MILOS
INTELLIGENCE

OPTIMISATION & ARTIFICIAL INTELLIGENCE

OVERVIEW OF CIRCLE GROUP

Circle Group

is an international player specialised in providing innovative technological solutions for **automation and digitalisation of the entire Supply Chain,** with distinctive vertical skills in the port and intermodal logistics sectors.

Through a vertically integrated business model, the Group completes its offering with services supporting its clients in gathering European funding and achieving a strategic positioning at European level.

Within the Innovative and Smart Supply Chain Business Unit, the new business line "**Optimization & AI**" dedicated to the development of optimization tools for the port and logistics sectors as a whole was born.

Milos · Intelligence

Circle Group

PRODUCTS	TARGET	MAIN CLIENTS
Port Rail Shunting Optimisation Port Rail Shunting Simulation Port Rail Shunting Digital Twin	Port Rail Shunting Operators Port Authorities	FuoriMuro, ATI LSSR - MIST Ports of Trieste, Genoa, La Spezia
MTO Best Trucker Selection MTO Planning Optimisation	Multimodal Transport Operators Carriers	Metrocargo
Multipurpose Terminal Simulator Multipurpose Terminal Digital Twin	Maritime & Inland Terminal	Terminal San Giorgio

TECHNOLOGIES

ARTIFICIAL INTELLIGENCE	OPTIMISATION	OPERATION RESEARCH	BUSINESS INTELLIGENCE	SIMULATION	DIGITAL TWIN

OPTIMISATION & AI
IN RAIL LAST MILE

Inland Terminal & Road Network

- MTO Planning Optimisation
- Best Trucker Selection

Maritime Terminal

- Terminal Rail Shunting Cycle Optimization
- Multipurpose Terminal & Digital Twin

Shunting Area & Rail Network

- Port Rail Shunting Optimisation
- Port Rail Shunting Simulation & Digital Twin

INLAND TERMINAL & ROAD NETWORK

Circle Group

MTO PLANNING OPTIMISATION

A decision support system that suggests routes involving triangulated and combined journeys in order to optimize the path based on criteria such as costs, time, distances, and environmental impact and provide more efficient and sustainable transportation solutions.

BEST TRUCKER SELECTION

Designed to assist transportation operators in selecting the optimal carriers for each route, this tool allows for the examination of various forecast scenarios and guides decisions based on selected key performance indicators (KPIs).

BENEFITS

- DECISION SUPPORT SYSTEM
- TIME REDUCTION
- DISTANCE REDUCTION
- EMISSION REDUCTION & GREEN SUSTAINABILITY
- COST REDUCTION
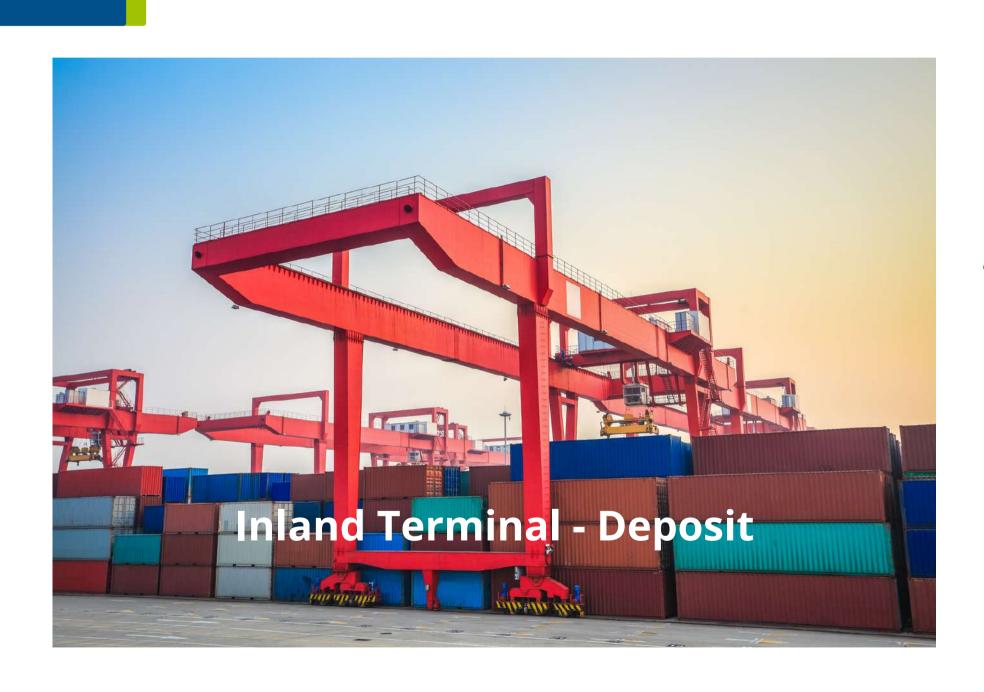
COMPATIBILITY

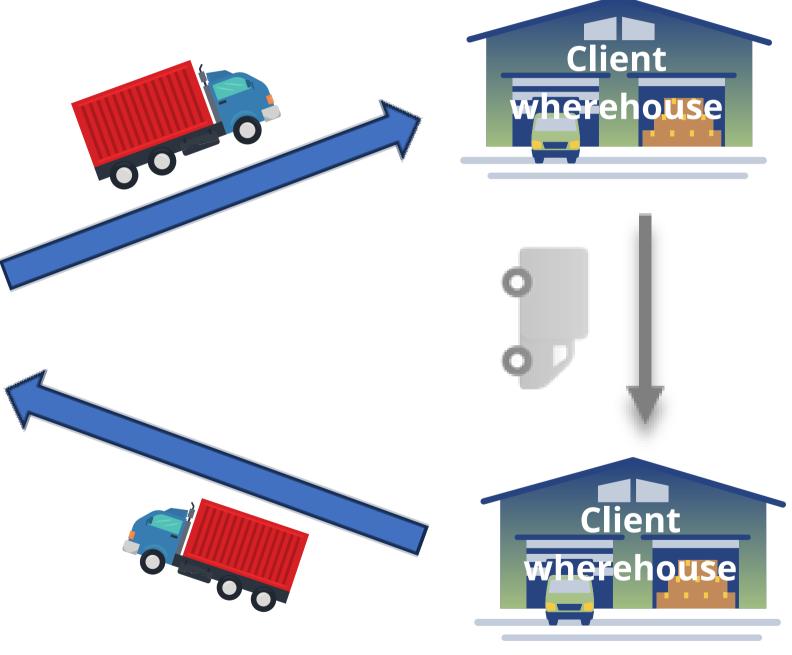✓ Commodity;

✓ Intermodal Transport Unit;

✓ Customer warehouse opening/closing times;

✓ Possible pickup/delivery time windows;

✓ Time reduction in comparison to the separate trips;

✓ Terminal pickup/delivery times;

✓ Hauler's daily working hours;

✓ Reduction in km traveled in comparison to the separate trips;
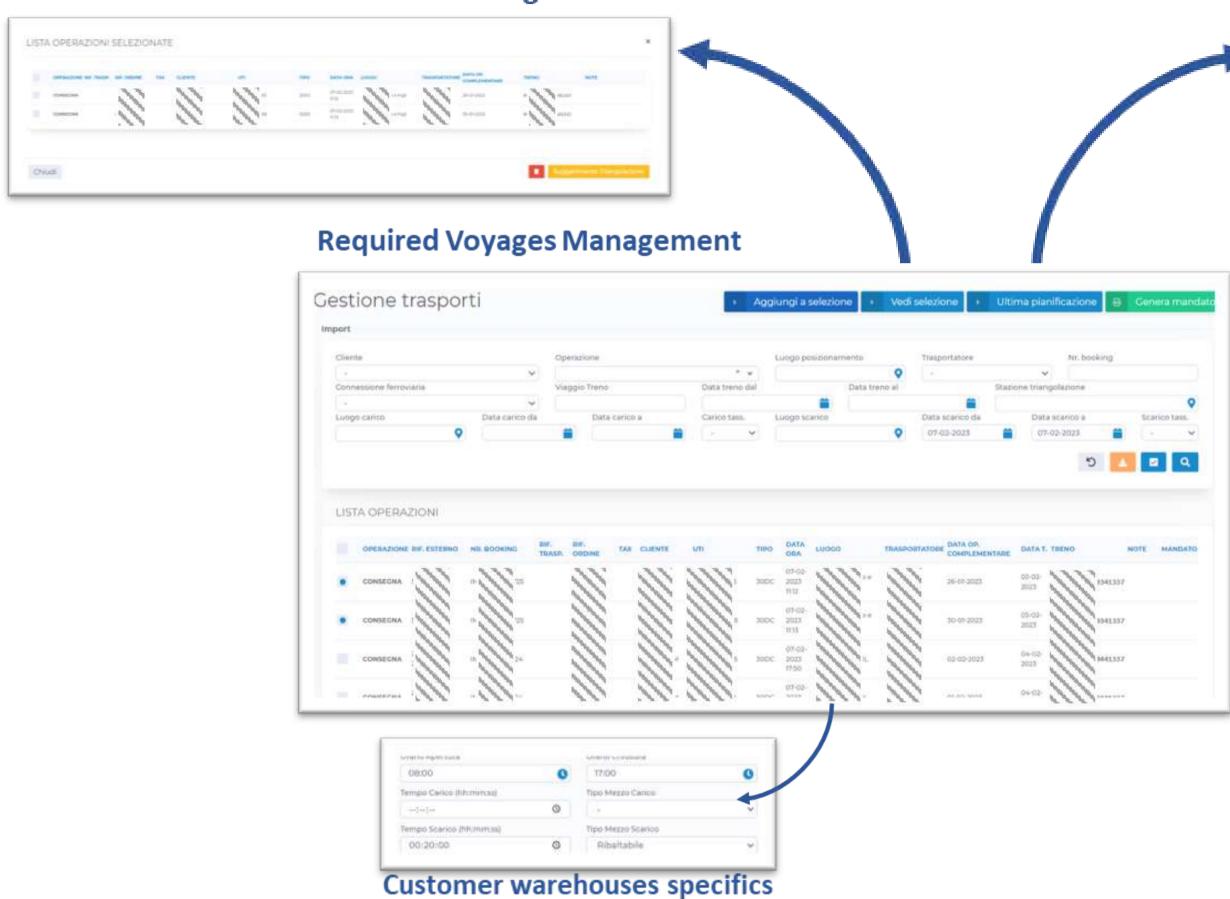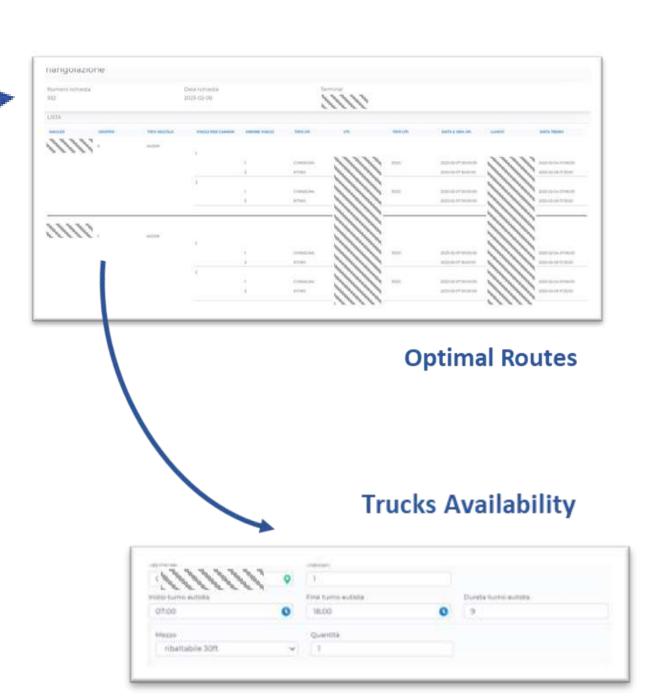
✓ Reduction in costs.

Inland Terminal - Deposit

Client wherehouse

Client wherehouse

MTO PLANNING OPTIMIZATION

Selection management

Required Voyages Management

Optimal Routes

Trucks Availability

Customer warehouses specifics

MARITIME TERMINAL

TERMINAL RAIL CYCLE OPTIMIZATION

Support tool for optimal UTI allocation to wagons, considering structural and stability constraints of the train, along with technical aspects, such as distance as filling percantage, and commercial requirements, including UTI priority.

MULTIPURPOSE TERMINAL SIMULATOR & DIGITAL TWIN

Decision support tools for efficient management of multipurpose terminal operations. This tool provides a real-time representation of activities in multipurpose terminals, allows for effective safety-related events response and enable simulation for operational capacities analysis.
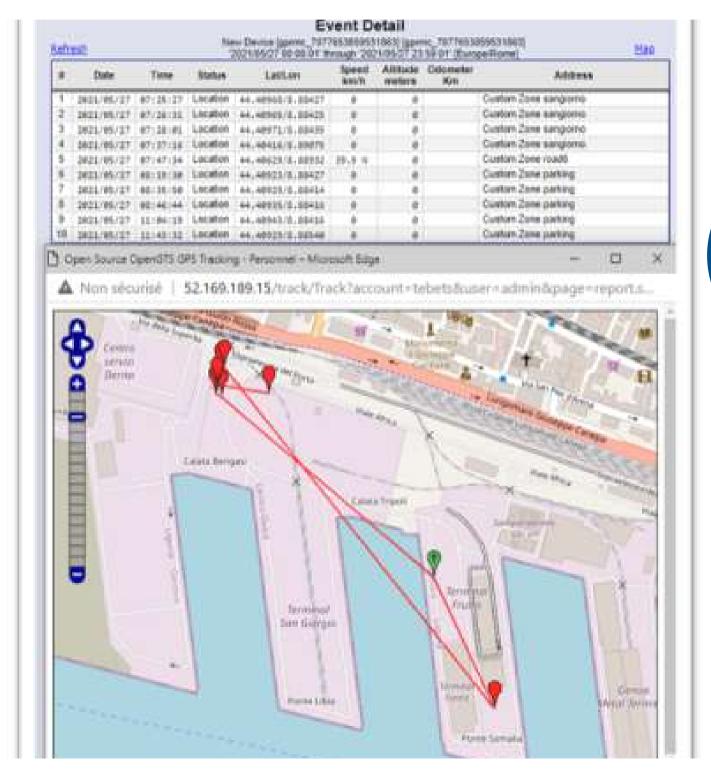
BENEFITS

- OPERATIONS' OPTIMIZATION
- SYSTEM STATUS MONITORING
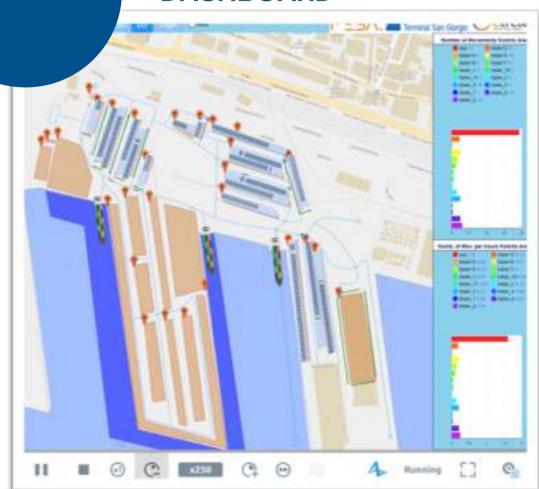- EFFICIENT SAFETY RESPONSE
- SIMULATION
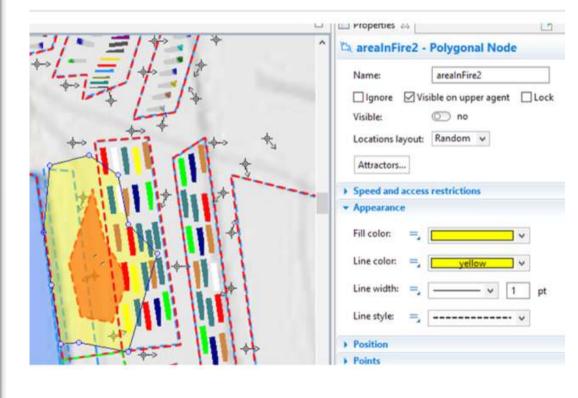- PERFORMANCES ENHANCEMENT

DIGITAL TWIN & OPTIMISATION

PERFORMANCE OPTIMISATION

DASHBOARD

FIRE SIMULATION

TRACKING & ALERT

SHUNTING AREA & RAIL NETWORK

Circle Group

PORT RAIL SHUNTING OPTIMISATION

PORT RAIL SHUNTING SIMULATION & DIGITAL TWIN

A solution designed for railway maneuver managers in the port area, aiming to improve operational efficiency by providing strategic support in maneuver scheduling while considering operational constraints and stakeholder needs.

The developed module facilitates visualizing and managing port railway maneuvers efficiently, offering a detailed virtual representation in a digital environment for monitoring, analysis, and simulation, streamlining understanding, optimization, and implementation of improvements.

BENEFITS

- DECISION SUPPORT SYSTEM & SIMULATIONS
- EFFICIENCY & OPERATIONS' OPTIMIZATION
- PERFORMANCES ENHANCEMENT
- REAL TIME RESCHEDULING
- SYSTEM STATUS MONITORING

PORT RAIL SHUNTING PROBLEMS

SCHEDULING PROBLEM

Scheduling the shunting operations during a planning horizon with respect to the constraints.

RE-SCHEDULING PROBLEM

Rescheduling the shunting operations due to unpredictable events while respecting constraints:

Delay

Change TW of Terminal

Change of operation duration

Suppressed trains

Extraordinary trains

CONSTRAINTS

RESOURCES

- Rail tracks
- Shunting teams
- Engines

TRAIN PATHS

Train arrival/departing schedule previously defined between railway companies and the national railway infrastructure manager

TERMINAL

Preferred time windows for pick-up/delivery of the train from/to the terminal

MINIMIZING

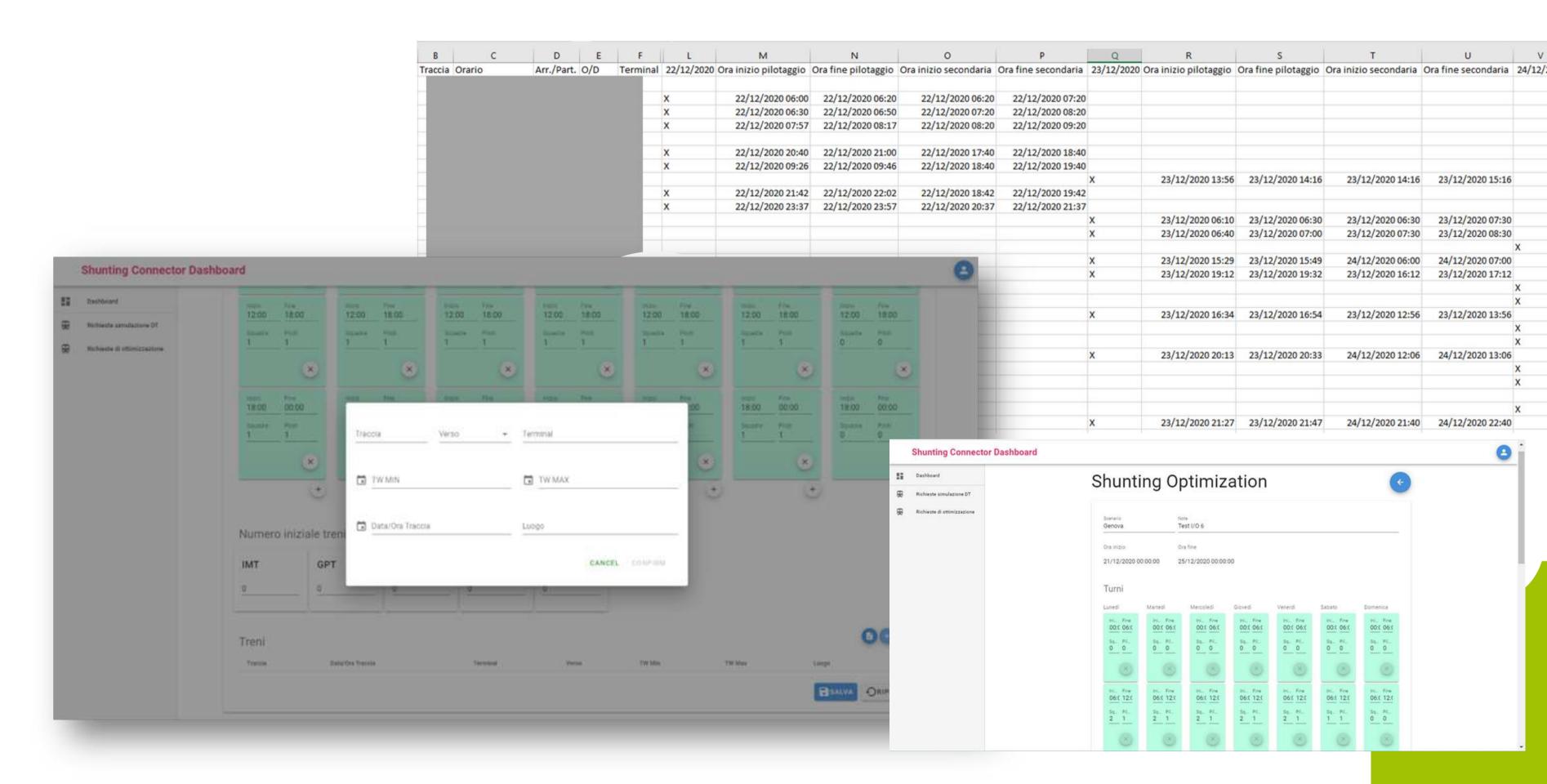the waiting time while performing all the operations

MINIMIZING

the waiting time while keeping, as much as possible, the previously planned timetables for operations

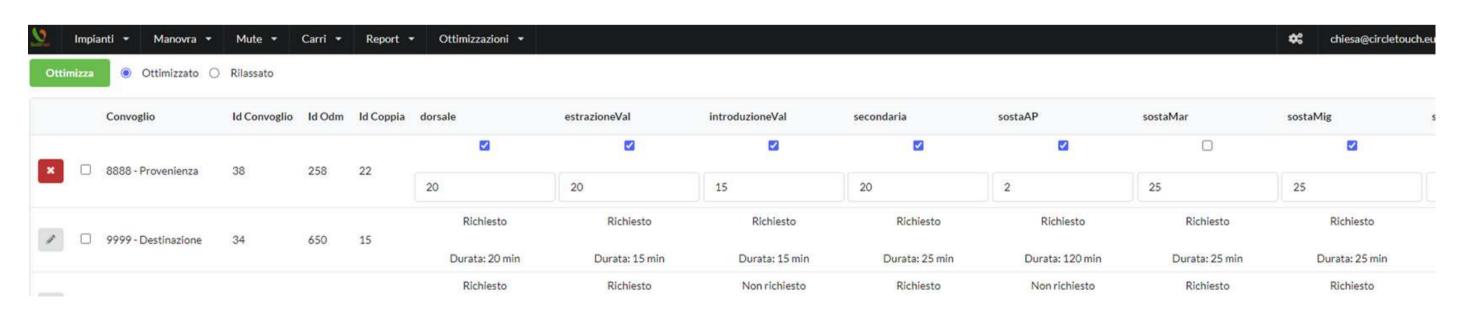# PORT RAIL SHUNTING OPTIMIZATION
SHUNTING CONNECTOR DASHBOARD

PORT RAIL SHUNTING OPTIMIZATION
SOFTWARE TRAINSHUNT INTEGRATION

Optimization TAB

Resource Management

Possibility to manage single requested/not requested operations and related durations
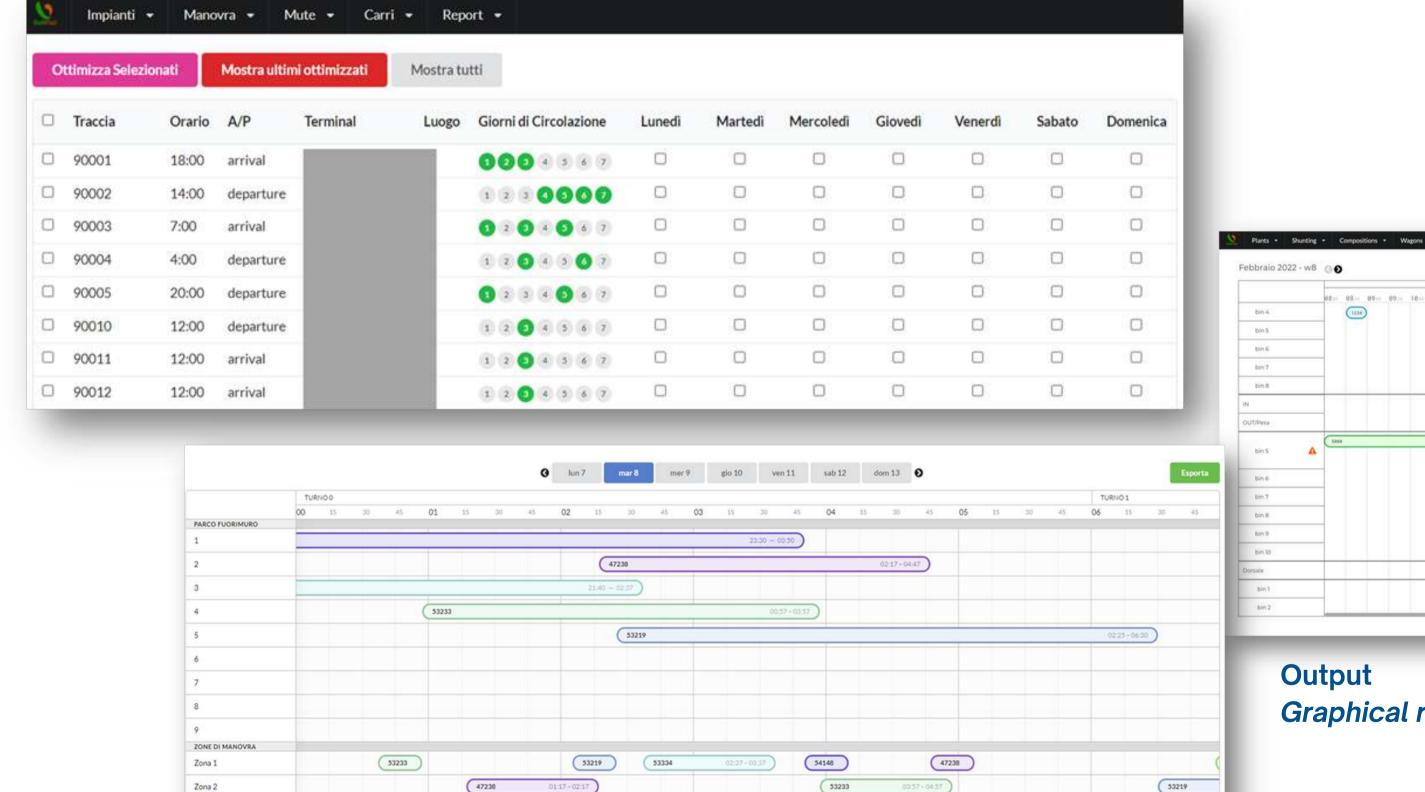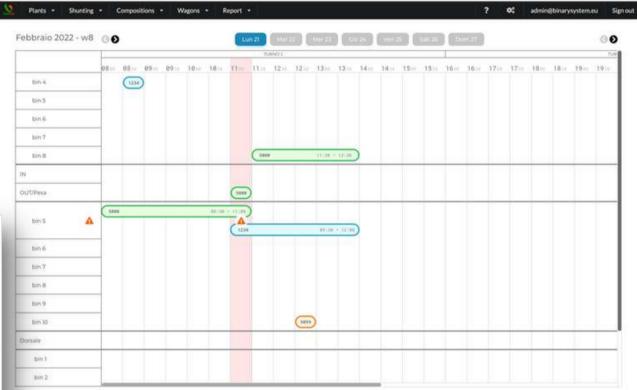
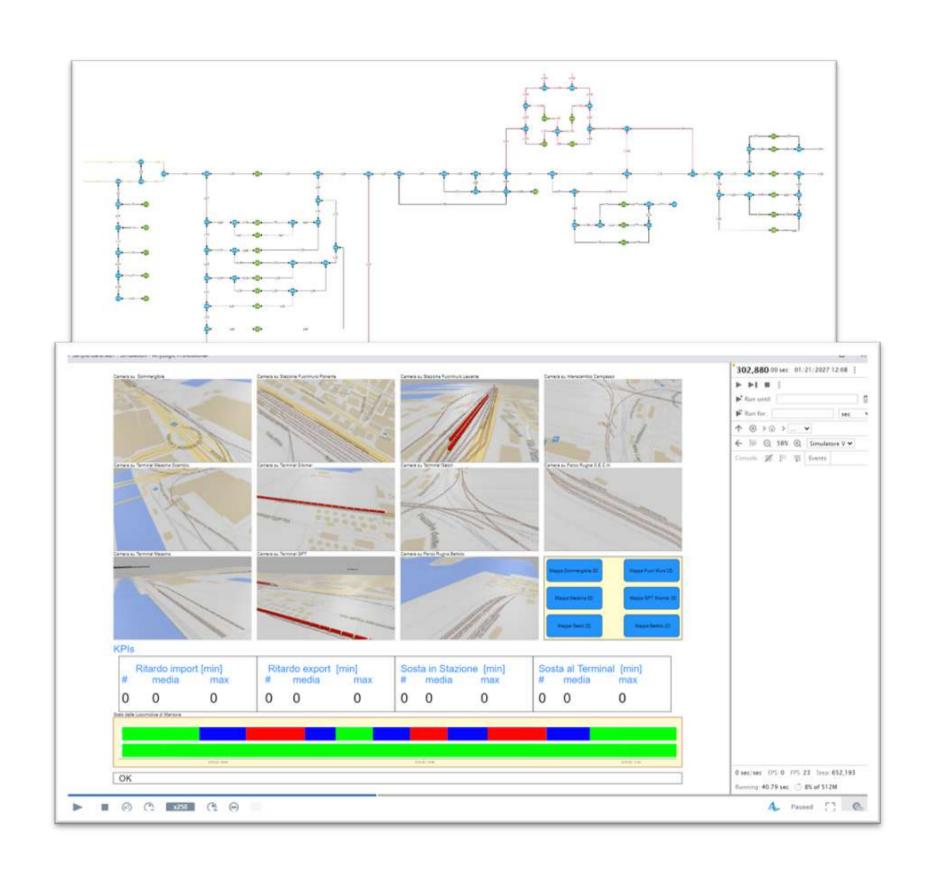# PORT RAIL SHUNTING OPTIMIZATION
SOFTWARE TRAINSHUNT INTEGRATION

Input

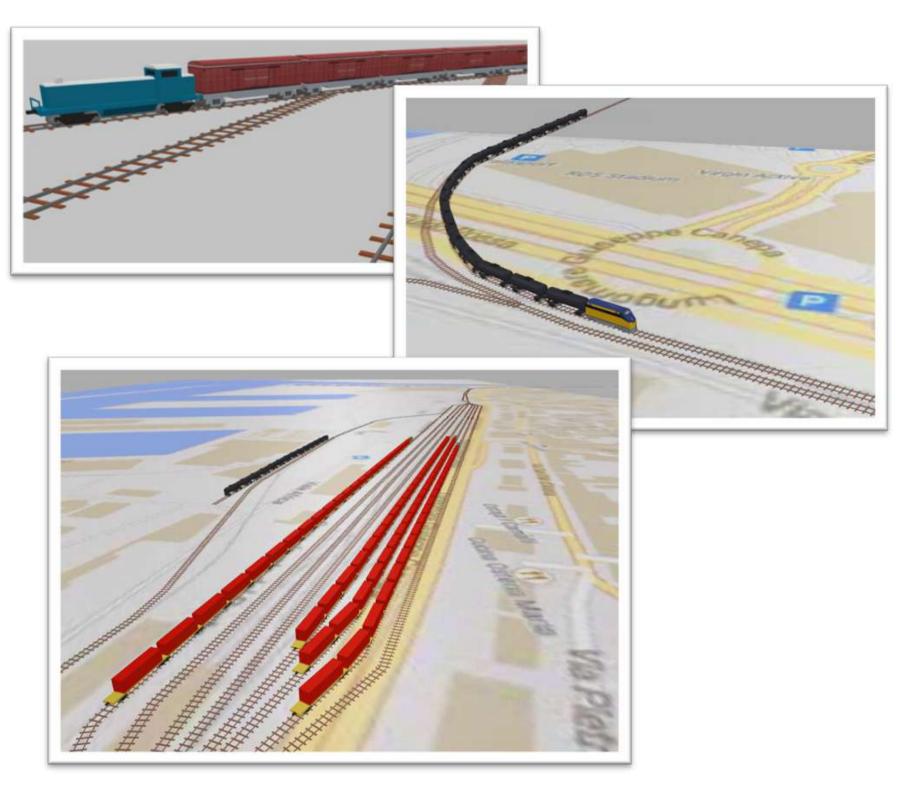**Output**
Graphical representation

SUCCESS CASES

PORT RAIL SHUNTING OPTIMIZATION:
PORT OF GENOA SAMPIERDARENA BASIN

Decision Support System for the optimization and the management of the port rail shunting operations in order to efficiently use the available resources. The system is used for scheduling and re-scheduling the activities when unpredictable events occur.

Integrated with FuoriMuro Information System - Trainshunt of BinarYsystem®

PORT RAIL SHUNTING SIMULATION & DIGITAL TWIN: PORT OF GENOA SAMPIERDARENA BASIN

The digital twin visualizes and monitors infrastructure offering real-time insights into the state of the port rail shunting system. The simulator provides allows analysis of system performance under specific conditions and stress to testing critical aspects and support decision making to enhance operational efficiency and resilience.

Integrated with FuoriMuro Information System - Trainshunt of BinarySystem

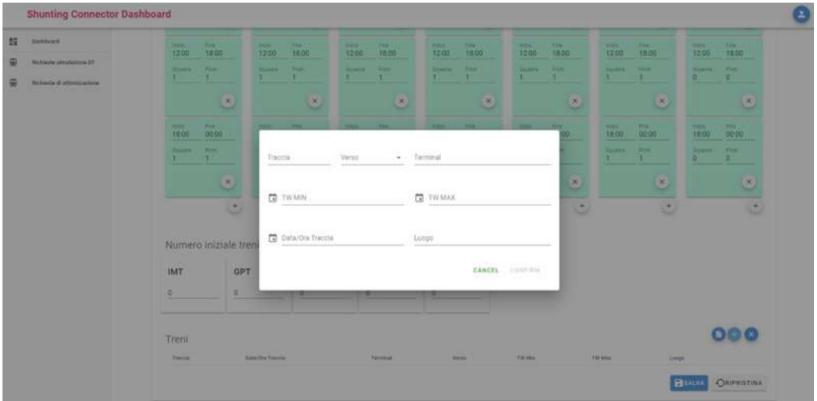# PORT RAIL SHUNTING OPTIMIZATION :
PORT OF LA SPEZIA

Decision Support System for the optimization and the management of the port rail shunting operations in order to efficiently use the available resources. The system is used for scheduling and re-scheduling the activities when unpredictable events occur.

Integrated with FuoriMuro Information System - Trainshunt of BinarYsystem®
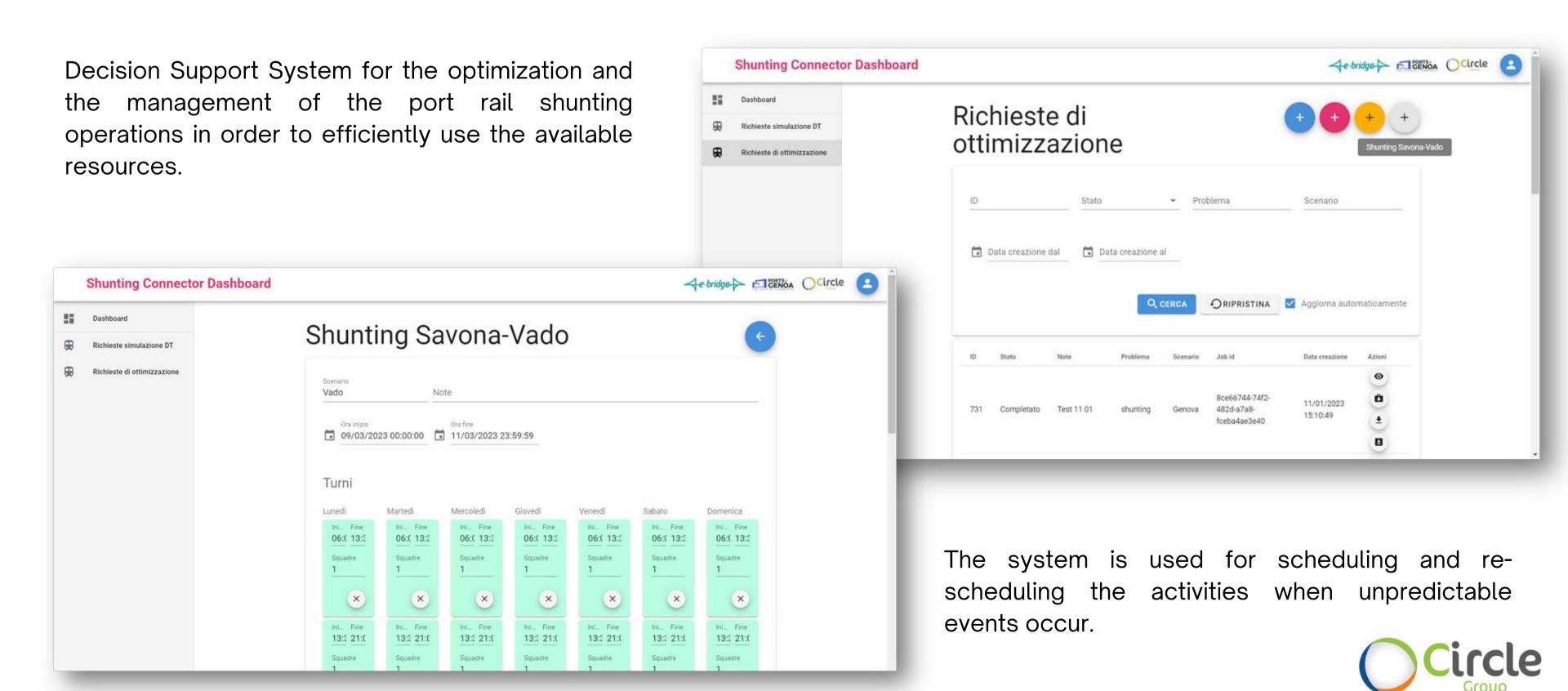
PORT RAIL SHUNTING OPTIMIZATION:
PORT OF VADO LIGURE
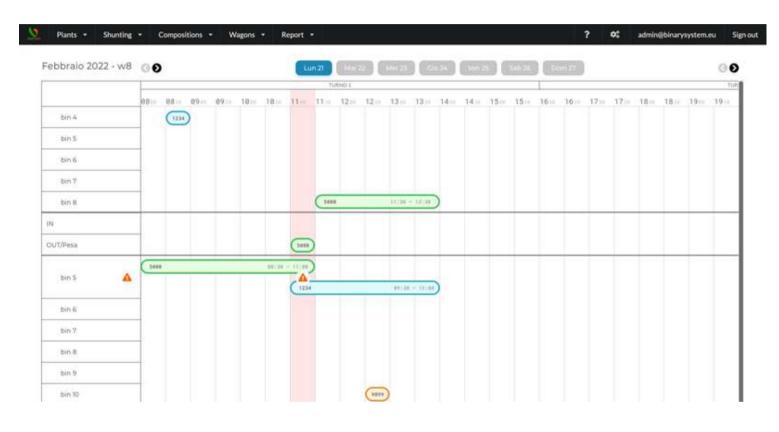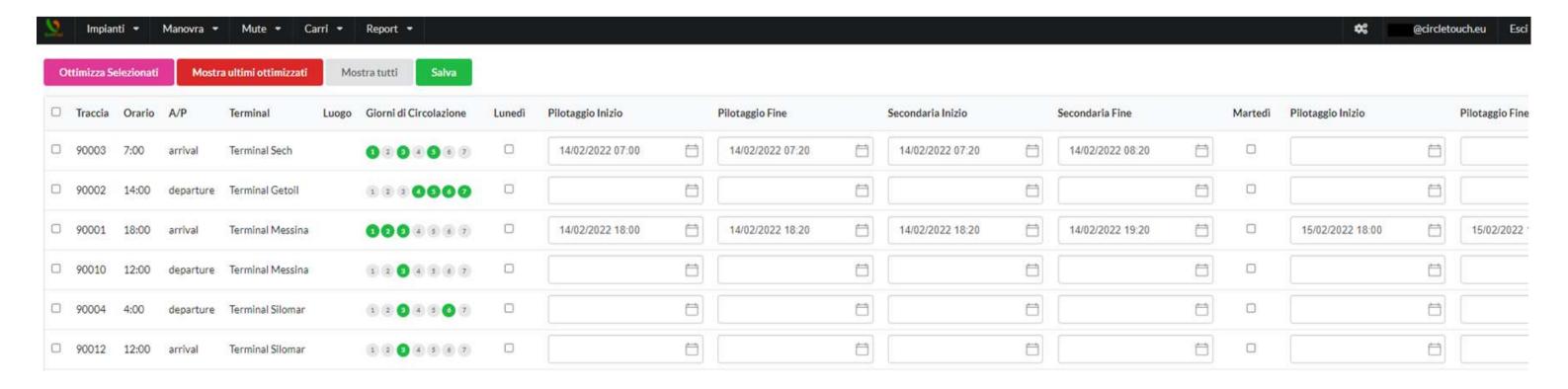
Decision Support System for the optimization and the management of the port rail shunting operations in order to efficiently use the available resources.

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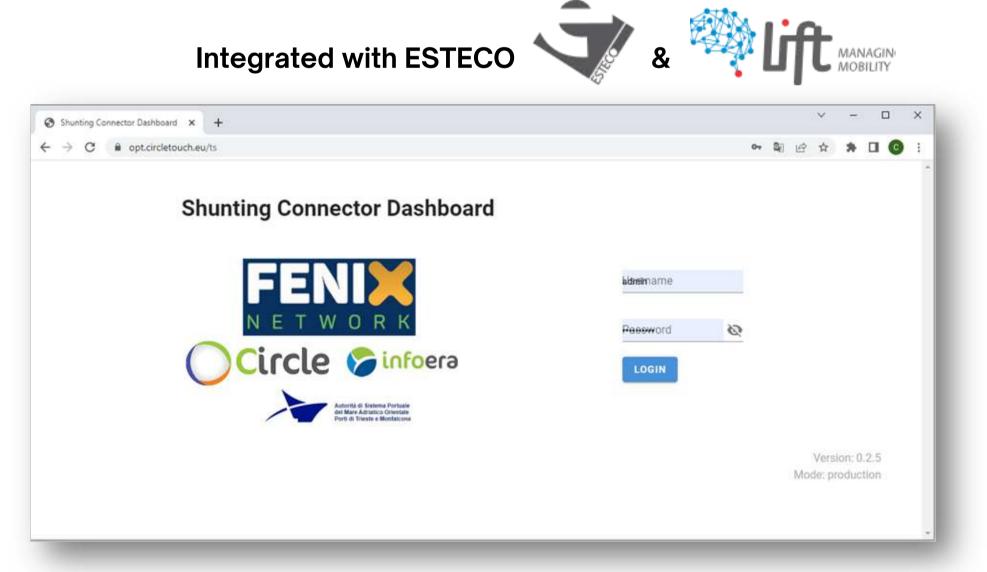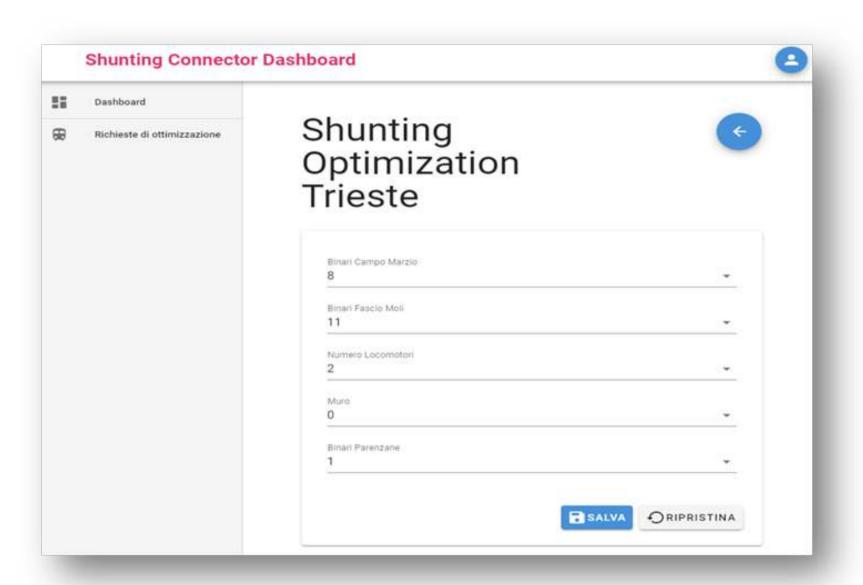
PORT RAIL SHUNTING OPTIMIZATION: PORT OF TRIESTE

The system supports the train circulation management, given that civil works will be operated in order to modernize the infrastructure, in estimating and minimizing the reduction of train circulation.
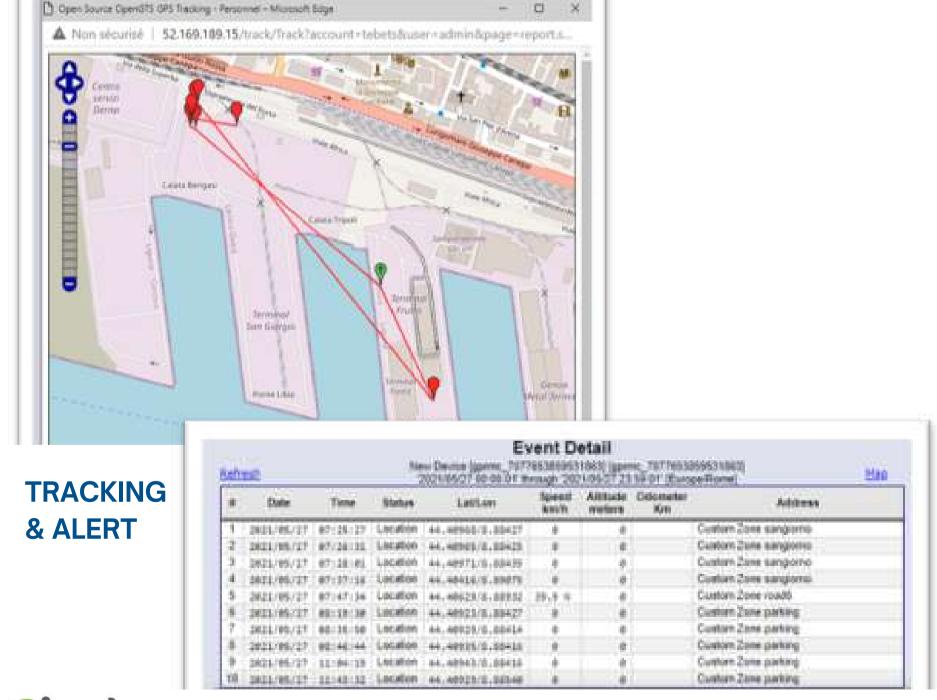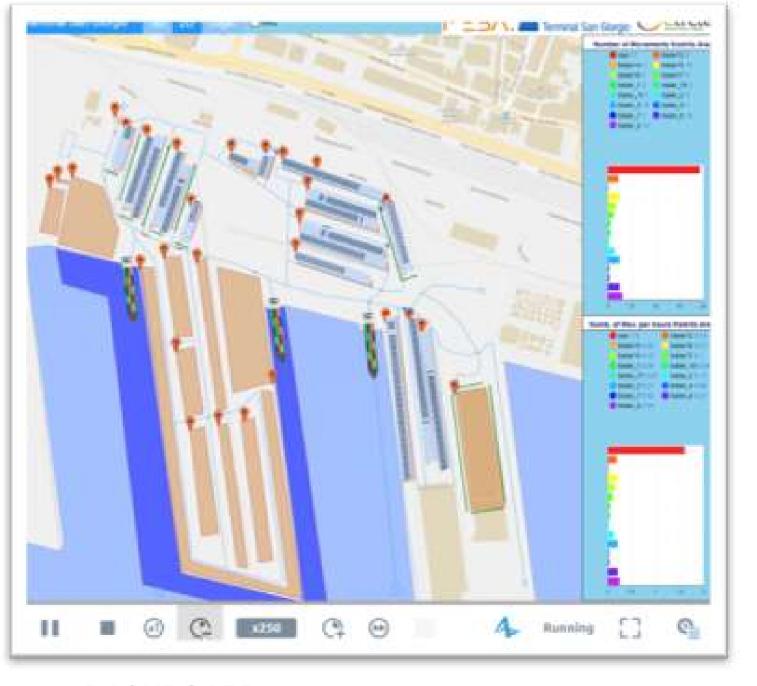
Integrated with ESTECO &

MULTIPURPOSE TERMINAL SIMULATOR & DIGITAL TWIN:
PORT OF GENOA - TERMINAL SAN GIORGIO

Deployment Site Terminal San Giorgio

Decision support tools for efficient management of multipurpose Terminal operations following safety-related events.
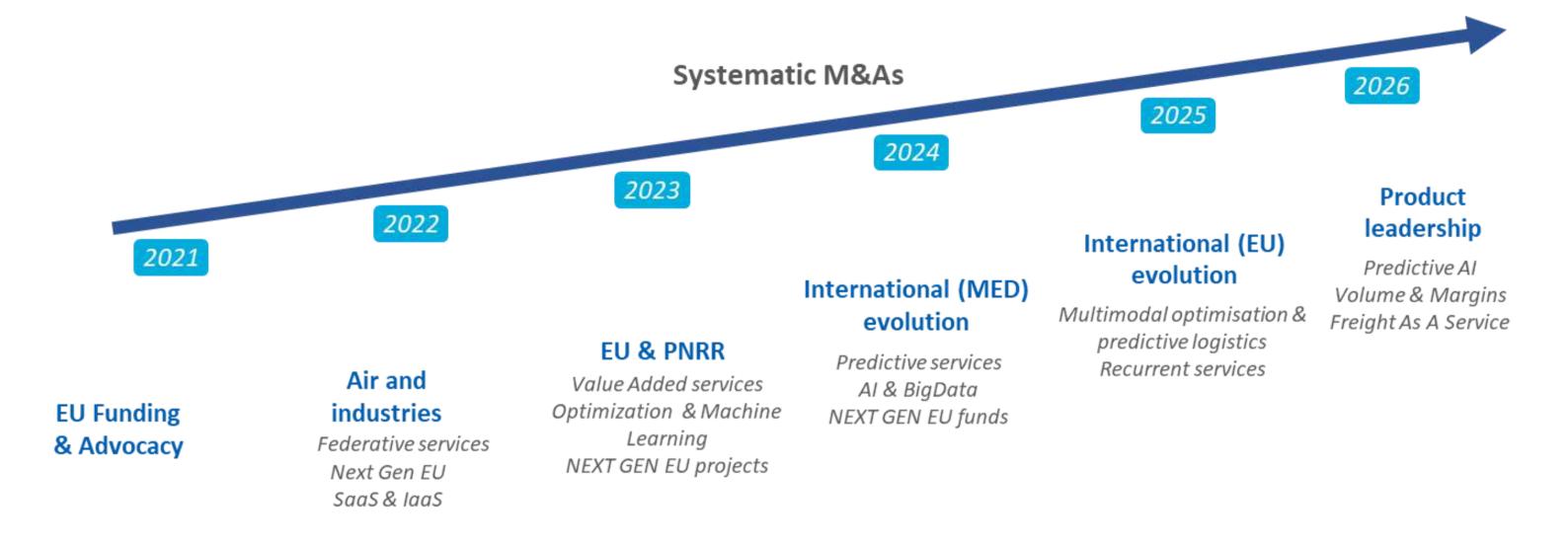

TRACKING & ALERT

DASHBOARD

Circle Group

in collaboration with MESA.

BUSINESS GOALS 2026

Systematic M&As

2021
2022
2023
2024
2025
2026

EU Funding & Advocacy

Air and industries
Federative services
Next Gen EU
SaaS & IaaS

EU & PNRR
Value Added services
Optimization & Machine Learning
NEXT GEN EU projects

International (MED) evolution
Predictive services
AI & BigData
NEXT GEN EU funds

International (EU) evolution
Multimodal optimisation & predictive logistics
Recurrent services

Product leadership
Predictive AI
Volume & Margins
Freight As A Service

Connect 4 Agile Growth

- **Central-South Europe and MED Leader**
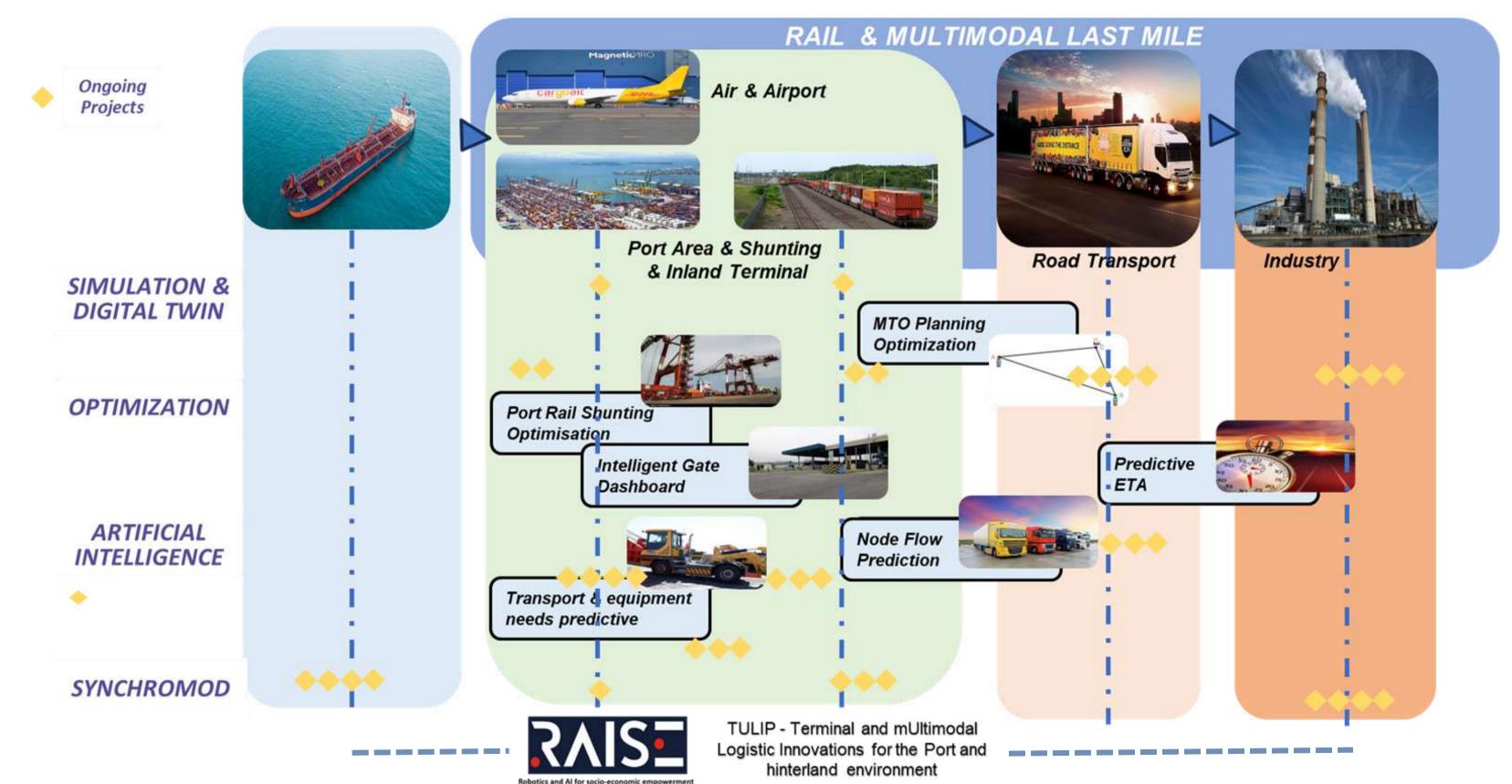- **Predictive & Syncromodal Supply Chain**
- **Anticipated EU and Customs policies**
- **Competitive advantages from federated approach**

5.0 ECO SYSTEM

OPTIMISATION & A.I.

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