

ERFLS

European Rail Freight Line System

Conclusions and Recommendations



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



**Co-financed by the Connecting Europe
Facility of the European Union**

1 Conclusions

The European Rail Freight Line System is feasible

The European Rail Freight Line System (ERFLS) Action, developed over the years 2015-2018, successfully investigated the feasibility of the concept of liner intermodal freight trains that make several short stops at a system of terminals along the Rhine-Alpine Corridor, where intermodal units are loaded or unloaded much in the same way as passengers get on and off intercity trains at intermediate stations.

Smart terminals will reduce times in terminals

Smart terminals are the cornerstone of ERFLS. They have layout and operational practices allowing for direct entry and exit of trains as well as for dwell times of intermodal trains as short as 2 hours. This compares to dwell times of 4-8 hours that are current practice. Smart terminals also have optimised road-side operations and exchange operational information among them through the ERFLS telematics systems.

Six terminals along the whole Rhine Alpine Corridor were examined and all can become smart terminals

The concept of smart terminals was investigated on six different terminals:

- RTG Valburg (planned), the Netherlands
- Duisburg Logport III (operational), Germany
- KTL Ludwigshafen (operational), Germany
- Lahr (planned), Germany
- Basel Weil am Rhein (operational), Germany, on the Swiss border
- Novara (operational), Italy

Each of them posed specific challenges. The Action put forward a number of feasible changes to layout and operations so as to allow for direct entry and exit of intermodal trains and to achieve substantial dwell time reductions.

Benefits also with limited changes to existing terminals

At some terminals operations and layout are already similar to those of smart terminals. This is the case in Ludwigshafen. Other terminals such as Novara or Duisburg require more important transformations. Time benefits can be obtained even when only a part of the possible measures to speed up dwell time at terminals are feasible.

Times and costs for adapting existing terminals are available

The study Action provided a description of how the terminals examined can be adapted to become smart terminals, also discussing alternative options. A first estimation of cost and times for works was also provided for each transformation option.

Operational improvements devised for ERFLS benefit all intermodal traffic

Operational rail side improvements and optimisation of road-side operations at smart terminals can be enjoyed by both ERFLS trains and conventional intermodal traffic. In fact, smart terminals do not have to be dedicated entirely to ERFLS trains.

ERFLS and smart terminals can already be obtained by optimising current technologies and practices, and are open to new technologies

ERFLS may be already implemented by using or adapting technologies currently available. Putting them together in a single concept led to operationalising the smart terminal model. However, the concept is not linked to the particular technologies considered in the Action. In fact, the ERFLS concept is open to new technologies that optimise intermodal operations.

Challenges and solutions to extend practices to new contexts

New contexts for existing technologies or procedures have revealed challenges that need to be addressed to have ERFLS services operating among a network of smart terminals. Challenges encountered comprise:

- the lack of operational rules for terminals along lines equipped with the ERTMS level 2 safety system which could possibly be solved by considering their similarity with passenger stations;
- the need to develop new procedures to have momentum access to terminals in some countries, such as Italy, whereas it is standard practice at some terminals in other countries (notably in Ludwigshafen or Wien);
- train path requests for freight trains travelling across several Countries and stopping only shortly at a number of terminals are complicated due to the need to coordinate several infrastructure managers and the Corridor One Stop Shop (C-OSS).

Successful solutions to those challenges can be attained by involving infrastructure managers and safety regulators in the setting up of ERFLS. Moreover, addressing those challenges would benefit intermodal rail freight as a whole, not just ERFLS.

ERFLS telematics will link all operators using their own systems

The Action confirmed that a telematics layer linking terminals, trains, slots and operators is feasible and may be already developed by building on current practice and ensuring that operators from terminals to forwarders and shippers keep using their own systems and their own data formats. Sharing of information will extend to road hauliers so as to support the optimisation of their work and the road-side operations at the terminals.

The ERFLS telematics layer is therefore a comprehensive step towards the digitalisation of intermodal rail freight.

Sharing of real time data about terminals, trains and intermodal units

Reliable real time information is critical to stakeholders and the ERFLS telematics system was designed so that it is assured. The Action developed a specification for the telematics component of ERFLS, detailing times and costs for its development and deployment. Suitable current technologies were identified but also the telematics component of ERFLS is readily open to new technologies.

The market potential looks rather good!

The Action included regional market analyses that revealed different situations at the terminals investigated but, altogether, a rather good potential for ERFLS except, perhaps, in a case such as Duisburg where the availability of intermodal transport is already very high.

Commercial appeal and devices to accommodate small intermodal flows

ERFLS aims to attract small flows from SMEs to intermodal transport. Discussing RTG Valburg, a major operator noted that even some ten intermodal transport units would commercially warrant a stop, which supports the value of the concept. Other stakeholders indicated the need to regulate the use of the trains to ensure that they are not booked entirely by the most significant flows along the most requested OD pairs.

Interaction with stakeholders requires a uniform sale channel

ERFLS should have a uniform sale channel, which is enabled by the proposed telematics system. The Action ascertained that a freight exchange platform would not be beneficial. Only once ERFLS is well established, could it be usefully included in a freight platform dealing with whole transport chains, but not in one concerning the sole rail leg.

ERFLS is an attracting alternative for a significant share of traffic along the Rhine Alpine Corridor

A detailed modelling exercise about freight transport along the Rhine Alpine Corridor considered rail, road and inland waterway as available options. The model revealed that even in a basic configuration with six terminals and the ports at either end ERFLS is an attracting alternative for a significant share of traffic which can amount to 7,400-10,070 million tonnes-km per year (14-18 million tonnes/year). This is equivalent to a 9-13% modal shift from road to ERFLS calculated for distances longer than 300 km.

ERFLS delivers the energy efficiency of rail to the cargo it attracts

The freight shifted to rail with ERFLS would entail saving 240,000-280,000 truck trips per year (91-104 million veh-km per year). This, in turn, saves 22,000-25,000 tonne of oil equivalent/year.

Intermodal transport with ERFLS leads to significant savings in CO₂ emissions

Shifting 14-18 million tonnes of freight per year to rail leads also to saving 63,000-72,000 tonnes of CO₂ emitted per year. This corresponds to the CO₂ absorbed in a year by 1,800,000-2,000,000 trees respectively.

Positive effects of ERFLS in terms of traffic, new jobs and remittances

The socio-economic analyses of the terminals and their catchment areas detailed the positive effects of ERFLS in terms of additional traffic at the terminals, corresponding turnover and remittances as well as expected new jobs. In the best scenario they can be as follows:

Terminal	Additional ITU	Turnover (€ X1000)	Income (€ x1000)	Tax (€ x1000)	New jobs
Valburg	80,000	24,092	1,606	8,834	402
Duisburg	110,000	32,883	2,192	12,057	550
Ludwigshafen	58,000	17,299	1,153	6,343	300
Lahr	61,000	18,225	1,127	6,700	300
Weil am Rhein	61,000	18,299	1,220	6,710	300
Novara	77,000	23,018	1,535	8,440	380

Strengthening the rail system along the Corridor will assist the development of ERFLS

The Action delivered SWOT analyses of terminals' catchment areas which showed the strengths of the locations due to the local economic systems and often also to the features of the terminals. However, the SWOT analyses noted the weaknesses due to capacity limits at several terminals (among which Weil am Rhein and Novara), issues with congestion – and bottlenecks – along several stretches of the Corridor (for instance, at the end of the Betuwe line) and the important threat due to the current lack of competitiveness of rail as compared to road transport. Those points call for incentives, improvement of the terminals, and enhancement of the railway lines to further the use of intermodal rail.

2 Recommendations

Develop a pilot with test trains and terminals to demonstrate the concept

The Study Action confirmed the feasibility of the European Rail Freight Line System concept. The next step is to set-up a partnership able to run ERFLS trains between smart terminals with at least an initial telematics system, so as to demonstrate the concept and its advantages in practice. A successful pilot would also set the basis for the actual full implementation. At least a rail operator, an intermodal operator, and a minimum of three terminals should be among the interested partners developing the pilot project. It would be beneficial if also some shippers joined the partnership. The market power of shippers would establish and develop the demand for ERFLS services so that the pilot could further develop into regular services, not just on the Rhine Alpine Corridor but also on the other TEN-T rail corridors.

Involve infrastructure managers and safety regulators in the pilot

The study Action revealed a number of difficulties due to using existing technologies and practices in new contexts (among them: momentum access, train movements from ERTMS level 2 lines into terminals). Dealing successfully with such items requires involving infrastructure managers and safety regulators in the development of the pilot implementation. In particular, the cooperation between the terminal manager and the infrastructure manager is critical for the successful implementation of momentum access.

Terminals should cooperate and take the lead to develop ERFLS

All parties involved in intermodal transport may benefit from ERFLS trains, but terminals are those that would benefit most from increasing and optimising their traffic, as well as gaining a more prominent role in the local economic system. Moreover, terminals would be the actors most interested to attract smaller flows, which are the target of ERFLS, with a view to making rail transport more flexible. Therefore, terminals should take the lead in developing ERFLS along the Rhine-Alpine Corridor.

Policy should support systems instead of single terminals

Having terminals develop and work as a system with other actors is key to establishing ERFLS. To this aim, policy actions should include supporting and funding whole intermodal systems across Countries instead of single terminals only.

Keep it at Corridor level

Transformation of terminals may bring local benefits, since the measures suggested to obtain smart terminals are generally valid to optimise intermodal operations. However, to reap the full benefits of ERFLS, operations should be optimised at corridor or system level. Only by fully developing the ERFLS concept as a system along a corridor may all stakeholders benefit, and therefore could have a strong interest in the concept. For instance, were a terminal to optimise operations on its own, only limited benefits due to an improved load factor would accrue to transport operators, and no benefits from improved access to intermodal transport – due to more stops – would go to the local economic system.

ERFLS should be integrated in the TEN-T network and benefit from TEN-T funding

The Rhine-Alpine corridor extends across several countries and so do other Corridors along which the ERFLS system could be foreseen. ERFLS is therefore a concept at EU level and in order to support it, it should become part of EU governance of corridors. This should occur by including ERFLS in the TEN-T definition, incorporating it in the TEN-T implementation, and allowing ERFLS to access TEN-T funding.

The Rhine Alpine Corridor is the right freight lane to set up ERFLS

The present study Action focussed on the Rhine Alpine Corridor and it would be the best option to set up pilot ERFLS activities due to the significant intermodal flows and the existing cooperation structure among stakeholders (in particular, the existence of the Rhine Alpine EGTC).

Include terminals in Corridor governance

The ERFLS partnership realised how important is the pivotal role that terminals play in the system. That hinge function is crucial and warrants a more important role for terminals in the governance of the Corridors than they currently have.

Exploit the synergies

ERFLS is about the digitalisation of rail freight to exploit the untapped potential of information that each stakeholder could distribute. Synergies with other Actions and projects providing complementary products are required. One example of such a project is ELETA, the CEF Action started in 2017 on estimating the time of arrival of intermodal trains at terminals. That information would enrich the set of data that ERFLS intends to distribute in order to optimise operations.

Build on the environmental benefits

The benefits of ERFLS in terms of reduced carbon footprint and reduced negative impact on communities thanks to organised flows should be demonstrated during the pilot and used to promote the system further.

Build on the consistency of ERFLS with the EU policy outlook

A proposal to amend Directive 92/106/EEC on Combined Transport was put forward in 2017 and is currently still being discussed. The main objective of the proposed amendments is to reduce the negative effects of transport activities and put more effort in reaching a shift from road transport to rail or waterways transport. Art. 6 of the proposal includes measures to support investments in terminal construction and expansion. It also indicates that Member States should support investments in the operational efficiency of existing terminals with a view to have a balanced distribution of facilities across Europe, notably on the TEN-T network. Moreover, the proposed amendment suggests that Member States take further measures to support the competitiveness of combined transport as compared to road transport.

Although currently the amendment to the Directive is still being debated, the measures mentioned above are in line with recent European transport policy and ERFLS fits their objectives. Therefore, the progress of the amendment should be monitored and used to support the development ERFLS in practice.

Improve the flexibility of rail path bookings procedures

The Action experienced difficulties when trying to discuss train paths along the whole Corridor and considering stops at intermediate terminals. Ways to deal with prospective train paths requests should be more flexible allowing for new products on the tracks.