BALTIC PORTS AND SHIPPING 2021

TRANSPORT EVENTS

Circle Group

Digitalisation and Optimization of Railway Last Mile operations inside Port areas

Lubeck

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Circle Group,

providing innovative technological solutions for the automation and digitalisation of the entiresupply chain

delivering high value consultancy services supporting maritime, port and logistics actors to gather EU funding and promoting their strategic visibility at international level

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Agenda

Digitalisation and Optimization of Railway Last Mile operations inside Port areas

- Rail Freight scenario in Europe

- Rail Last Mile Management model:

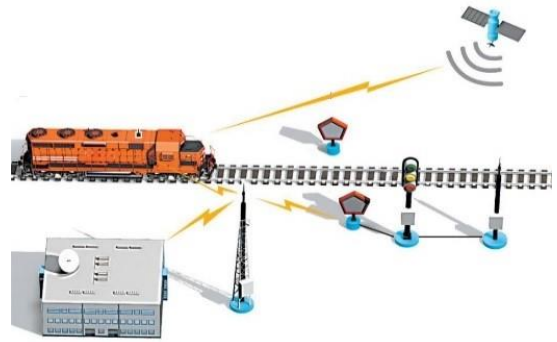
1. Operating needs and solutions
2. Digitalization of Rail Last Mile
   - Federative Digital Platform
   - Terminal Operating System - TOS Rail
   - Optimization & Digital Twin
3. Optimization models

Rail Freight Scenario in Europe

Rail freight transport

Railway transport is the less impactful transport mode for **medium-to-long haul distances**.

Especially, intermodal transport reduces on average CO2 emissions by 55% compared to road transport.



Benefits of railway transport:

- ✓ **Faster transit times**
- ✓ **Reliability** and **efficiency** with GPS tracking and IoT
- ✓ Convenience and **cost-effectiveness**
  - ➢ Shippers can save 10-40% for long-haul freight from road to rail (also due to lower fuel costs)
- ✓ Higher level of **transport safety & reliability**
  - ➢ Standardized transit schedules
- ✓ Reduced **road congestion**
- ✓ **Ecofriendly** due to a lower level of CO2 emissions
  - ➢ Example: with a load of 100 tons on a journey from Modena (Italy) to Moscow (Russia) (about 2,500 km) the train emits up to 75% less CO2 than the truck
- ✓ Allows to move **large quantities** of goods over medium-long distances
  - ➢ One double-stacked train can hold approximately the same amount as 280 trucks

EU policies & Projects related to Railway transport

CEF2: 2021-2027

The second edition of Connecting Europe Facility (CEF) will fund major transport, digital and energy projects that run from 2021 to 2027. With an overall budget of about €30 billion, CEF will focus on projects that seeks to modernise transport infrastructure or promote cross-border links

European Commission has already implemented a number of actions:

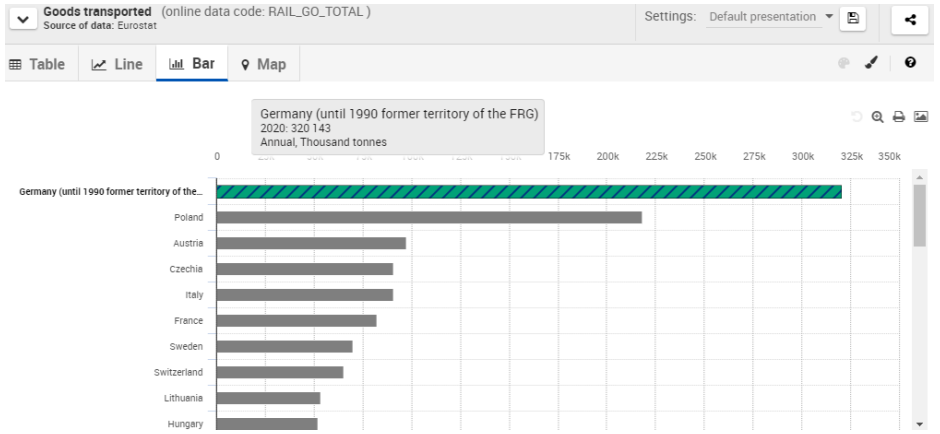
- 2016's Fourth Railway Package (begins full implementation in 2021)
- Single European Railway Area
- Shift2Rail Joint Untertaking: the most sustainable, cost-efficient, high-performing, time driven, digital and competitive customer-centred transport mode for Europe
- 2021: European Year of Rail Transport

Enhancing rail interoperability with TAF TSI standards

EU Rail freight transport statistics

Transport Modes share, European Union

Railway Transport: Annual Thousand Tonnes

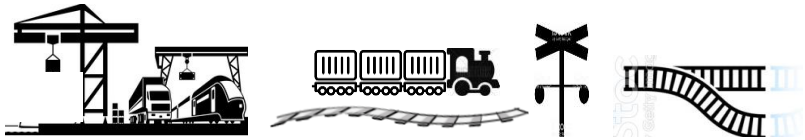


Railway Mode share's **growth expectation** in the next years

Rail Last Mile Management model

Rail Last Mile Management: objectives and purposes

What is Rail Last Mile?



"it is the railway section between the last railway station and the Port or Inland Terminal of destination / departure of the goods"

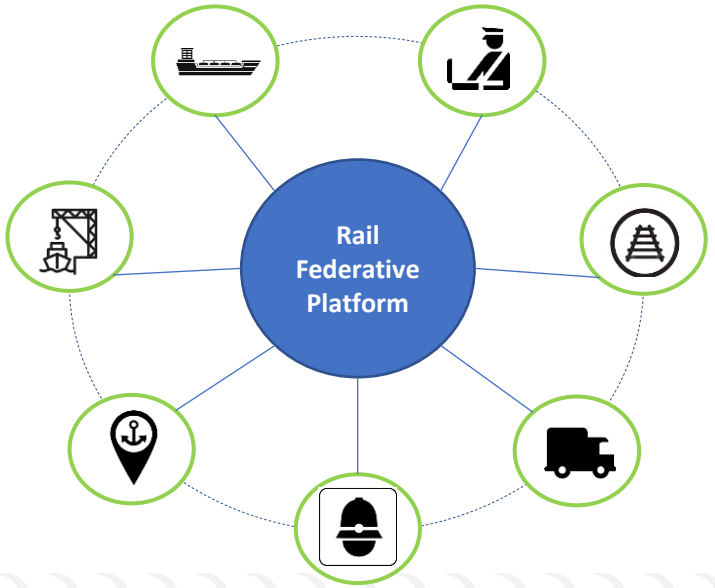
Rail Last Mile Management

- Digitalization of information flows between the actors of the Last Mile
- Optimization & digital twin
- Upgrading of network infrastructures
- Operational Processes

Increase the connections of the railway network with ports, Inland Ports, terminals and logistics platforms and develop functional and reliable intermodal services, in order to generate a structural benefit for the logistics system

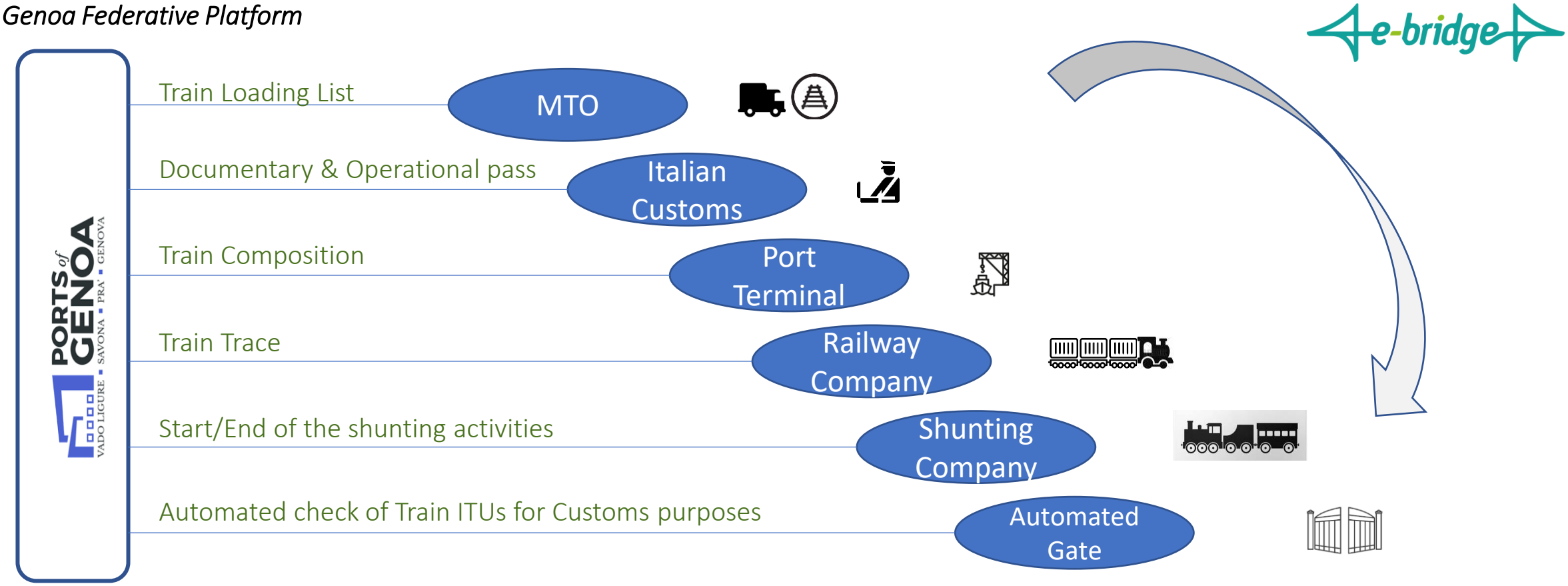
Rail Last Mile Management Platform

Federative digital platform able to interconnect all the actors involved in the processes of the Rail first and last mile



Rail Last Mile Management Platform: Ports of Genoa

Ports of Genoa Federative Platform



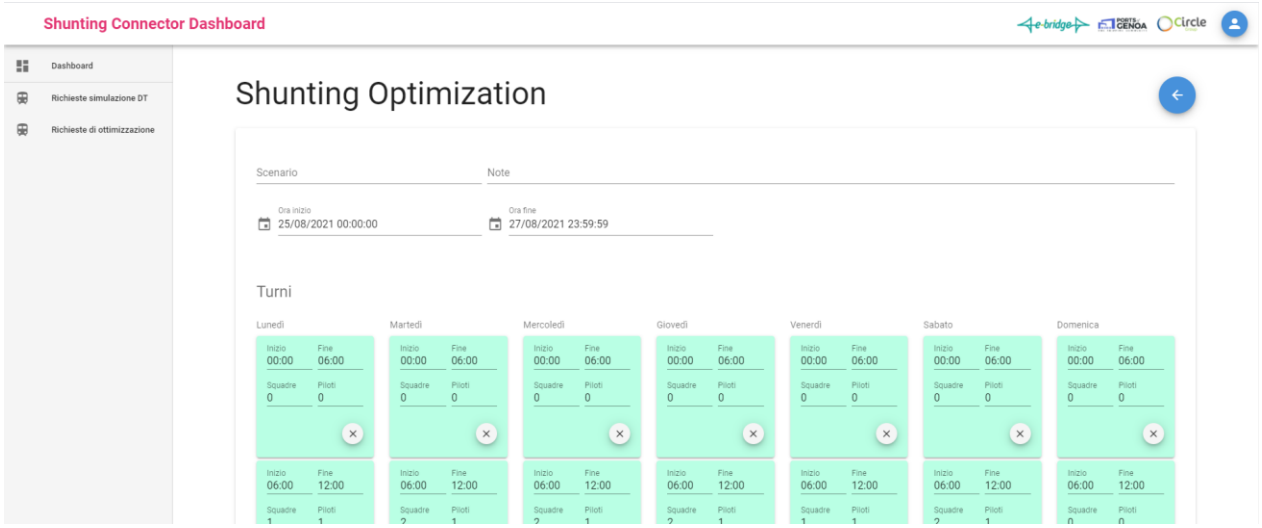
- Digitalization of information flows between the actors of the Last Mile
- Value Added Services related to operational processes
- Railway transport mode share's increase inside Port Area

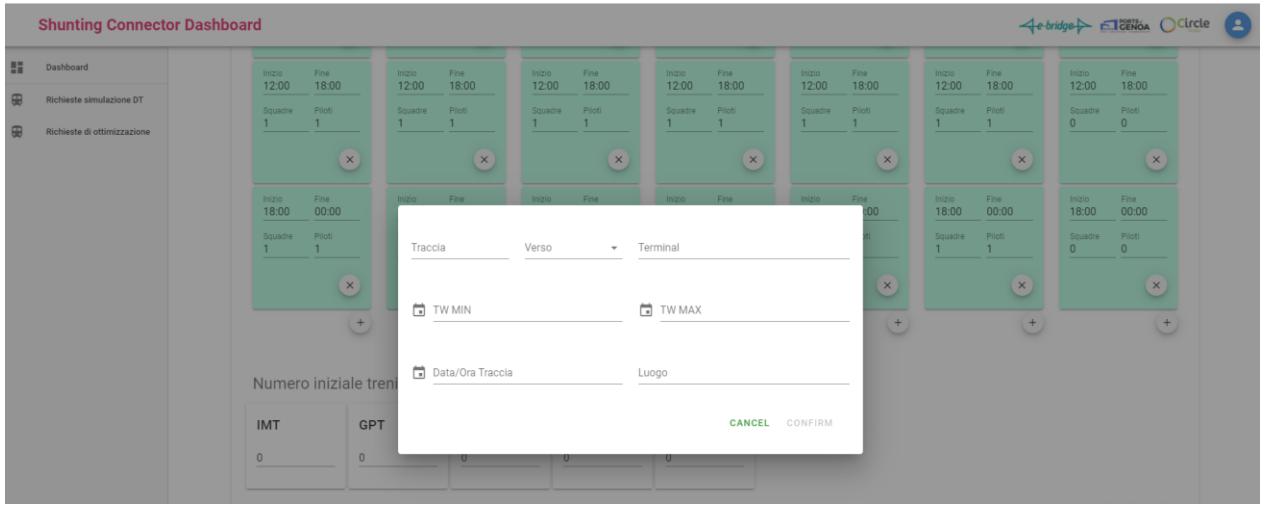
Optimization & Digital Twin

Port Rail Shunting Optimization

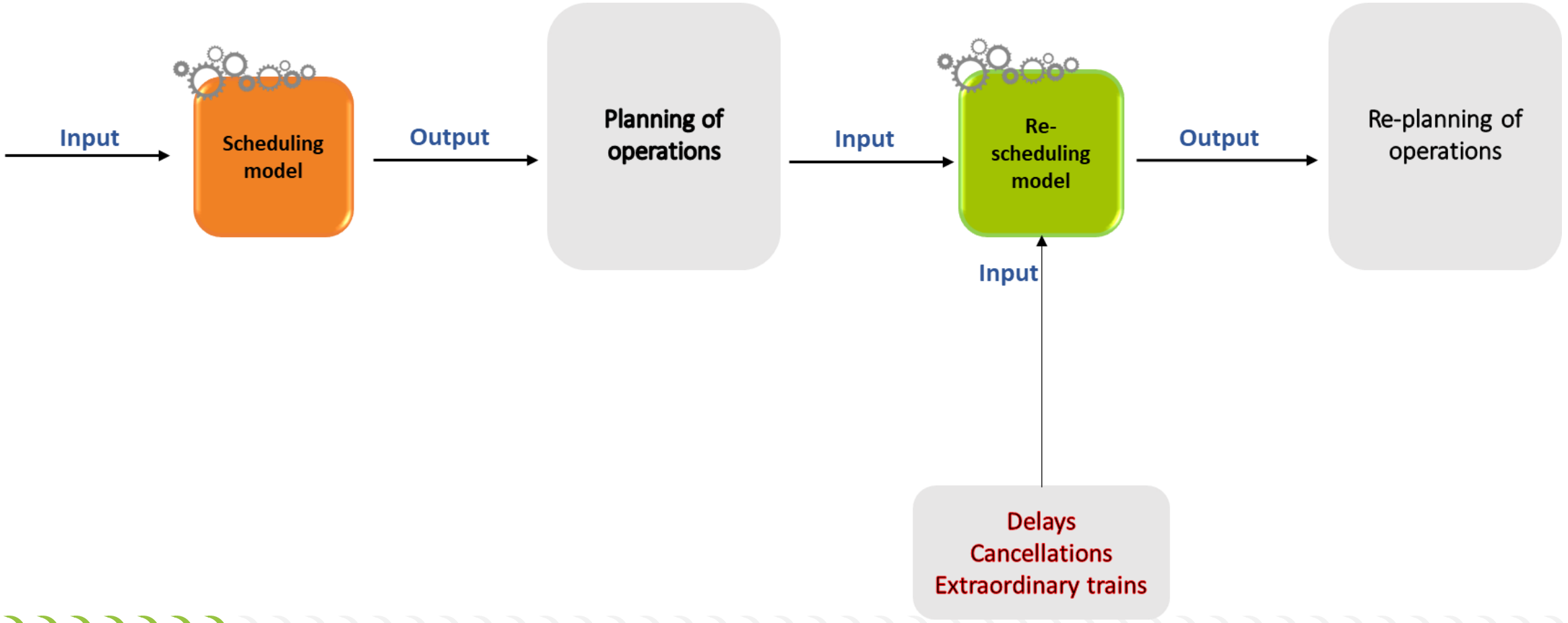
Tool for supporting planning of railway shunting operations inside port areas

- **Scheduling** the shunting operations with respect to the constraints arising from resources, trains' paths and terminal availability
- **Re-scheduling** the shunting operations due to unpredictable events with respect to the constraints

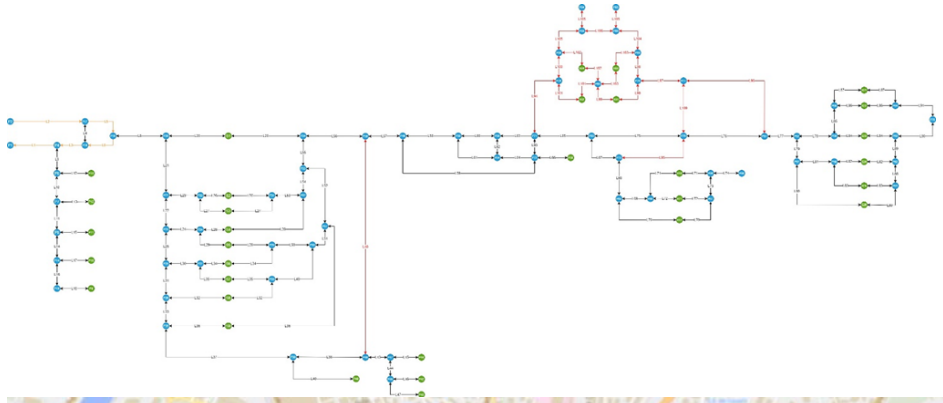




PORT RAIL SHUNTING OPTIMIZATION PROCESS



Optimization & Digital Twin



Port Rail Shunting Process Digital Twin

Digital Twin for both the visualization and the simulation of railroad maneuvers using simulation through AnyLogic software

Concrete proposal

Within the next few months the ***digitalisation and optimisation of rail last mile transport operations and documents*** are further used and tested in ongoing **EU projects** and also in new **CEF2 proposals**

More than 28 international actors of the Rail Transport industry have already signed an Expression of Interest

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visit us @ our stand 29

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