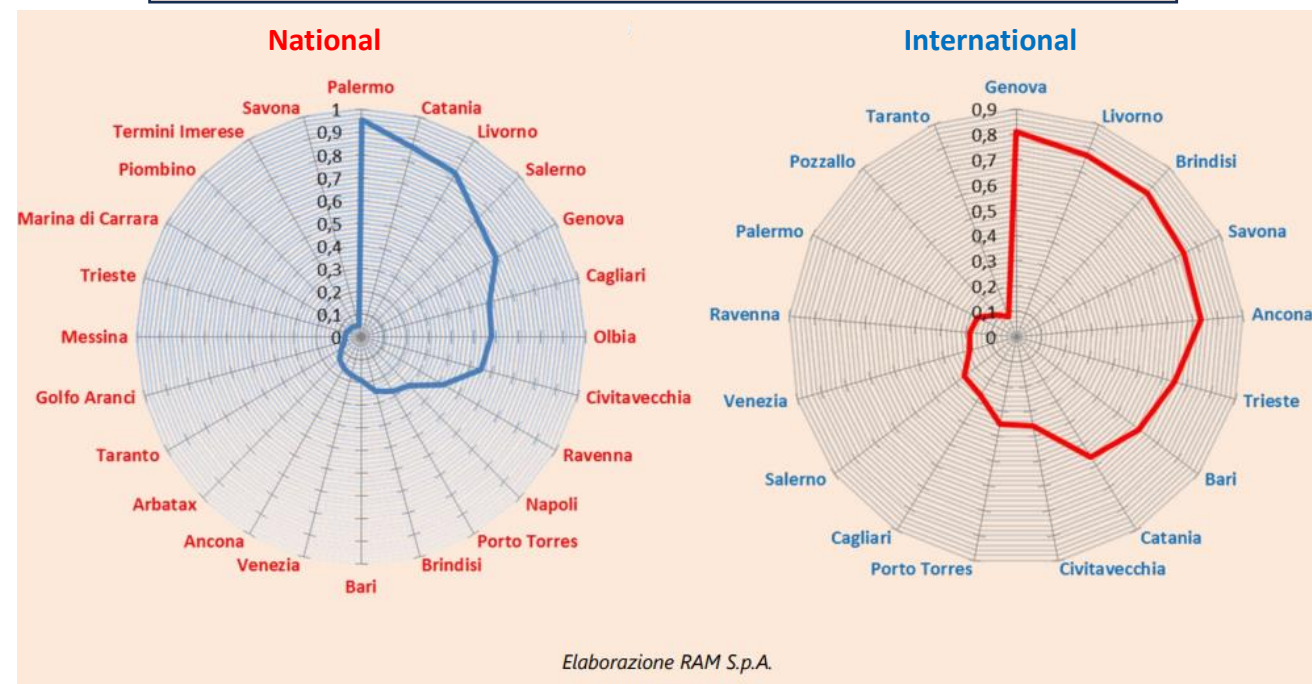
SUPPLY CHAIN SUSTAINABILITY

Supply Chain Sustainability: EU Targets Implications
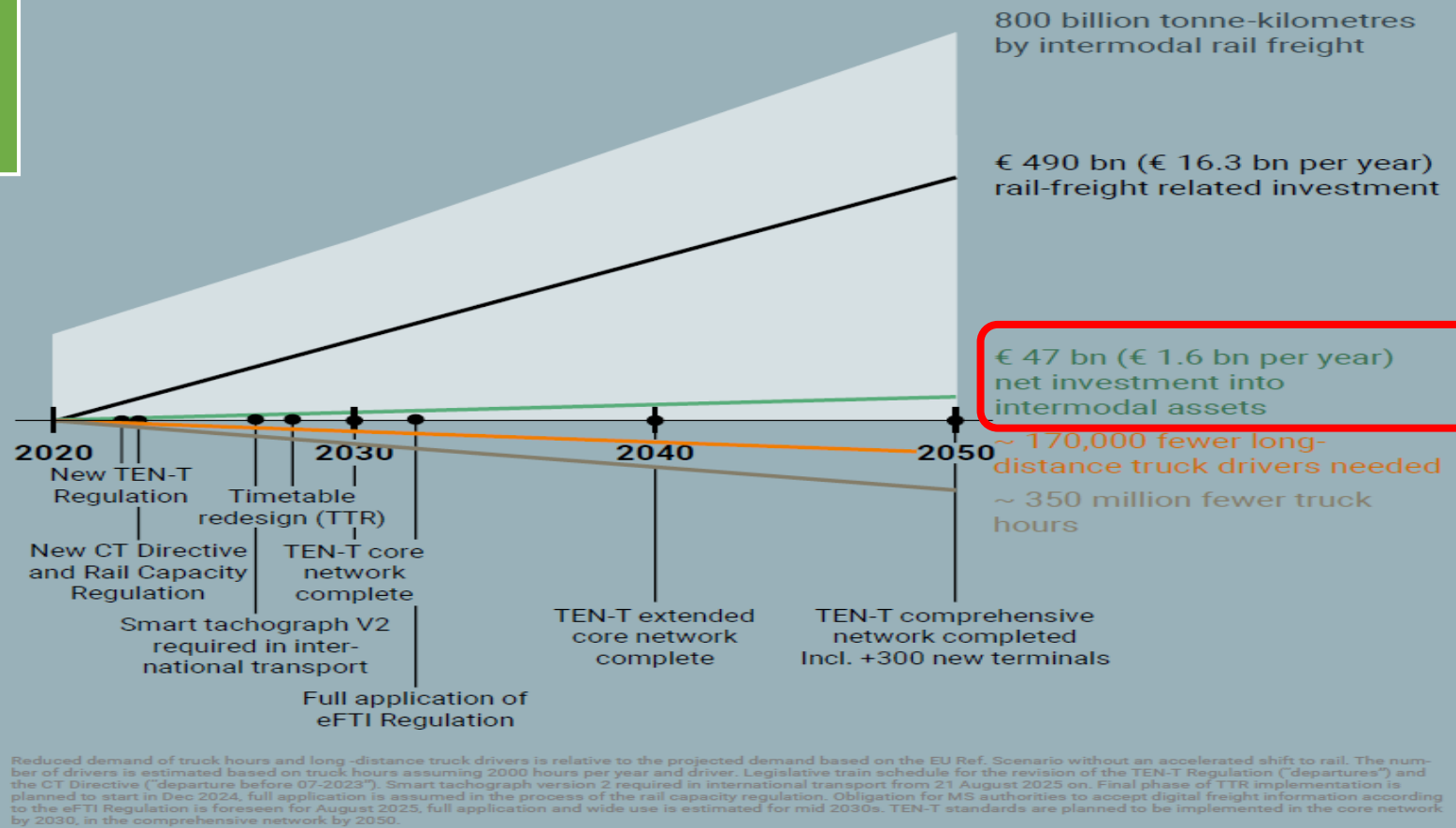
RAIL TRANSPORTATION HAS TO GROW

In order to meet European sustainability objectives for C02 emissions rail intermodal traffic needs to increase significantly

Emission by transport type in Europe

g CO2 equivalent /Tons x Km

- Air cargo medium range(2000/3700km): 710
- Van < 3.5 tons: 680
- Truck 40 tons: 80
- Ro-Ro Ship (trailer only): 74
- Full Container Ship: 66
- Train Diesel Traction: 28

[Fonte GLEC Framework 2019 – calcolato tenendo conto di Load factor ed empty running medi]

Roadmap to inland freight transport decarbonisation through zero-carbon combined transport 2020-2050

800 billion tonne-kilometres by intermodal rail freight

€ 490 bn (€ 16.3 bn per year) rail-freight related investment

€ 47 bn (€ 1.6 bn per year) net investment into intermodal assets

~ 170,000 fewer long-distance truck drivers needed

~ 350 million fewer truck hours

2020 — New TEN-T Regulation; New CT Directive and Rail Capacity Regulation

Timetable redesign (TTR); TEN-T core network complete

Smart tachograph V2 required in international transport

Full application of eFTI Regulation

2030

2040 — TEN-T extended core network complete

2050 — TEN-T comprehensive network completed Incl. +300 new terminals

Reduced demand of truck hours and long -distance truck drivers is relative to the projected demand based on the EU Ref. Scenario without an accelerated shift to rail. The number of drivers is estimated based on truck hours assuming 2000 hours per year and driver. Legislative train schedule for the revision of the TEN-T Regulation ("departures") and the CT Directive ("departure before 07-2023"). Smart tachograph version 2 required in international transport from 21 August 2025 on. Final phase of TTR implementation is planned to start in Dec 2024, full application is assumed in the process of the rail capacity regulation. Obligation for MS authorities to accept digital freight information according to the eFTI Regulation is foreseen for August 2025, full application and wide use is estimated for mid 2030s. TEN-T standards are planned to be implemented in the core network by 2030, in the comprehensive network by 2050.

Source: UIRR data elaboration

Supply Chain Sustainability: new logistic requirements

RAIL TRANSPORTATION HAS TO GROW

A **development of intermodal assets** both in ports and in freight villages with substantial investments it is needed

Rail freight in tkm	
2020	400 tkm
2050	1,150 tkm

Trains on the rail network per day	
2020	6,100
2050	13,800

Modal share of rail in long-distance transport (> 300 km)

Rail share in long distance transport

Investment costs to enable combined transport

€ 490 billion
€ 47 bn.
Rail infrastructure
Intermodal assets
CT road legs

The share of **rail transport need to be increased, either in** long-distance rail transport (>300 km) and in the short-distance and combined transportation
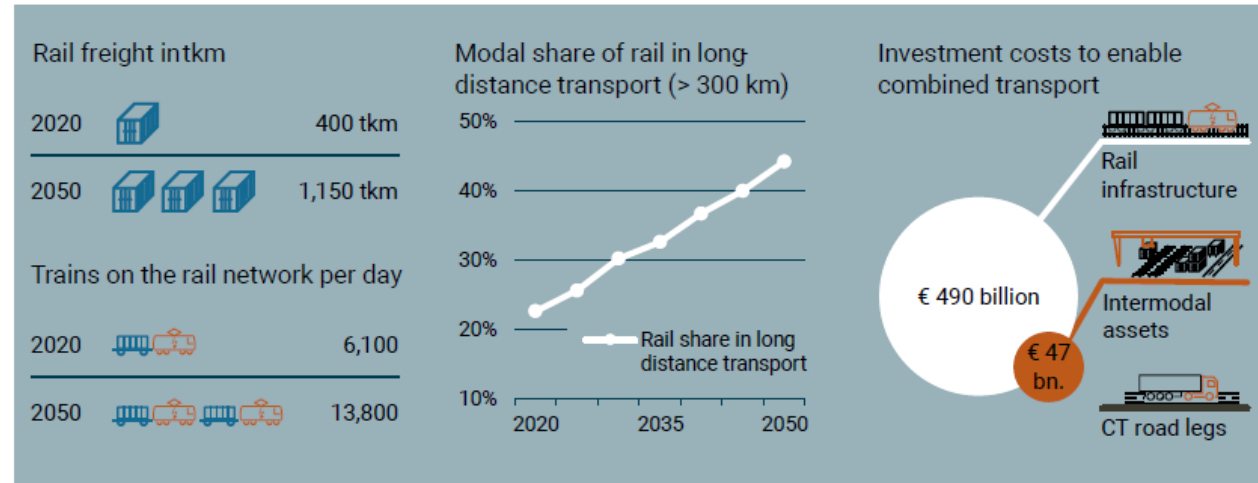
Figure 1: Projection of transported freight volumes in billion gross-tkm for surface freight, rail freight and CT. Projections based on the EU Reference Scenario for freight transport and own modelling.

Share of long-distance surface freight (> 300 km)

— Rail share in long distance transport
— — Combined Transport

Freight volume transported in billion gross-tkm

	2020	2025	2030	2035	2040	2045	2050
Inland Freight	2.377	2.750	3.050	3.200	3.350	3.500	3.600
Inland Freight > 300 km	1.688	1.950	2.150	2.300	2.450	2.500	2.600
Rail Freight	382	500	650	750	900	1.000	1.150
Combined Transport	174		370				800

Source: UIRR data elaboration

Supply Chain Sustainability: new logistic requirements

RAIL TRANSPORTATION HAS TO GROW

In order to meet European sustainability objectives for CO_2 emissions rail intermodal traffic needs to increase significantly

How to achieve the objectives:

- Adapt the TEN-T infrastructure, increasing the share of electrified sections
- Increase the speed of freight trains to an average of 100 km/h
- Increase the use of longer trains (min 750 m) and higher capacity (22.5 tons per axle)
- Adapt the templates to P400 for the transport of trailers
- Improve the % saturation of existing routes by optimizing their usage
- Develop digital traffic management (i.e. to synchronize intermodal appointments)

Table 5: Measures for capacity improvement in rail transport (in number of trains) and assessment of cost. The improvements are expressed in percentages compared to non-TEN-T compliant infrastructure.

Number of trains per year (in thousand)	EU Reference Scenario and own calculation		
2020	6,100 trains per day		
2030	9,500 trains per day (54 % increase relative to 2020)		
2050	14,700 trains per day [13,800 if 740m overall possible] (140 % increase relative to 2020)		

Capacity improvement	Increase in capacity	Calculated cost (in billion €)	Status of implementation
Improvements for train capacity			
P400 gauge	---	5	48 %
740m avg. trains	13 %	1	43 %
Optimal capacity usage (length and weight)	41 %	150	81 %
Improvements for track capacity			
ERTMS (ETCS level 2)	25 %	30	48 %
Increased avg. speed (100 km/h)	66 %	49	66 %
Electrification	---	92	80 %
Timetable redesign (TTR)	15 %	1	---
Gap assessment for 2050			
Cumulated capacity improvements[38]	<150 %	328	---

Source: UIRR data elaboration

VALUE CREATION ALONG THE SUPPLY CHAIN
Ports and Freight Villages integrated Rail Logistic

Sustainability Cost should somehow or other have an effect on the transportation costs
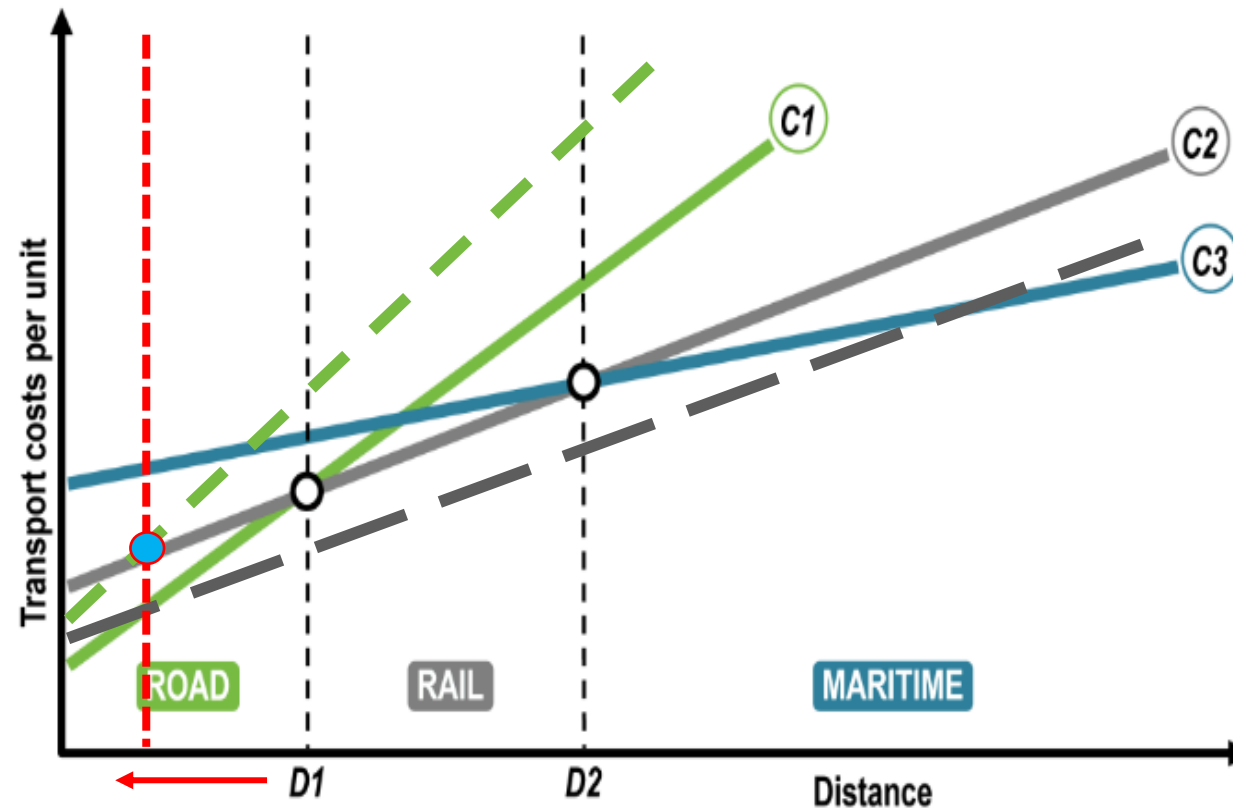
Distance Modal Choice and Transport Cost

Ursa Major Neo in the Port of Livorno

A testing ground for Cooperative Intelligent Transport Systems

Overview of UMNEO Project

- UMNEO Project was co-financed by the Connecting Europe Facility of the European Union (2017-2022)
- The project aimed at implementing ITS services for freight transport and logistics
- **TEN-T Corridors involved:**
  - Rhine–Alpine Corridor
  - Scandinavian–Mediterranean Corridor
- **Technical activities:**
  - A.02 – Services for truck parking
  - A.03 – Information about traffic and passengers
  - A.04 – Bottleneck removal
  - A.05 – Freight transport security

Co-financed by the Connecting Europe Facility of the European Union
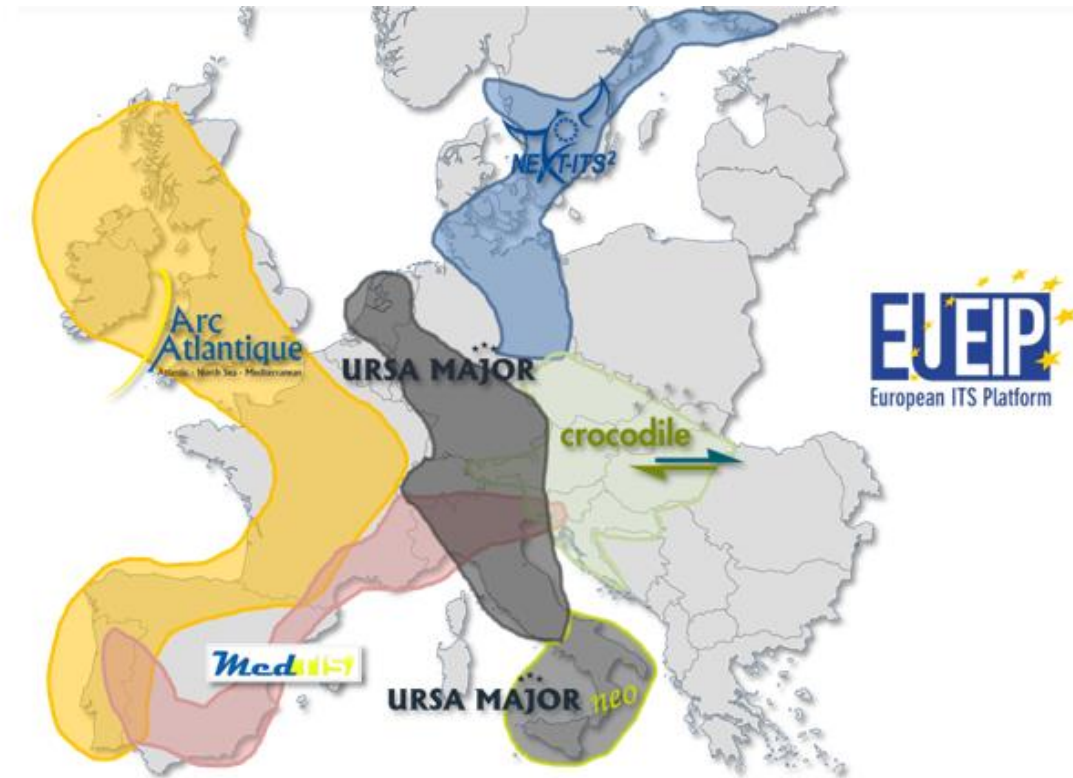
Livorno Pilot action: WHAT, WHY, HOW

WHAT WAS THE GOAL OF THE PILOT ACTION?
Developing value-added C-ITS services for port and logistics actors

WHY WAS IT IMPORTANT?

HOW DID WE GET IT?

Livorno Pilot action: UMNEO Platform 1/3

Hauler

Facility manager
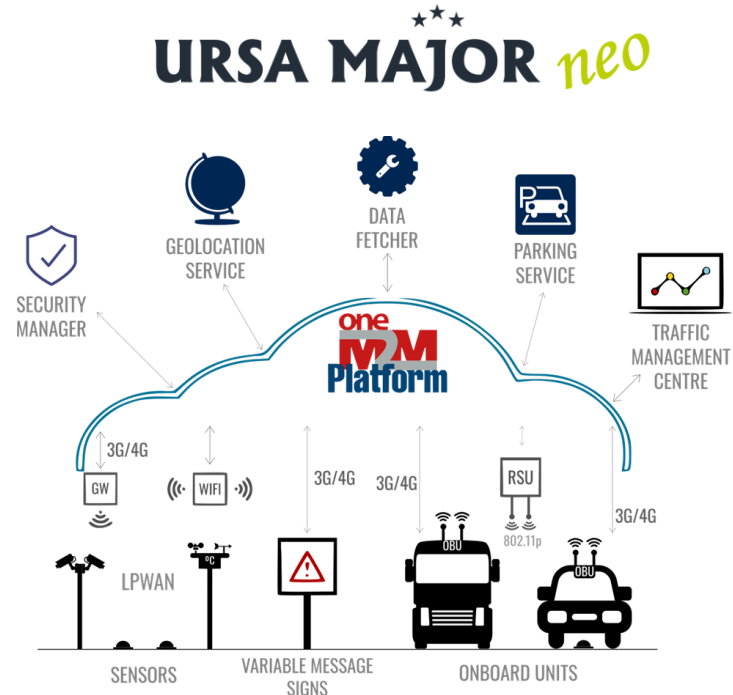
Alert Service

Smart Truck Parking

Weather conditions	Road accidents & closures	Stationary vehicles	Traffic conditions	Vehicles positions	Parking status	Port operation

Weather stations	Open weather	Datex nodes	Waze	V2X	Mobile devices	Parking sensors	ICT applications
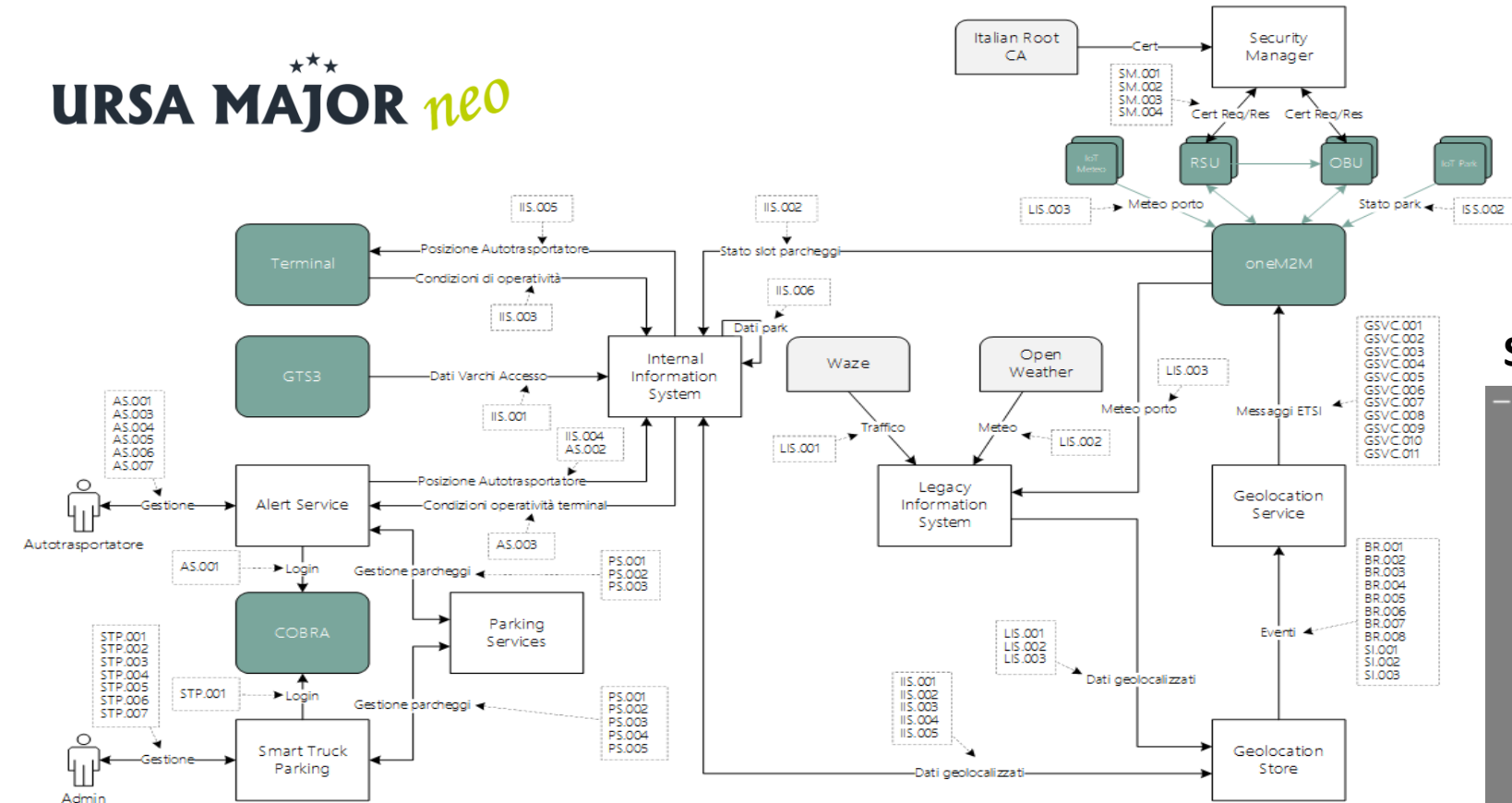
Smart Truck Parking

Livorno Pilot action: UMNEO Platform 3/3

Hauler

Port of Livorno conditions
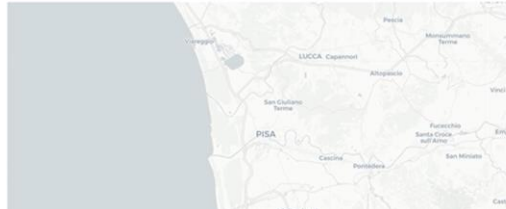
New parking reservation

Thank you

Co-financed by the Connecting Europe
Facility of the European Union

AVR GROUP

NUMBERS
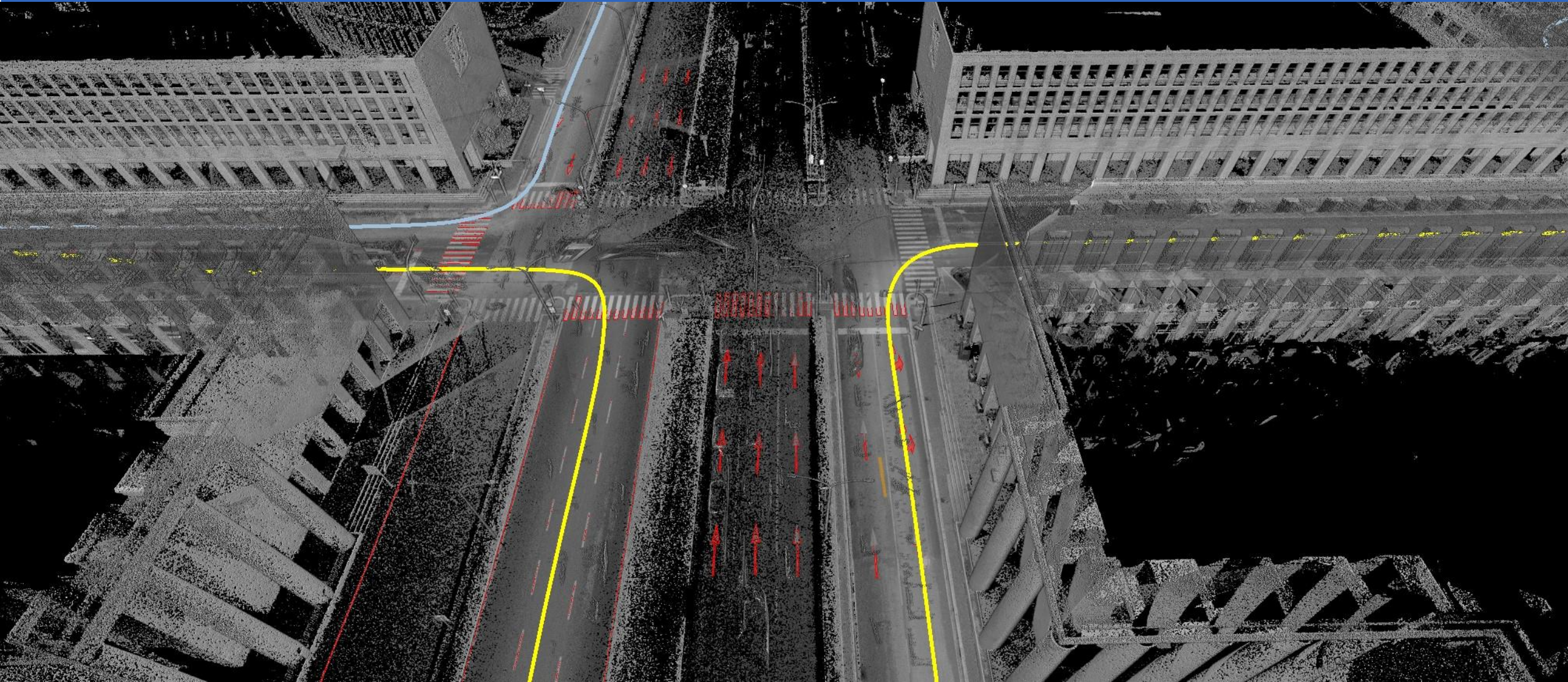
>50 years

>2,000 employees

ROAD MANAGEMENT AND MAINTENANCE

URBAN GREEN

URBAN HYGIENE SERVICES

CURRENT CHALLENGES

RAPIDLY AGING INFRASTRUCTURE

Much of the road infrastructure in many countries was built 50 years ago and is now crumbling, requiring expensive maintenance and repairs

INCREASING URBANIZATION AND TRAFFIC

More people are moving to cities, increasing congestion and wear and tear on roads

LIMITED BUDGET

Most transportation departments have limited budgets that make it difficult to keep up with maintenance and new construction demands

ENVIRONMENTAL CONCERNS

Building and maintaining roads has impacts on land use and wildlife and contributes to climate change

Managing road infrastructure is becoming increasingly complex due to aging systems, growing usage, tight budgets and environmental impacts

Digital twin

- It's a real-time digital representation of a physical object, process, or system in the real world.

- It uses data from sensors, IoT devices, simulations and mathematical models, applied to even three-dimensional models of the objects constituting urban and extra-urban territorial assets (roads and greenery).

ROADS DIGITAL TWIN

ROAD REGISTER FROM DIGITAL TWIN
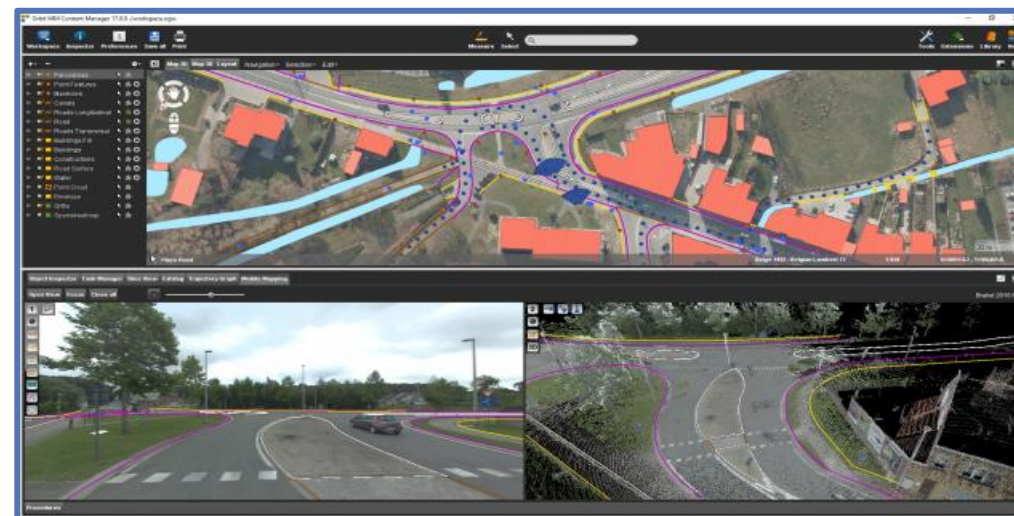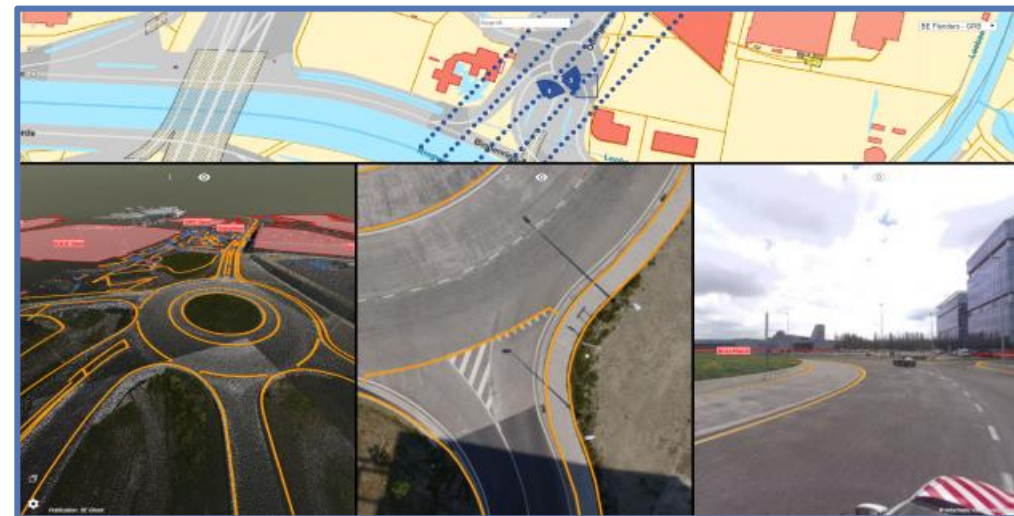
Goals

- acquisition of consistencies of the road network
- high ground of the geometric characteristics of the road platform
- census of the elements belonging to the road surface

Phases

- calibration of instruments on the road
- high ground on the road
- back-office data analysis
- graphic data rendering recorded via GIS applications
- verification and validation of the processed data

Data

- vehicle carriageways, sidewalks and cycleways
- horizontal and vertical road signage
- guardrails
- parking bollards, bike racks and other minor artefacts
- grates and drains
- hedges and single trees
- retaining walls, bridges, tunnels

ROADS DIGITAL TWIN

ASSET MANAGEMENT SOFTWARE

Benefits

- virtual tours
- overlay of multiple data
- point clouds to evaluate deformations of structures, expansions of excavations, roadwork in progress, changes in vegetation and/or heritage
- less manual effort and overall production costs
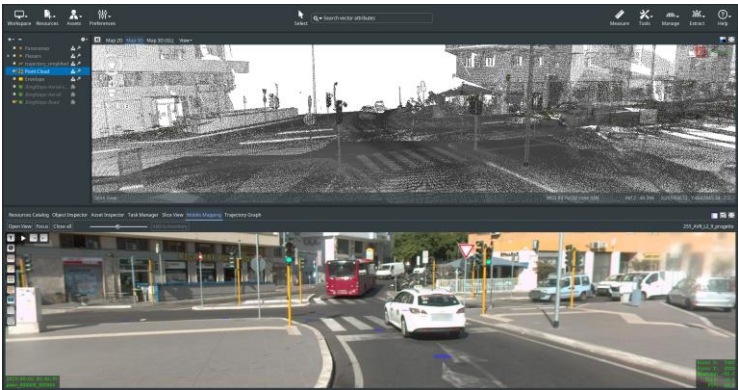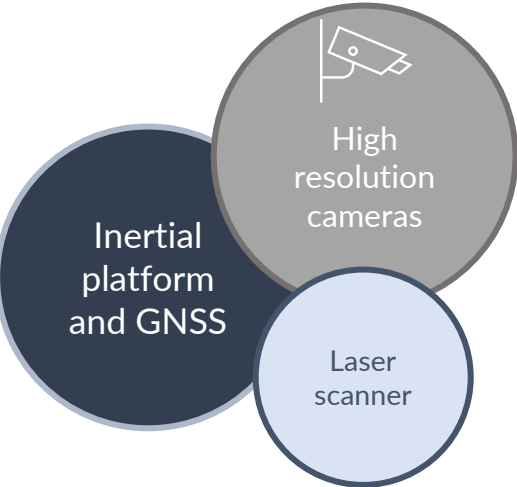- greater accuracy than obsolete technologies
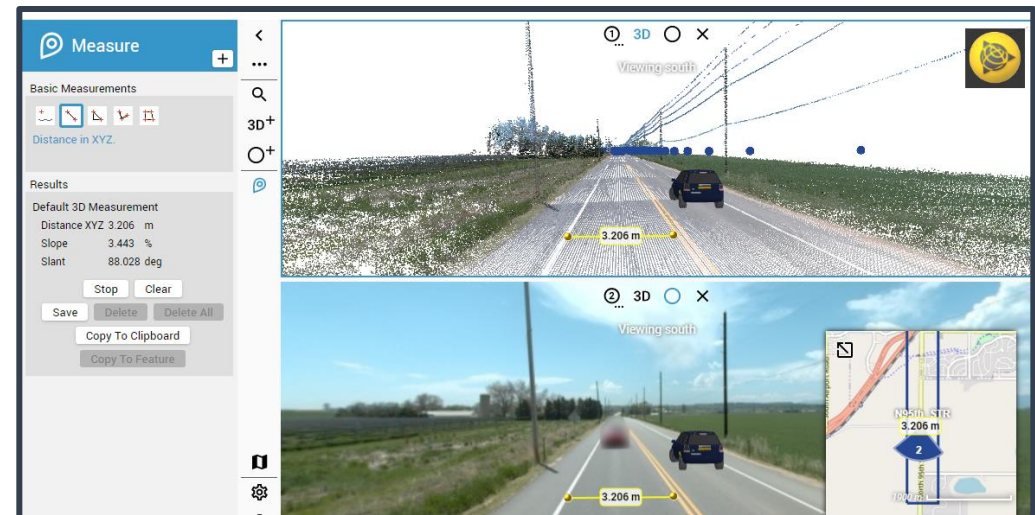
FIELD DATA ACQUISITION

INSTRUMENTS

Inertial platform and GNSS

High resolution cameras

Laser scanner

Point cloud sample

Integrated GIS-based software for Digital Twin

GNSS ANTENNA
high precision RTK GNSS antenna

MMS (MOBILE MAPPING SYSTEM)
mounted on cars, complete with processing software

DRONE
with high resolution camera

TOTAL STATION
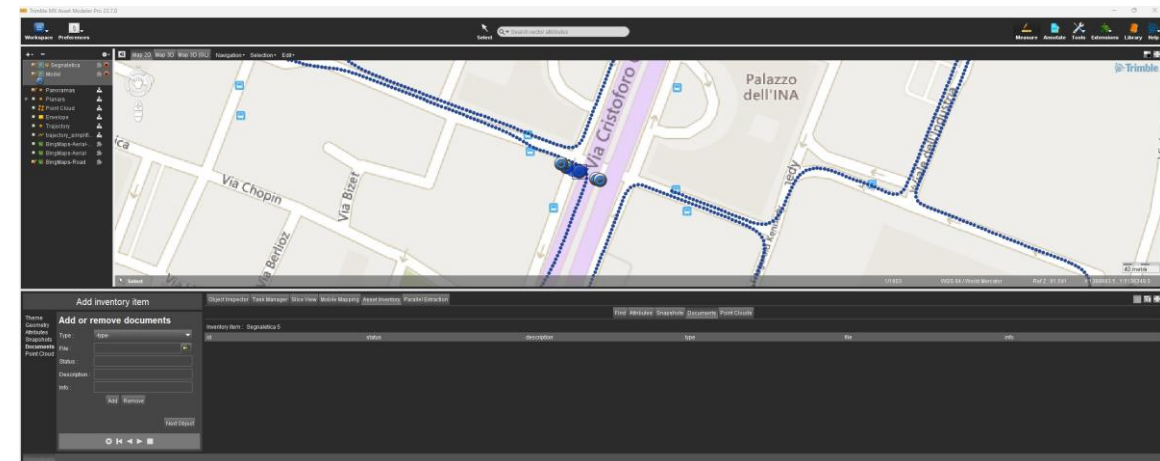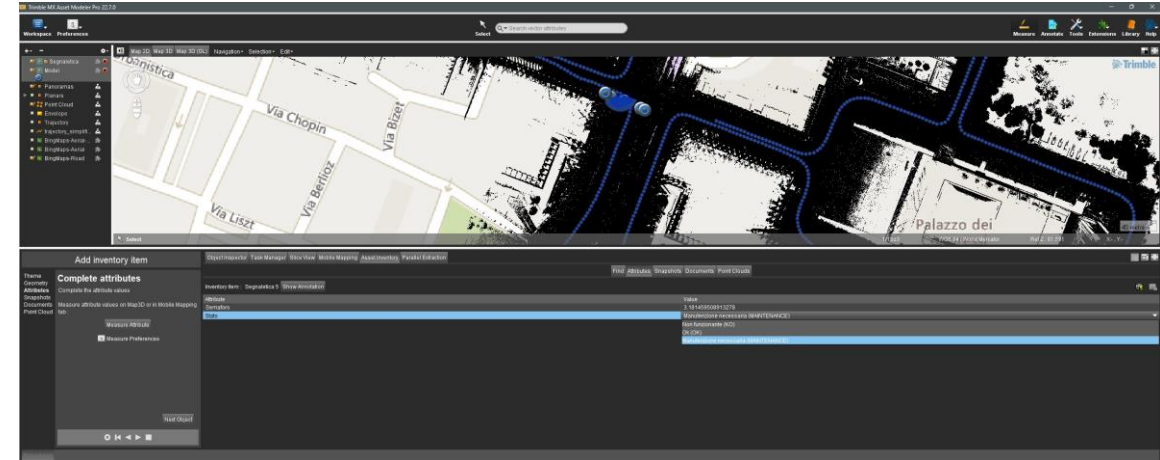with measurement function both with prism and in reflectorless mode

DYNAMIC SLAM LASER SCANNER
Integrable with 4K camera to color point clouds

FIELD DATA ACQUISITION

ROAD SIGNS EXTRACTION WITH AI SUPPORT

- **TRAFFIC MONITORING CAMERAS**

  Cameras and video technology used to observe current traffic conditions

- **TRAFFIC SIGNALS AND RAMP METERING**

  Interconnected traffic signals and ramp meters to optimize traffic flow

- **VARIABLE MESSAGE SIGNS**

  Digital signs along roads providing real-time notifications and information to drivers

- **INCIDENTS DETECTION AND RESPONSE SYSTEMS**

  Systems to quickly detect incidents like accidents and send response

- **ELECTRONIC TOLL COLLECTION**

  Electronic toll systems for automated toll payment collection

- **VEHICLE TO INFRASTRUCTURE COMMUNICATION**

  Technology enabling communication between vehicles and road infrastructures

- **TRAVELER INFORMATION SYSTEMS**

  Systems providing real-time traffic information via web, mobile, radio

- **COMMERCIAL VEHICLE TRACKING**

  Systems tracking location and movement of trucks for logistics

180

AND THE FUTURE IS COMING...

THANK YOU!

Headquarters
Via Francesco Tensi, 116
00133 Roma

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Email
info@avrgroup.it
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Follow us

ANNEX 2

SIGNATURE LIST OF ATTENDANCE

Co-funded by
the European Union

MERIDIAN

CAPITALISATION WORKSHOP ON THE MULTIMODAL ACTIVITIES

LIVORNO
13 december 2023
Interporto Toscano Amerigo Vespucci

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16	PIERANGELO PERDONI	AVR TECH	pierangelo.perdoni@avrgroup.it	3358253905
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20	ROFFAELLO CIONI	INTERPORTO	cioni@interportotoscano.com	342 6335339
21	IVANO TONI	AdSP. MTS	i.toni@portialtotirreno.it	33879 82978
22	SARA BERNI	AVR	SARA.BERNI@AVRGRUP.IT	3458000052
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ANNEX 3

THE LIST OF DIGITAL ATTENDANCE

Co-funded by
the European Union

Capitalisation Workshop in Italy, 13.12.2023, Digital Attendance List:

- Björn Siebert
- Alberto Milotti
- Stefano Terribile
- Jean Walravens
- Clara Rybin
- Mirko Vindimian
- Veronika Carli
- Edwin van Hassel
- Michael Trees