ERFLS
European Rail Freight Line System

An illustration of the concept

provincie Gelderland

UNIVERSITÄT DUISBURG ESSEN

Stadt Lahr

Uniontrasporti

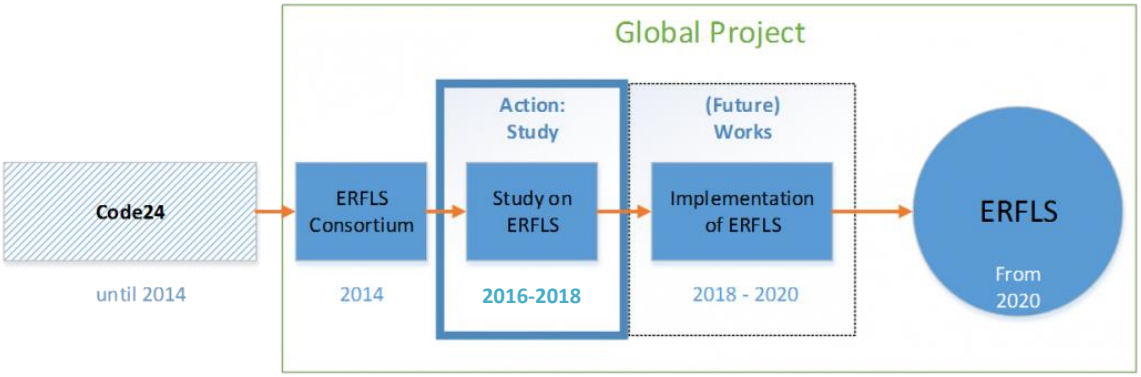
Istituto Superiore sui Sistemi Territoriali per l'Innovazione

CEF-Transport Action
(INEA/CEF/TRAN/A2014/1041829)

Co-financed by the European Union
Connecting Europe Facility

The aim of the project (the CEF Action)

The ERFLS Action aims to explore the **feasibility** as well as to propose an **implementation roadmap and investment plan** for the ERFLS service concept, which is illustrated in the following sections. The detail of the studies developed during the ERFLS Action should be such that the first rail services running according to the ERFLS concept may begin operating in 2020.



Who and when

ERFLS (European Rail Freight Line System) is a **study Action** successfully put forward for co-financing under the 2014 Transport call of the **Connecting Europe Facility** programme by a partnership led by

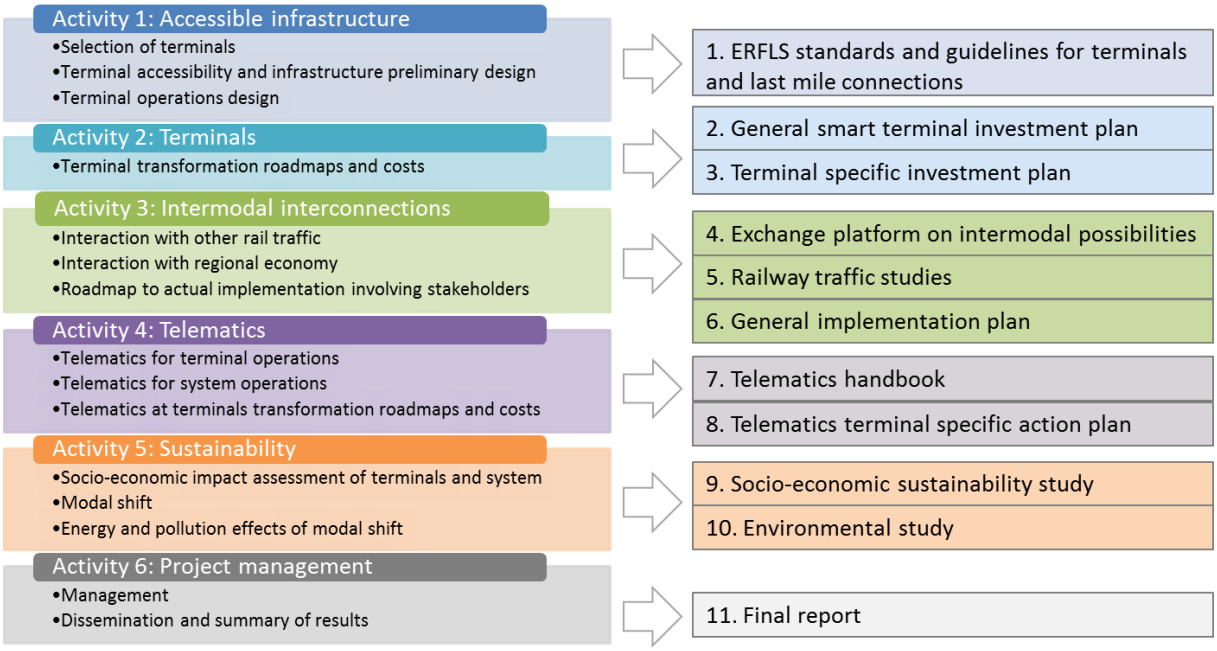
- the Province of Gelderland (NL)

and including

- the University of Duisburg-Essen (DE)
- the City of Lahr (DE)
- Uniontrasporti (IT)
- SiTI (IT).

The ERFLS Action started on 1 December 2015 and will be finalised by 30 November 2018.

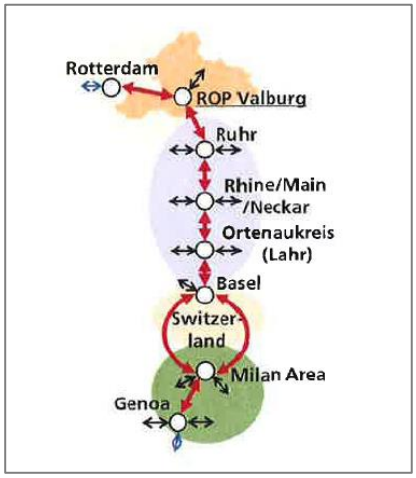
The on-going Activities and the outputs expected



The underlying objectives of ERFLS

- Make intermodal transport by rail more responsive to customer needs and therefore advance the shift of freight transport to rail;
- Serve regions with a high quality freight transport solution on tracks so as to further encourage the use of intermodal transport along the Rhine-Alpine Corridor and, as a prospect, along any other Corridor or trade lane equipped with railways;
- Provide the core of an integrated intermodal service with road-segments interfaced with the rail segment in an optimised way;
- Develop a new concept for intermodal freight trains with slots sold even shortly before loading;
- Better use capacity of rail infrastructure, intermodal trains, and terminals.

The study area



The study Action is being developed with the implementation on **the Rhine Alpine Corridor** in mind. However, attention is being paid to exchanges with other corridors, since the system may be deployed on any corridor or trade lane equipped with railways.

The base service concept

ERFLS is an intermodal freight transport concept based on block freight trains travelling according to a regular timetable along a corridor, picking up or leaving intermodal units at intermediate points between their departure and arrival terminals. Both the working of the trains and the way intermodal units are loaded and unloaded aim to resemble the operations of intercity trains for passengers.

How ERFLS is different from current services

The working of a conventional intermodal service

A common intermodal service concept involves a block train loaded completely at origin, unloaded completely at destination and not necessarily run regularly but depending on transport demand.

The working of an ERFLS intermodal service

The ERFLS entails trains calling at several terminal where containers are unloaded, and where containers for downstream destinations replace them.

In the example picture above, the ERFLS train departs from the origin terminal (on the left) loaded with containers destined to all the different terminals it will call at.

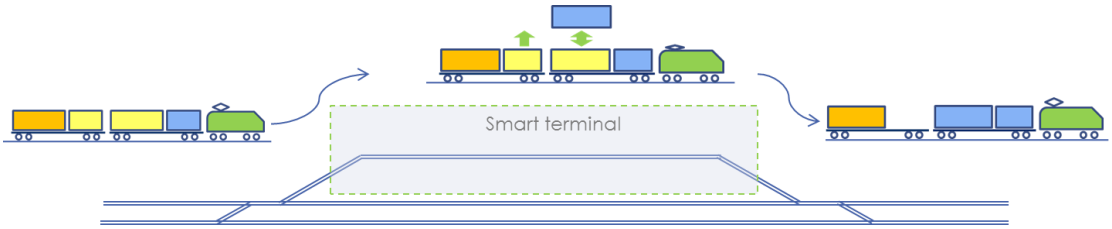
To ease the reading of the picture, containers and destination terminals are in the same colour. So in the picture, at the origin terminal the train is loaded with two containers for the Grey terminal, one for the Green terminal and one for the Orange terminal. Moreover, an arrow towards the train indicates the loading of the containers pictured in the same colour as the arrow (and the terminal). An arrow pointing away from the train symbolises an unloading operation.

Each time the train calls at a terminal, containers destined there are unloaded and containers for terminals further along the way may replace them. For instance, in the picture, at the Orange terminal a container is unloaded and a container destined for the next terminal along the way is loaded using the slot just freed.

The ERFLS services are intended to work on long distances calling at several terminals, and may or may not cover the whole distance of the railway corridor, depending on the demand for the service detected when the timetable is set up.

Smart Terminals and ERFLS trains: in and out of terminals just like passenger trains at passenger stations

Each time the ERFLS train calls at a ERFLS terminal (called Smart Terminal) it enters a siding linked directly to the main line and stops for the time required for the unloading and loading operations, keeping the locomotive in its composition. Finally the train resumes its journey by leaving the siding via a connection leading directly to the main line. No shunting is required and train dwell time at each terminal is expected to be 1-1.5 hours.

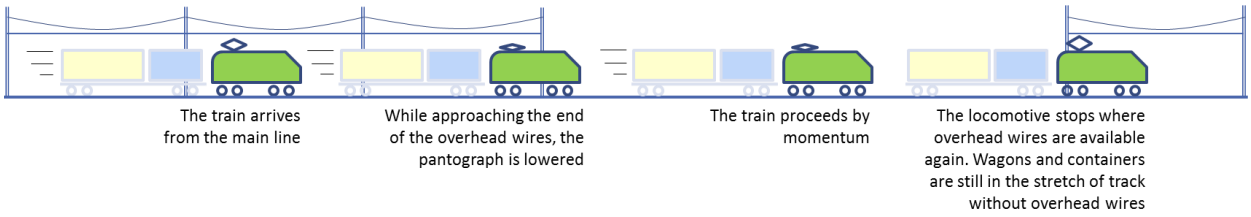


Smart Terminals' layout: a key enabling factor

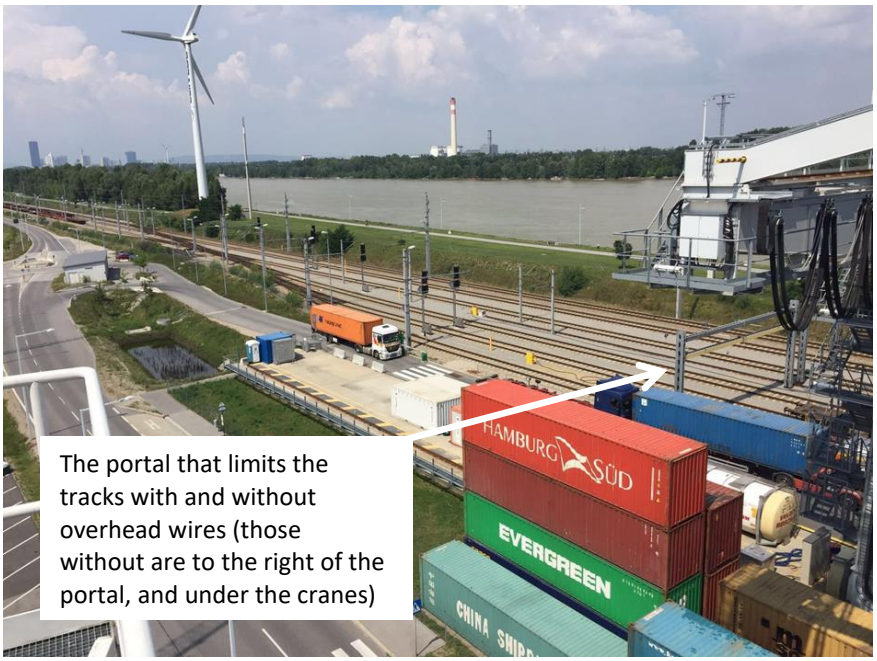
The layout of the smart terminals should be so that trains can arrive and leave without changing direction and without shunting. There should be direct access from the main line to the sidings where the ERFLS train is worked, and direct exit from that track to the main line. This is depicted in the figure above where the sidings to receive the ERFLS trains are in their ideal position: parallel and close to the main line. The **picture also illustrates the resemblance of Smart Terminals and through passenger trains stations** where tracks to receive trains are accessible from either side and are parallel to main line tracks.

Momentum access: no shunting and the locomotive stays with the train

A key element of the working methods at Smart Terminals is the possibility of using momentum access of ERFLS trains on the tracks for loading/unloading, which will have no overhead wires, except at their ends. Momentum access is the procedure whereby a train hauled by an electric locomotive proceeds along a track with no overhead wires thanks to the momentum gained until electric power was available, and eventually stops at a target point.



As shown in the picture above, when momentum access is used at a terminal, the train travels normally off the main line, enters the smart terminal, reaches the end of electrified tracks without stopping and places itself on a track with no overhead wires. The absence of overhead wires allows for safe operation of gantry cranes or reach stackers on the ERFLS train. This procedure is already in place in some terminals, among which Wien Freudenau in Austria. The following picture shows the Northern access to that terminal.



Momentum access and terminal layout to enable short stays

With momentum access the train requires no shunting to be placed in the crane working area. Moreover **there is no need to separate the train from its main line locomotive**. Instead, when leading the train by momentum access, the locomotive stops where overhead wires are available again. This way **the train is ready to go as soon as the loading operations are completed**. This will enable also short stays at Smart Terminals.

Smart Terminals: small changes to existing terminals to get the system started

Smart Terminals with the features described should be obtained by adapting existing terminals - preferably with small measures. Therefore benefits relating to both time and costs should be feasible, increasing the attractiveness of rail freight transport.

Telematics: making it all work together and enabling sales

Another key element enabling the ERFLS concept is an extensive use of **telematics which will link all the elements of the ERFLS chain: intermodal units, slots they occupy, trains, cranes, terminals, trucks, as well as managers, commercial departments and customers**.

ERFLS telematics will enable information sharing and transactions among stakeholders. Each ERFLS train service will offer a set of on-board spaces for intermodal units. The telematics system will support real time sale of on-board train space between any pair of smart terminals, much in the same way as tickets for intercity trains are sold to passengers at ticket desks and via the internet.

A practical means to optimise operations

Intermodal units come in different sizes (for instance 20', 40', 45' containers), have to be loaded and unloaded with appropriate equipment, possibly stored at Smart Terminals, and -finally- have to be transported on trucks from their origin or to their final destination, be it a plant next to the Smart Terminal (as may be the case in logistics villages) or in the terminal catchment area.

The telematics system will provide information on the location of the ERFLS trains, on the position of each intermodal unit on the trains to enable the optimisation of all of the operations listed above.

Now you know exactly where your containers are

Real time location of trains is normally available to infrastructure managers and to railway undertakings. With the ERFLS selected information may be relayed to terminal managers and to freight forwarders. **Terminal managers will be able to prepare intermodal units for loading so as to minimise the terminal dwell time of the train**, pass information on in order to **confirm or postpone calls to trucks for last mile delivery, optimise the work of cranes or reach stackers**. Freight forwarders and their **clients will have complete visibility of the position of their intermodal units**, thus enhancing transparency and perceived reliability of rail transport.

Contact person

The ERFLS – European Rail Freight Line System project manager and contact person is

Mr Joost Roeterdink of the Province Gelderland (The Netherlands)

email: j.roeterdink@gelderland.nl

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