4th ALICE logistics innovation award
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Cloud report “Logistics Networks”

HACON

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Activities performed in the frame of the project BOOSTLOG “*Boosting impact generation from research and innovation on integrated freight transport and Logistics system*”. BOOSTLOG has received funding from the European Union´s Horizon 2020 research and innovation Programme under grant No 101006902.

Scope definition – What are Logistics Networks?

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Our understanding in relation to cloud report:

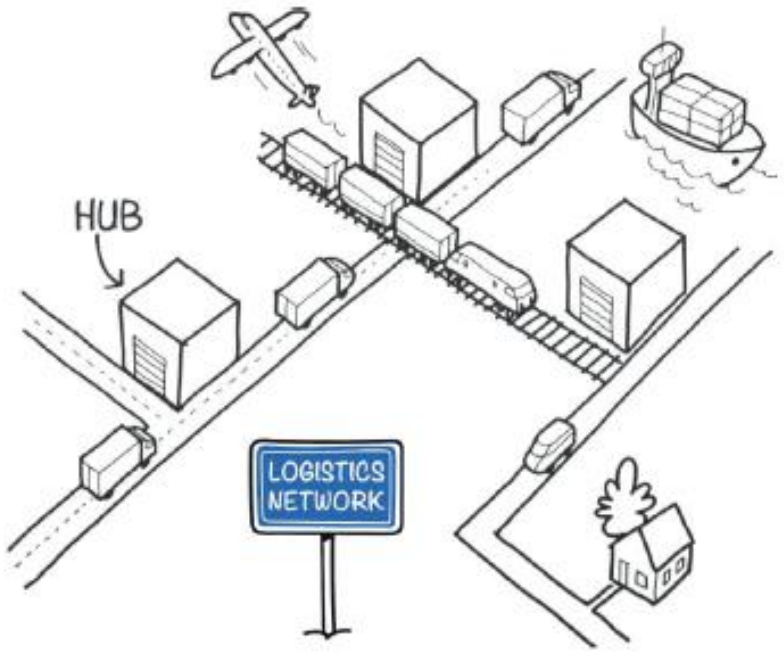
Logistics networks
→ Multimodal freight transport corridors or networks

3 Levels:

(1) Network infrastructure, interfaces

(2) Transport services

(3) Supply chain / Logistics services



Source: ALICE, Physical Internet Roadmap

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Why improving Logistics Networks?

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Capable Logistics Networks are the backbone for the economic development of countries and regions!

Logistics Networks ensure trade flows, linking transport modes and connecting long haul transport with regional/urban distribution. Their importance relates to all three levels of Logistics Networks:

(1) Well developed corridor and network infrastructure sets the basis for Europe-wide freight transport
→ TEN-T, Rail Freight Corridors

(2) Modal-shift depends on market-oriented transport systems
→ Focus on Rail, IWW

(3) Capable Logistics systems ensure well functioning of international supply chains
→ Multimodality, Synchromodality

but logistics framework conditions are changing due to global crises and economic trends.

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Intervention areas and expected impacts

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Intervention areas

(1) Intermodality (Multi-modality, Synchromodality)

(2) Operations and processes

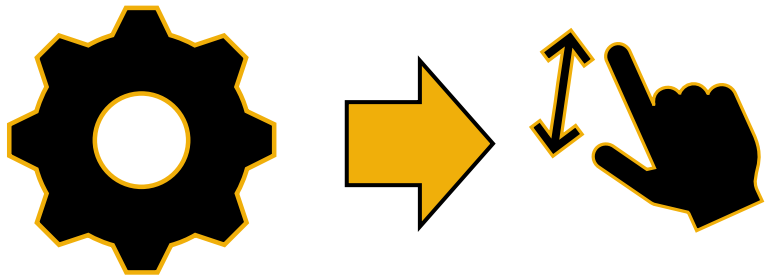
(3) Digitalisation

(4) Transport management; Transport service planning and controlling

(5) Network capacity management (TCR, train path allocation…)

(6) Contingency management

(7) Last mile (operation processes, propulsion concepts and technologies)



Impacts

- Decreased environmental impact; Improved energy consumption
- Reduction of congestion on the road network
- Modal shift
- Improved capacity utilisation of barge, train and truck
- Decreased cost of transport & overall logistics
- Increased transport efficiency
- Increased transport reliability and responsiveness
- Decreased travel times
- Improved performance of the European Transport
- Improved long distance-city distribution connectivity

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Barriers/guidelines to achieve benefits of Logistics Networks

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Barriers due to …

(1) Climate change risks	e.g. disruptions to service operations, Threats to assets and infrastructure (due to extreme weather events, rising sea water levels,…
(2) Diversity and/or insufficient level of infrastructural and technical standards	e.g. in relation to TEN-T standards (ERTMS, 740m train length, IWW navigability,…)
(3) Socio-economic developments	e.g. energy scarcity, deindustrialisation / disrupted supply chains, citizens resistance against infrastructure projects
(4) Increasing operational problems	e.g. decreasing capacity of networks and corridors due to incresing traffic and construction works, lack of qualified operational staff, disrupted transport chains (e.g. in IWW due to low water levels)

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Cloud report – methodology

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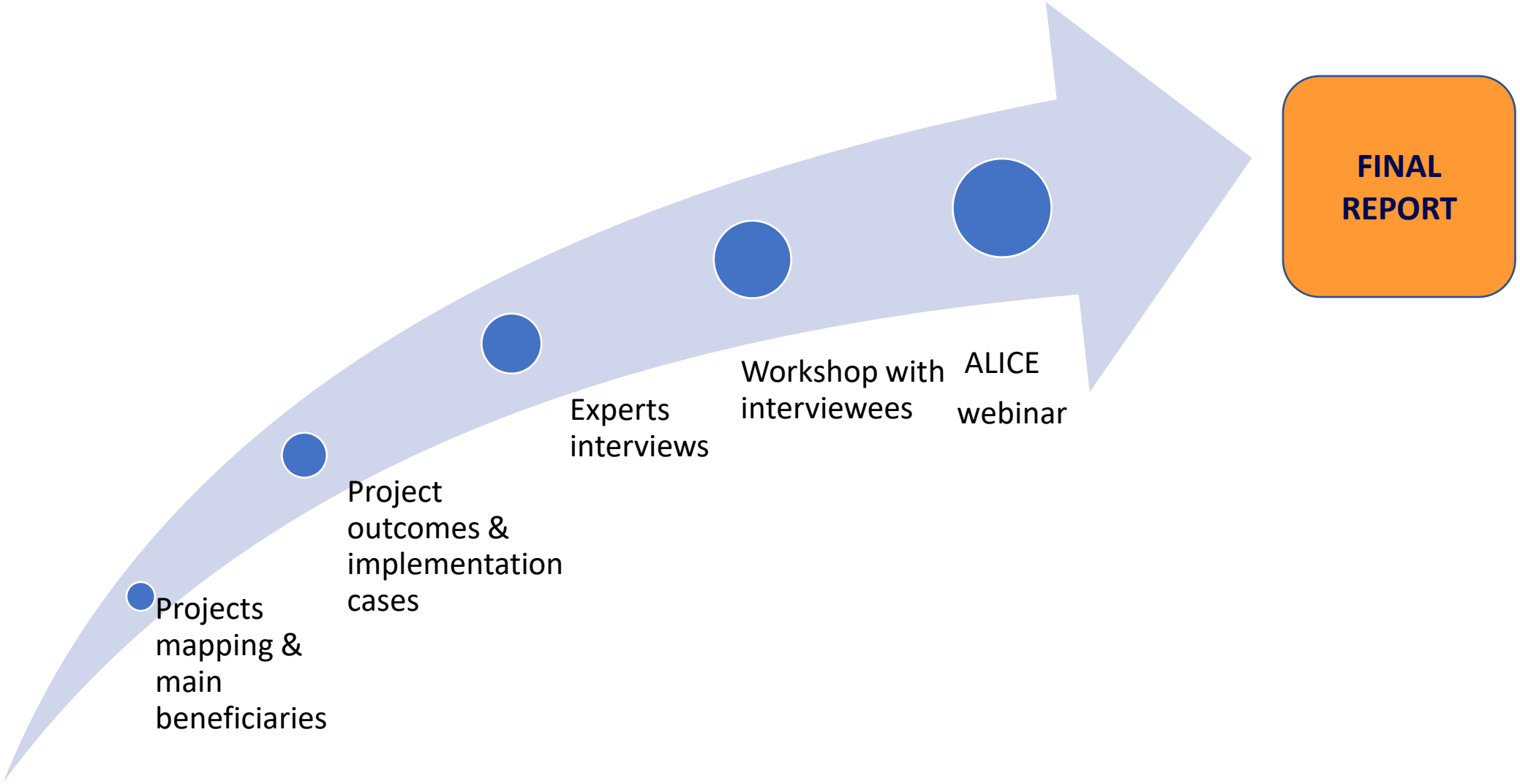

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Project mapping & filtering

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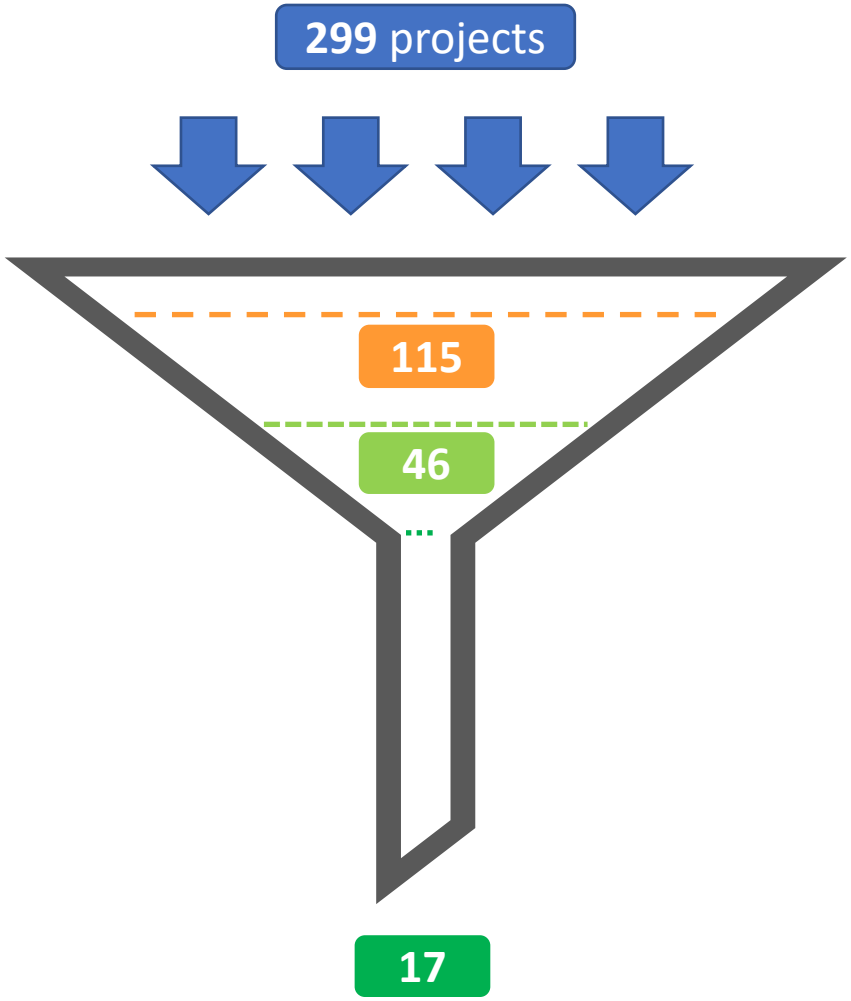
Filtering results



1st Filtering by
- project name and
- primary mapping parameters

2nd Filtering by relevance „High“

3rd Filtering by
- Compliance with main intervention areas of logistics networks,
- Expected impacts,
- Overlapping with other Cloud Reports

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Selected projects (overview)

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Total: 17 projects

INTER-FACE

GIFTS

NEWS

Synchro-NET

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Project outcomes and implementation cases

Based on Desktop research + interviews

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Retrack Network (FP6, RETRACK)

Train Monitor (FP6, CREAM)

Multimodal short sea rail transport concept (FP6, CREAM)

Intermodal Network 2015+ (FP7, TIGER DEMO)

Cross-border Dispatcher (H2020, SMART-RAIL)

17 projects

- (1) Implementation cases
- (2) Demonstration and/or temorary implementation
- (3) No implementation

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Imlementation challenges and success factors

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Analysed projects projects achieved **several outcomes with numerous successful test and demo implementations** during the project lifetime…

…but continued and **regular use of outcomes in real life environment after the project is rare** due to the following reasons:

- **No organised responsibility/leadership;**
- **Project consortium (partners of the transport chains) that worked well during the project is breaking up. Replacement partners can not be found in the short term.**
- **No (public) financing (especially in start-up phase after project), rail transport is expensive!**
- **No viable business model**
- **Business cases and commercial priorities of operating partners change**

All successful Implementation Cases managed to bypass these obstacles!

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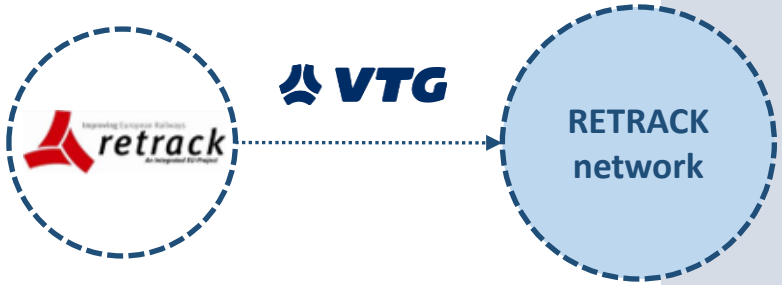
Implementation case: RETRACK network

Co-funded under FP6



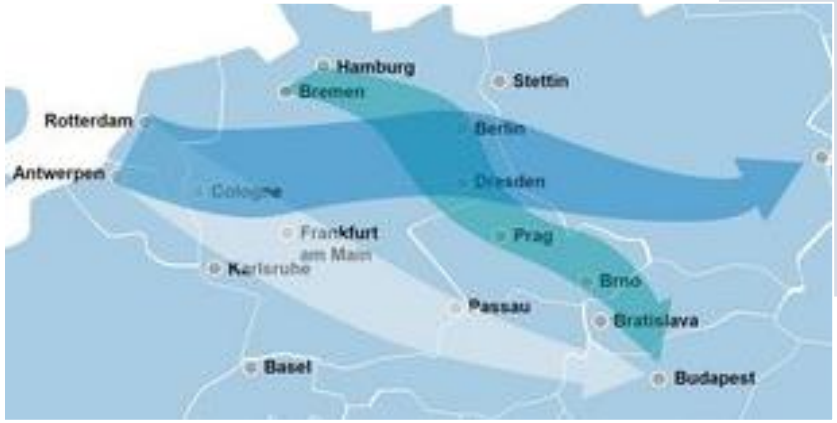
In 2007, multiple partners joined forces in the European RTD project **RETRACK** with the aim of simplifying single wagonload transport and offering customers a new cross-border European service with a reliable running schedule. RETRACK intended to develop a sustainable alternative concept to the national railway's single wagon system.

During the project a "demonstration train" has been operated on selected routes between the hubs Köln-Eifeltor and Györ with a secondary hub established in the Rotterdam region. The train

- has been operated by the RETRACK partner Transpetrol (a VTG subsidiary)
- has been composed of different wagon groups,
- integrated transport volumes of various customers – usually each being smaller than necessary for a block train –
- is suitable for all kinds of goods – from agricultural products and powdery bulk cargo to semi-finished products from coal and steel industry, chemical products incl. dangerous goods as well as machine parts and containers.

In 2014, after several partners had withdrawn from RETRACK, VTG took control of the project. Today, **VTG**'s RETRACK network

- provides a logistical link between the most important economic centers in Europe, covering Germany, Austria, the Czech Republic, Hungary and Slovakia.
- focusses on three main corridors with nodes, feeders and distribution antennas.
- acommodates individual wagons as well as wagon groups and complete freight trains,
- aims at optimizing rail freight transport, ensuring individually scalable and efficient transport services at stable transit times by intelligently linking all options in the route network of a given freight corridor.



Source: VTG

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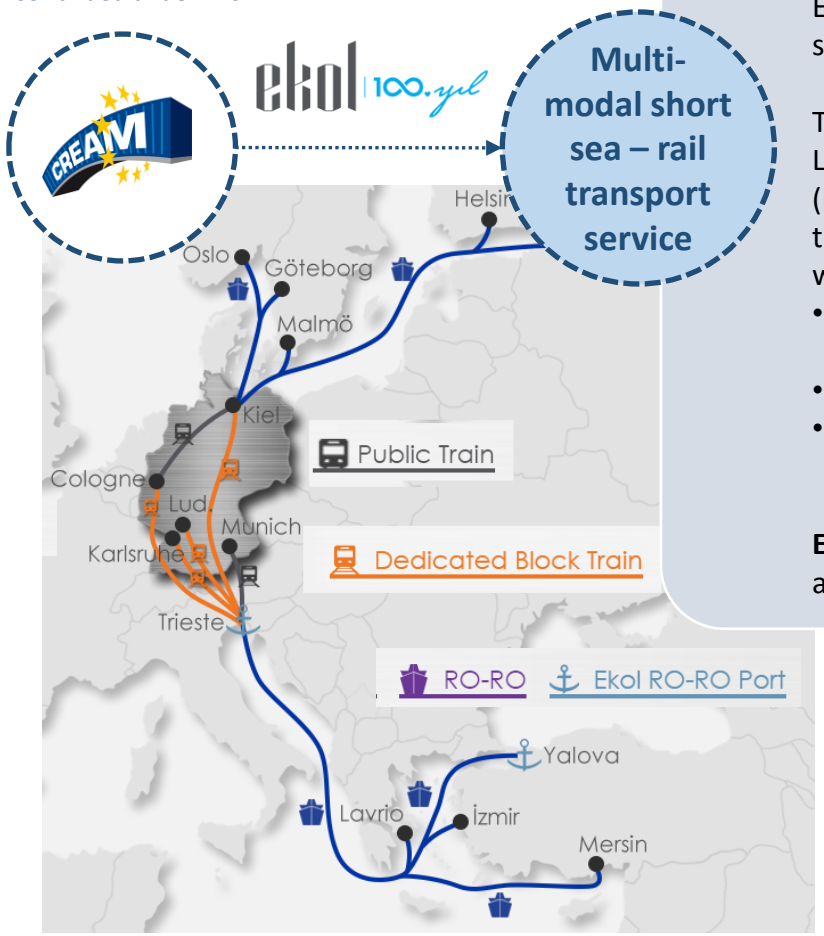
Implementation case: Multimodal transport service

Co-funded under FP6



Source: Ekol

The **CREAM** project – co-funded under FP6 - was set up to improve rail freight between Western and Southeast Europe. The project developed organizational improvements, technical solutions and competitive rail freight services, demonstrated on a Trans-European mega corridor between Beneluc countries and Turkey or Greece.

Turkish trucks travel up to 7.000 km in each round-trip on their journey to and from West European countries. Ekol Logistics – in collaboration with CREAM project partners Kombiverkehr, Lokomotion and Rail Traction Company (RTC) - , has developed an effective and environmentally friendly solution to this problem. A new intermodal transport system which reduced the share of land transport to only 2.000 km. In detail the new transport concept works like this:

- Turkish commodities are loaded to semi trailers, capable for being used in intermodal transport, and are hauled to Istanbul, Izmir and Mersin ports.
- There the semi trailers are loaded on board of Ro-Ro vessels and are transported to Italy in a 3-days ship passage.
- After arrival in the Port of Trieste, the semi-trailers are transhipped on the intermodal block train towards Germany.

Ekol has subsequently extended the scope and frequencies of the system; additionally the concept has been adapted by other companies (e.g. MARS Logistics).

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Implementation case: Train Monitor

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Co-funded under FP6

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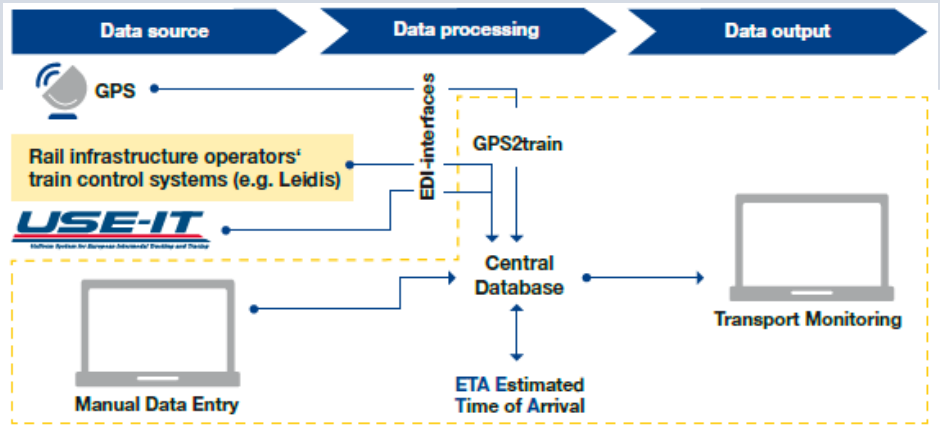
Train Monitor

The **CREAM** project – co-funded under FP6 - was set up to improve rail freight between Western and Southeast Europe. The project developed organizational improvements, technical solutions and competitive rail freight services, demonstrated on a Trans-European mega corridor between Beneluc countries and Turkey or Greece.

In correspondence to LSP information requirements, CREAM analysed different technical solutions based on GPS or simple tracking technologies and evaluated their applicability on the CREAM corridor. The results have been integrated in a comprehensive information management concept. Hacon in collaboration with Kombiverkehr developed the web-based IT system "Train Monitor" which closes existing information gaps by

- integrating train operation data from numerous sources (including GPS),
- providing estimated time of arrival (ETA) information,
- enabling management and exchange of further train information and
- including a train database for quality statistics and operation analyses.

The system is still in operation at **Kombiverkehr**'s transport control centre and has been the basis for the development of further **Hacon** software products.



Source: CREAM Final Report

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Implementation case: Intermodal network 2015+

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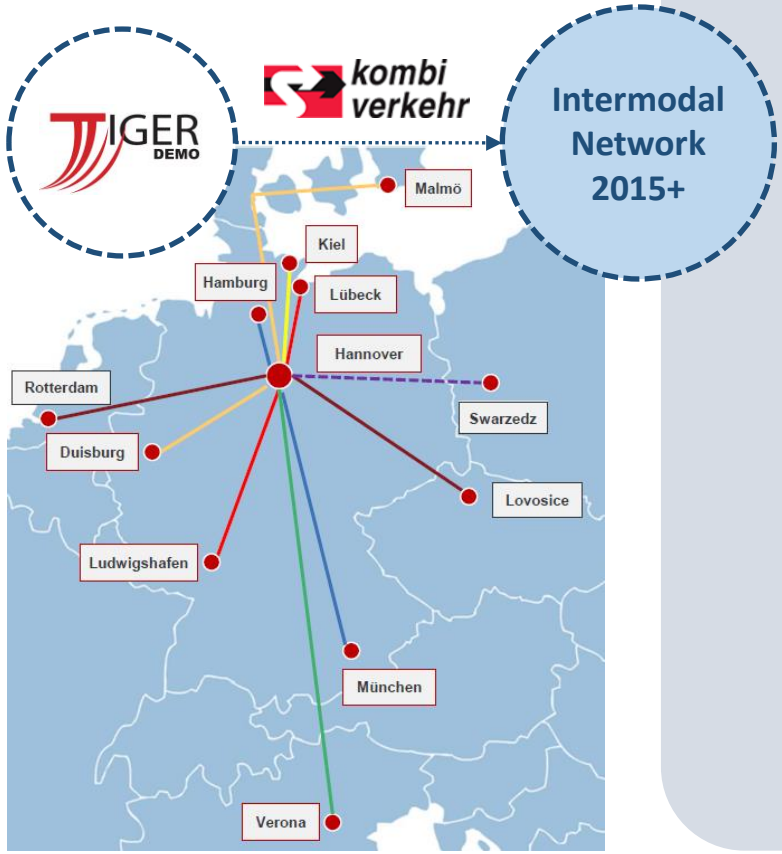
Co-funded under FP7



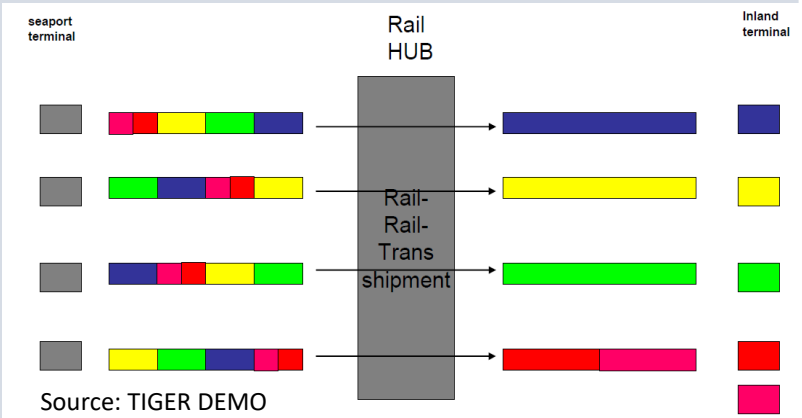
Kombiverkehr relations via Hannover-Lehrte 1/2023
Source: Kombiverkehr

TIGER DEMO was the logical follow-up and continuation of the TIGER project in which innovative concepts for rail-based intermodal hinterland connections of seaports have been developed. TIGER DEMO focussed on the implementation, execution and assessment of three demonstrators.

One of these demonstrators was the "**Intermodal Network 2015+**" of Kombiverkehr, a hub-and-spoke concept designed to integrate small and medium-sized intermodal terminals into hinterland networks. The general idea was to inter-connect intermodal trains with loading units for different destinations and to build new direct trains for destinations / terminals in the hinterland by (a) direct transhipment of loading units between trains or (b) via intermediate storage.

Different operational and technical components ensure a smooth functioning of the system:

- Direct long-haul train entrance with momentum and direct train departure;
- Automated longitudinal transport of loading units within the terminal to reduce gantry crane-movements;
- Customized train path and resource planning;
- Optimised terminal processes (supported by a Terminal Operating System);
- Information and communication technology (e.g. capacity management and train monitoring tools).



Source: TIGER DEMO

Within TIGER DEMO concept has been demonstrated in München-Riem (with reduced components). After opening of the **Megahub Hannover-Lehrte** the concept is operational since 2021 and continuously extended.

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Implementation case: Cross-border dispatcher

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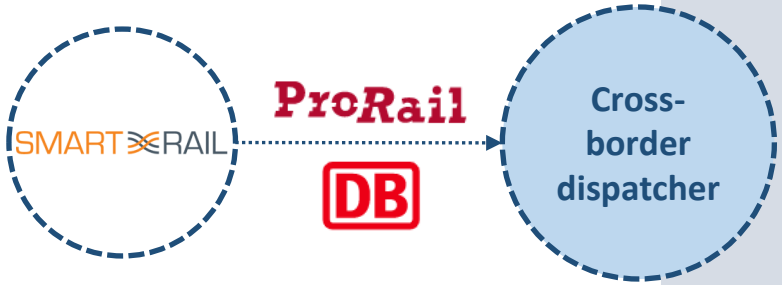
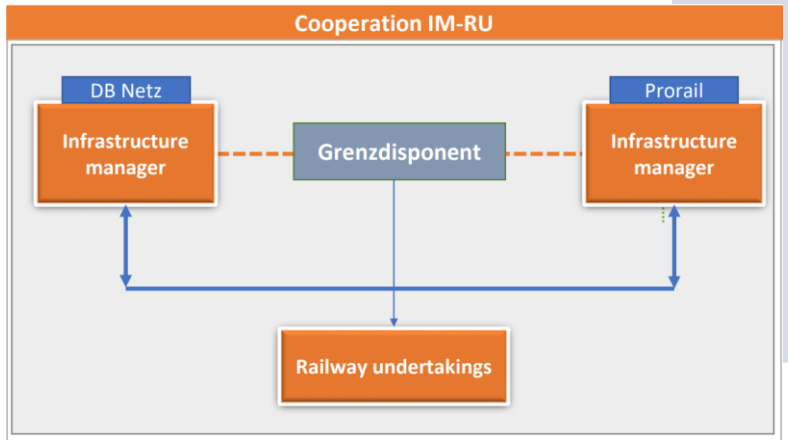
Co-funded under H2020





Source: SMART-RAIL

The **SMART-RAIL** project aimed to improve the freight rail services offered to the shippers by focusing on making improvements of reliability, lead time, costs, flexibility, and visibility. Solutions developed in the course of the project three were implemented and tested in three Continuous Improvement Tracks (CITs).

CIT 3 targets the Rotterdam-Genoa corridor and deals with rail freight reliability in case of (unexpected) obstructions on the track. It specifically aims to increase the flexibility and reliability of rail freight transport within a multimodal transport system.

One solution, analysed and developed in this context is the implementation of a border dispatcher, to ensure and optimise smooth rail operations on the cross-border rail sections between the Netherlands (Betuweroute) and Germany (Oberhausen – Emmerich). The border dispatcher is a joint function of the respective infrastructure managers **Prorail** (NL) and **DB Netz** (DE) and is located in the Central Office for border traffic in Duisburg. The idea of the border dispatcher is

- to connect the respective IM operation centres in the best way,
- optimise the coordination of dispatching decisions with respect to the concerned cross-border sections and
- bundle the information flows between railway operators (RUs) and infrastructure managers (IMs)

Meanwhile, the idea of a cross-border dispatcher is also transferred to other areas, e.g. to Polish-German border route Frankfurt (Oder) – Rzepin which is located on the Rail Freight Corridor North Sea - Baltic (RFC 8).

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Thank you!

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