



Intermodal services for routing and network optimization to enable modal shift in simulation, collaboration and operational scenarios

04th July 2024, web-conference

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FALC / Fully Automated Logistics Center – picture: @shutterstock | Chesky



Source: Ansys: https://www.ansys.com/de-de/blog/self-driving-trucks







Disruption categories

Transport delays

Natural disasters

Information distortion, delay, or breach

Economic fluctuations affecting prices

Worker skills, strikes, and shortages Infrastructure breakdowns due to insufficient maintenance

Technological disruptions

Policies and processes

Acts of war, terrorism, political instability

Cultural differences

Diseases/ pandemics Unreliable energy sources



Source: VDI Foto: imago images/Eibner/Jörg Niebergall







During the operation phase challenges appear

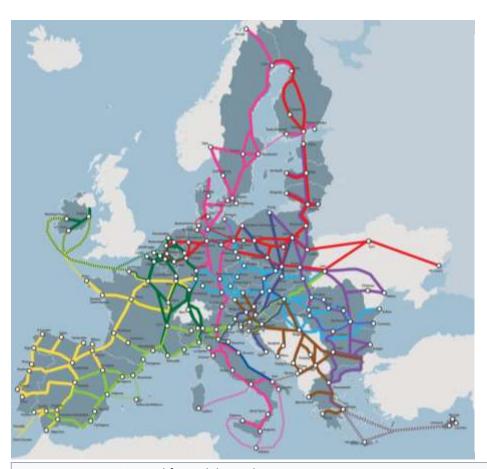


- The traffic situation of one or more networks changes
- Network disruptions appear
- A vehicle breaks down, a driver is sick
- Planned time windows can`t be fulfilled
- Services can`t be performed within planned time
- Mode specific delays
- Train, barge, ferry is
- Delayed, cancelled
- Journey sequence changed
- Truck is stuck in traffic, driver can`t continue due to break restrictions
- And even more madness ...



ReMuNet Pioneering resilient and adaptive multimodal transport networks

ReMuNet corridors





Source: Directorate-General for Mobility and Transport, European Commission





Focus - Strategic Phase

Motivated by the Physical Internet concept

- Identification and clustering of potential modal shift shipment categories
- Identification of relevant transport networks (modes, hubs, operators, services, capacities).
- Analyze As-Is scenario and potential future scenarios.
 - Transport demand
 - Services and costs
- Generation of critical mass for modal shift towards green modes if possible,
 - Collaboration between shippers, logistical nodes and lane managers (inside and across companies)
- Harmonization of data and process interplay.
- > Phase result: A strategic plan on the transport network layout.
 - > What are the main nodes?
 - > What are the main lanes?
 - > What is to be transported intermodal, and what to be trucked?

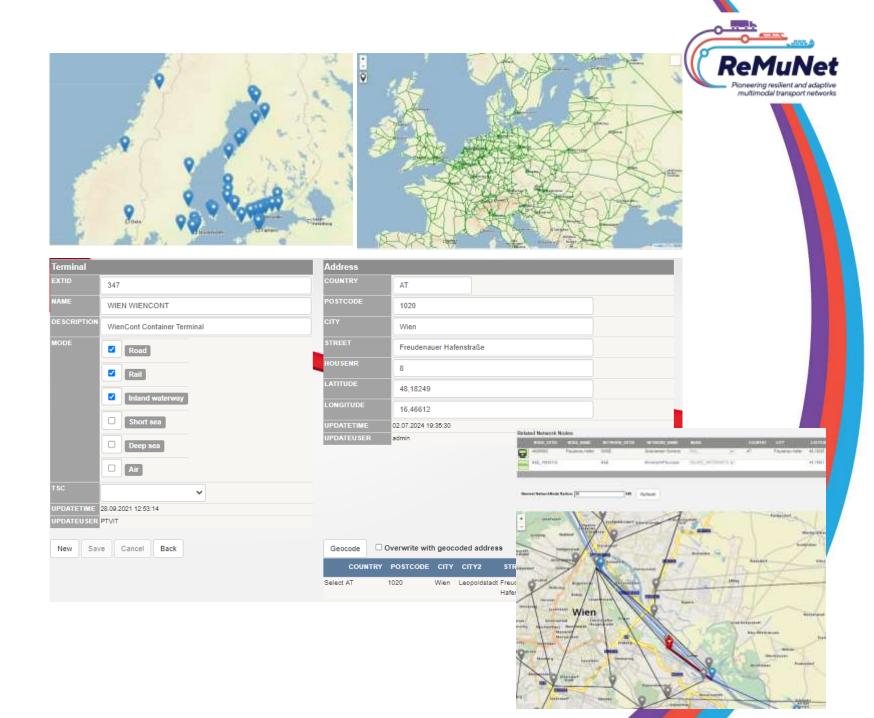




Digital data support -Infrastructure

- Logistics nodes
 - Terminals
 - Hubs
- Networks
 - Road
 - Relay Transport
 - Rail
 - Inland wather way
 - Sea
 - Air

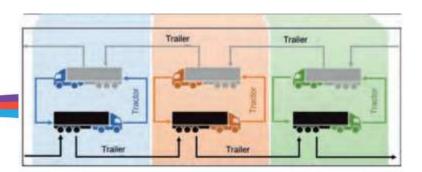
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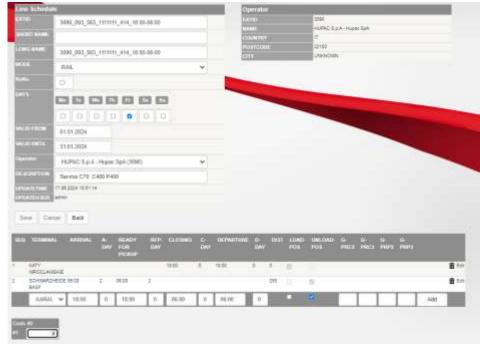


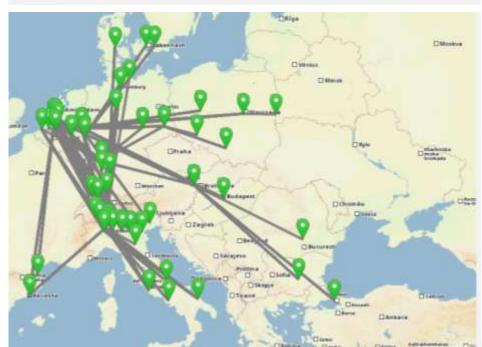


Digital data support - Services

- Intermodal timetables
 - Lanes
 - Frequencies
 - Service days
 - Times
 - Costs
 - Restrictions
- Operators
 - Name
 - Contact













Tools for planning and optimization

Based on regular services of multiple modes of transport such as rail, barge, air, road, sea ReMuNet provides possible intermodal door-to-door routes, in general with a road leg at the beginning and at the end.

While aiming for "optimized" door-to-door chains in order to support efficiency and decarbonisation of transports, the challenge is to provide meaningful and optimized solutions already at the stage of the initial chain composition. To achieve this task, constraints and performance indicators have to be respected and assessed.







Tools for planning and optimization

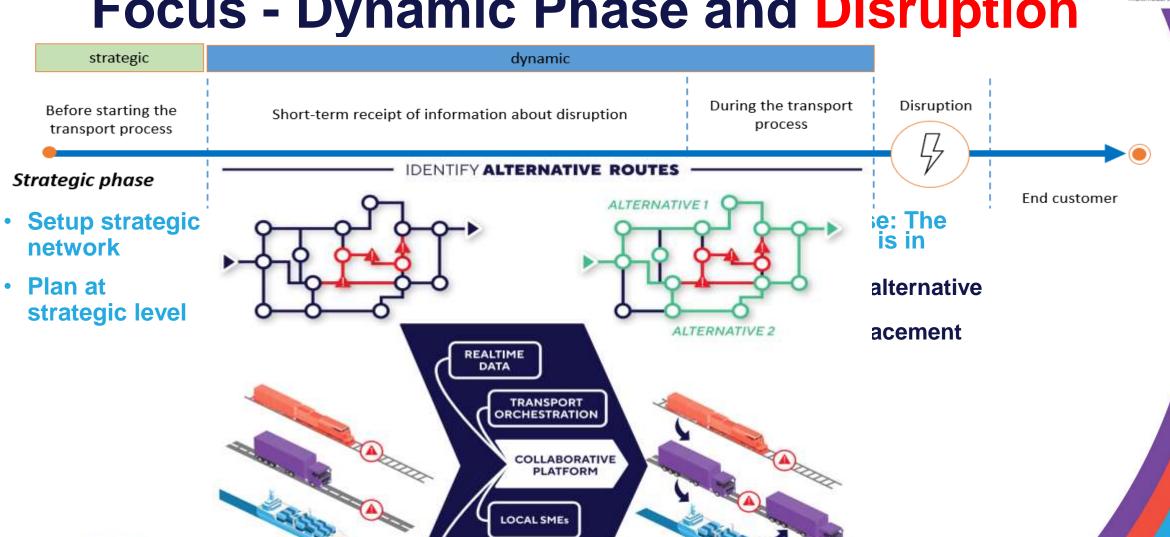
- Provides a suggestion, how the orders should be transported in an optimal way based on the given resources and costs.
- This includes the decision on mode selection (whether planning should be done intermodal or by road only)
- If intermodal:
 - the transport chain is based on one or more transport modes
 - the concrete voyages per transport leg
 - the capacity reservation instruction per voyage
- If trucking: direct trucking or relay transport



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Focus - Dynamic Phase and Disruption



CAPACITY ALLOCATION

Disruptive Event





Summary

Strategic level

- Information on transport networks is a key enabler
- Strategic decision how to transport modally and with which networks
- IT tools can support planning and optimization at large. However, the decision for collaboration is often not done by IT, but by company management

Tactical & operational level

- Disruptions occur across all networks. The impact of the disruption often variates.
- A transportation desk, managing the transport has several option to react to disruptions.
- IT tools can support analysis of disruption impact and support potential alternative transport options





Thank you for your attention Questions?

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