Design features for support programmes for investments in last-mile infrastructure

Final report

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Executive Summary

Objectives, scope and content of the study

In the last years, one of the main **challenges for the European Union and its Member States has been the realisation of rail infrastructure on the identified rail freight corridors.**

The EU needs a "core network" of corridors, enabling a high-efficiency and low-emission circulation of large and consolidated volumes of freight traffic, with extensive use of more efficient modes in multimodal combinations and the widespread application of advanced technologies and infrastructure. In particular, the core network should focus on the **completion of missing links** (also in terms of capacity and performance of the infrastructure) – mainly cross-border sections and bottlenecks/bypasses –, on the **upgrading of existing infrastructure** and on the **development of multimodal terminals.**

Investing and developing the rail last-mile infrastructure, which contributes to achieve all these objectives, **is** thus **essential**.

Moreover, as highlighted in the 2014 single wagonload study[1], wagonload traffic suffers from:

- a general reduction of the volumes of some commodities often transported by wagonload;
- high costs and low profitability of wagonload services;
- **lack of investments in last-mile infrastructure**, **including private sidings,** which should be extended and upgraded, as the majority of the sidings were built more than 50 years ago.

In this view, the European Commission launched this study to appraise the **design features for supporting programmes for investments in last-mile infrastructure**. The study aims to:

- identify, and analyse the support **programmes/instruments dedicated to** the financing and development of last-mile infrastructure available in the European countries;
- identify, and analyse **other relevant programmes/instruments** available at both EU and national level**,** which, although not specifically dedicated to this objective, may support the financing and development of last-mile infrastructure;
- provide **suggestions, contribution** and **recommendations** on how to develop, update and monitor a last-mile support programme;
- identify **investment needs** for the construction, revitalisation, and modernisation of last-mile infrastructure across the EU.

The study has been developed mainly through a ***comprehensive stakeholder consultation***, involving more than ***800 stakeholders*** **(in particular infrastructure managers, logistics operators, industry associations and port authorities),** and a continuous ***interaction with Member States***.

Last-mile infrastructure definition and types

The "**last-mile infrastructure**" is a ***"section of rail infrastructure between the entry point to the main network and the final destination/starting point of a train"*** (e.g. tracks located within other facilities, terminal in a port, maintenance workshop, siding of an industrial plant,); including a junction point, that provides the link to the main railway network[2].

The last-mile infrastructure **comprises a large variety of different infrastructure configurations associated with respective modes of operation**.

[1] Study on Single Wagonload traffic in Europe – challenges, prospects and policy options, PwC, 2014
[2] Sidings & last miles – EU point of view. House of Rail conference on "Sidings & last miles" Brussels, 28 November 2008. Accessible at: http://www.erfarail.eu/uploads/pageImages/working_issues/house%20of%20rail/EU_DG_TREN_MCastelletti_28_11_08.pdf

- **Private sidings**: privately owned and operated pieces of rail infrastructure, connecting loading facilities (which are not part of the rail infrastructure) to the public rail network. Within this study, private sidings mainly refer to industry sites (manufacturing plants).
- **Stations with public sidings**: this category includes publicly accessible loading tracks (team tracks with or without loading ramps), mostly located directly within public railway stations and owned by the respective infrastructure manager.
- **Intermodal terminals:** terminals designed for the transhipment of standardised loading units (containers, swap bodies, trailers) between at least two modes. In most cases they are publicly accessible, but some of them are privately operated (e.g. in seaports), sometimes even as private sidings. Within this study, only terminals with rail connection (rail/road or rail/road/water) are considered.
- **Rail logistic centres** ("railports"): in this study, the term describes conventional and intermodal transhipment stations. Beyond pure transhipment, rail logistic centres also provide additional services like storage, consignment, or road pre-/end-haulage.

Outcomes of the analysis

Stakeholder consultation

A comprehensive stakeholder consultation consisted of two phases:

- The first phase was aimed to collect information on the **programmes in place**. It was performed through an open consultation (a questionnaire-based survey) and a series of interviews, carried out in order to gather and collect all the necessary data about the existing/dedicated support programmes;
- The second phase supported the assessment of the **investment need.** During this phase, information provided by each stakeholder was used to support the quantification of the necessary investments in rail last-mile infrastructure.

Different needs have been highlighted by the different groups of stakeholders involved in the consultation.

Specifically, interviews performed with **Member States** revealed:

- The necessity of a greater focus on intermodal platforms and all last-mile infrastructure facilities (e.g. terminals, marshalling yards, and cross-border infrastructure);
- The importance of concentrating on innovation-related investments (e.g. IT systems).

Other stakeholders highlighted the need for:

- Higher involvement of **Regional Authorities** to develop traffic flows for **territorial cohesion** (Italian Railway Infrastructure Manager);
- **Less bureaucracy** when developing new last-mile infrastructure links (Italian Railway Infrastructure Manager);
- **Implementation of an interoperable capacity management system** to monitor traffic flows (Italian Railway Infrastructure Manager);
- **Extension of eligible costs** to include expenditures related to land acquisition (Infraestruturas de Portugal, S.A);
- **Increased integration** of the different **last-mile infrastructure managers** and **coherence** of their **development plans** (Italian Railway Infrastructure Manager);
- **Clear and exhaustive information** about the application process (German Railway Undertakings and Federation of Inland Ports).

Finally, it is worth knowing that several railway undertakings and logistic nodes' managers operating in some ports highlighted the following necessities:

- Need for **more effective integration of the railway and the port systems**;
- Need for **measures to simplify and promote the digitisation of the procedures** in order to develop competitive intermodal services;
- Need for **reviewing the system of incentives**;
- Need for **extending tracks to the terminals within the ports**.

Dedicated programmes/instruments in EU

A wide range of programmes is currently available to support transport infrastructure across Europe, from more generic and broader scope to more specific ones. However **only few countries have introduced dedicated support programmes for investments in the rail last-mile infrastructure**.

Dedicated support-programmes are all the schemes **specifically set up by European countries** – either at country, regional or local level – with the aim of **building, extending, reactivating, and maintaining last-mile infrastructure**. An extended definition of the term may include also broader support programmes **whose budget is partly dedicated to last-mile infrastructure** or envisaging other obligations related to this kind of investment (e.g. funding granted only to investment with a compulsory minimum percentage of last-mile infrastructure).

Three countries in Europe are currently providing dedicated programmes supporting investment in last-mile infrastructure:

- **Austria** (*Programm für die Unterstützung des Ausbaues von Anschlussbahnen*);
- **Germany** (*Richtlinie zur Förderung des Neu- und Ausbaus sowie der Reaktivierung von privaten Gleisanschlüssen*);
- **Switzerland** (*Aides financières pour voies de raccordement*).

The key features of these instruments include the **share of funding** achievable by the applicant; the **minimum-maximum thresholds** set for granting aid and the **form of financing** adopted (see Table 1).

In this regard:

- The share of funding that can be allocated to the construction, extension or reactivation of sidings ranges between **25% and 50% in Austria**, between **40% and 60% in Switzerland**, while in **Germany** may reach **up to 50%** of the eligible costs.
- Austria and Germany set the **same minimum project threshold** for granting funding (€ 15,000), which is **significantly lower** than the one set in the Swiss case (€ 28,892).
- As for the maximum project threshold, Austria and Germany **set different ceilings based on the type of intervention**:
  - In case of **construction of sidings**, the Austrian authority provides a maximum budget per project **equal to € 2.5 million**, while in Germany each project related to the construction of sidings may **not receive more than € 8 per additional tonne/year** or **€ 32 per additional 1,000 tonne-km/year** as funding.
  - In case of **extension/renewal** of sidings, Austria set a financial aid threshold of **€ 2 million per project**, while in Germany the support may **not exceed € 6 per additional tonne/year** or **€ 24 per additional 1,000 tonne-km/year**.
  - Switzerland, instead, set a **unique maximum threshold** for financing either the construction or extension/renewal of sidings that cannot exceed **€ 29** for **each tonne transhipped annually** through sidings, and **€ 4,235** for **each metre of mother siding**.
- The **form of financing adopted is generally only non-repayable grants** (loan or PPP are not generally used).

Table 1 - Rationale of the dedicated programmes for financing

Country	Share of funding - eligible costs:	Minimum project threshold	Maximum project threshold		Form of financing
			New construction	Extensions/Renewal	
Austria	25% to 50%	€ 15,000	€ 2.5 million per project	€ 2 million per project	Non-repayable grants
Germany	Up to 50%	€ 15,000	€ 8 per additional tonne/year or € 32 per additional 1,000 tonne-km/year	€ 6 per additional tonne/year or € 24 per additional 1,000 tonne-km/year	Non-repayable grants
Switzerland	40% to 60%.	€ 28,892	The maximum federal co-financing is limited and cannot exceed € 29 (30 Swiss francs) for each tonne transhipped annually through sidings, and € 4,235 (4,400 Swiss francs) for each metre of "mother siding" (this term identifies tracks linking the main network with several sidings).		Non-repayable grants

Although analysing the impacts of the dedicated programmes on the rail freight transport is a complex task, **it is clear that the investments in last-mile infrastructure represent one of the key factors of the growth of railway freight transport**.

Indeed, the analysis of the goods transported by type of transport in Austria, Germany and Switzerland in the period 2009 – 2014, during which the support programmes operated (the German one was extended until 2016), highlights a **positive compound annual growth rate (CAGR) of about 3.1% compared with a positive rate of about 1.8% in EU-28**.

The main findings of the analysis of the dedicated support programmes are reported below:

- In **Austria** and **Germany**, the programme's **beneficiaries** are generally **private undertakings**, while in **Switzerland public bodies may also benefit** from funding **under the condition** that the project concerns **"mother sidings"** (tracks linking several sidings to the main rail network);
- In **Germany and Switzerland,** the method for calculating financial assistance is **performance-based** (e.g. freight volume to be generated or transported on the sidings), while in **Austria** subsidies are simply calculated **multiplying eligible costs by the respective co-financing quotas** set out in the programme. A full/partial **repayment of the grant** is required if the **commitments are not honoured** by the beneficiary;
- In **Austria, Germany and Switzerland**, the ***success rate* of the programmes** – calculated as the ratio between the number of applications submitted and approved – **was very close to 100%**;
- The evaluation of the **German support programme** showed that a sustainable shift of freight volumes from road to rail has been achieved by focusing on last-mile infrastructure, with a relevant avoidance of truck drives. Furthermore, the analysis demonstrated that **without the respective funding of the last-mile infrastructure, the development of conventional rail transport would have been significantly lower**;
- The German programme for sidings exclusively supports last-mile infrastructure, built by the respective operator. Thus, the maximum funding rate has been limited to 50%. In addition, **siding operators applying for the support programme have to prove the planned modal shift effect**. Between 2004 and 2010, **the programme achieved an avoidance of 450 Mio truck trips or 10 Mio tonnes of greenhouse gas emissions per year**. A funding volume of 48 Mio € enabled investments of 130 Mio €. The modal shift achieved, CO2 savings and employment effects resulted in a benefit for the economy of 25.5 € for each funded Euro;
- **Dedicated programmes appear to be more suitable in achieving last-mile development** both in terms of **effectiveness** (e.g. rail freight volumes, capacity of the railway infrastructure) and **efficiency** (dedicated programmes enable a more rational use of financial resources, by concentrating them only on last-mile infrastructure projects and ensuring a greater impact).

Non-dedicated programmes/instruments at EU and country level

More than **70 programmes** have been analysed at EU level (10) and country level (62). The non-dedicated programmes have been classified into three categories: **Low relevance (LR), Relevant (R), Highly relevant (HR).**

Figure 1 - Non-dedicated programmes at EU and National level

EU level

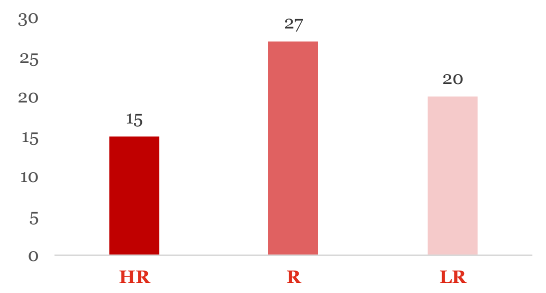
	Time frame: 2014 - 2020 (or beyond)	
HR	Connecting Europe Facility (CEF)	€ 26.2 bln
HR	ERDF (Transport)	€ 25.6 bln
HR	Cohesion Fund (Transport)	€ 10 bln
HR	TEN-T Programme	€ 8.1 bln
HR	Marco Polo II (2007-2013)	€ 450 mln
HR	Shift2Rail	€ 920 mln
R	Marguerite Fund	€ 710 mln
R	EBRD Instruments	€ 10 bln*
R	European Investment Bank LGTT	€ 1 bln
R	European Investment Bank SFF	€ 3.75 bln

* Covering transport infrastructure projects in the period 1992-2012

National level

10 EU Member States currently have (or had in the past) **national funding schemes** in place.

Number of the non-dedicated programmes at National level



HR: Austria (1), Czech Republic (1), Germany (1), Hungary (1), Italy (1), Lithuania (1), Netherlands (3), Poland (3), Romania (1), Slovakia (1), Slovenia (1)

Low relevance (LR): programmes/instruments focused on other domains than transport or transport infrastructure (potential to cover last-mile only marginally and exceptionally)

Relevant (R): programmes/instruments covering the transport sector and focusing on issues not necessarily related to last-mile (e.g. transport services; innovation)

Highly relevant (HR): programmes concerning specifically the transport sector and zooming on transport infrastructure, including rail infrastructure

The main findings of the analysis of the non-dedicated support programmes are reported in the Table 2:

Table 2 - Non-dedicated support programmes

Non-dedicated programmes	Main findings
Non-dedicated programmes at EU level	• Six EU programmes are considered **highly relevant** for last-mile infrastructure: **Shift2Rail, CEF, TEN-T, European Regional Development Fund, Cohesion fund, Marco Polo II**; • Most of the EU level programmes **focus on investment in infrastructure** (TEN-T, CEF, ERDF, Cohesion Fund, Marguerite Fund, EBRD and EIB facilities), while other programmes **focus on services and infrastructure** (Marco Polo II) and research and innovation (Shift2Rail); • Most of the analysed instruments provide **non-refundable financial assistance in the form of grants**; • Most instruments (TEN-T, ESIF, Marco Polo II) cover a **wide range of potential beneficiaries**: infrastructure managers, public administrators, international associations, private undertakings, public-private partnerships
Non-dedicated programmes at National level	• A total of **62 funding schemes and instruments** have been found in 23 Member States; • **10 Member States have their own national funding schedules**[3] and **13 Member States use non-dedicated co-financed programmes to finance last-mile infrastructure**[4]; • **Most of the incentives for last-mile infrastructure come in the form of financial support, notably through grants**, although loans and guarantees are also applied. Other incentives, such as concessions and tax agreements, are also used, but on a much less frequent basis; • The potential beneficiaries are similar across the Member States.

[3] Austria, Denmark, France, Germany, Ireland, Italy, Netherlands, Poland, Spain and United Kingdom

[4] Bulgaria, Croatia, Czech Republic, Estonia, Finland, Greece, Hungary, Latvia, Lithuania, Romania, Slovakia, Slovenia and Sweden

As highlighted previously, a consistent part of the non-dedicated support programmes seems to be suitable to partly support the investments in last-mile infrastructure.

Investment needs/potential in EU

At present, about 22,120 last-mile infrastructure facilities exist in Europe[5]. Nearly three quarters (~ 15,600) of these access points are private sidings. The remaining quarter is mainly composed by stations with public sidings (~ 5,600), while intermodal terminals (~ 730) and rail logistic centres (~ 190) are fewer.

The rail market is evolving and last-mile infrastructure develops accordingly. From the results of the sectoral trends' analysis, it is expected that the relevance of the four above-mentioned types of last-mile infrastructure will develop towards different paths, as outlined in the following table.

Table 3 – Freight market analysis per types of last-mile infrastructure

Types of last-mile infrastructure	Market development
Private sidings	**The number of private sidings has decreased significantly over the last years**. Most sidings, which were extensively used by block trains or wagon groups are still in operation. Contrastingly, many of the less utilised sidings are no longer operated. For the future, further consolidation process is expected: **large existing private sidings will be used more extensively than today, while smaller facilities will be abandoned**. Overall, the number of private sidings in Europe will further decrease. **New or revitalised facilities** due to national and international funding programmes and the relocation of industrial manufacturing centres in (South) Eastern Europe will **only partially balance the overall decrease in the number of active private sidings**.
Stations with public sidings	**The stations with public sidings,** apart from dedicated niche markets or services provided by regional rail operators, **will lose their importance**. Rail logistic centres will replace some of them.
Intermodal terminals	**Many existing Intermodal terminals will reach their capacity limits**. As new construction is problematic in areas of high demand, the expected volume increase will mostly be covered by upgrade of existing facilities. In consequence, a moderate growth of the number of intermodal terminals is expected.
Rail Logistic Centres ("railports")	**Rail Logistic Centres** ("railports") **are designed to partially balance volume losses of single wagon transport and to offer additional services**. Their number is expected to rise strongly, especially in those countries that intend to give up single wagon transport.

To identify the demand for investments, the expected evolution in the type of last-mile infrastructure was analysed jointly with that of the overall freight transport market. Specifically, the following main trends have been identified:

- **The current framework conditions of the freight market in Europe favours road transport against other modes**.
- Only approximately **10%**[6] of transported goods is moved on **railways**. **Conventional transport (block trains and single wagonload) still dominates the market, with 82% of the total rail volumes**. Despite the lower market share, intermodal transport is strongly increasing its relevance, in particular in Western, Central and Southern Europe.
- **Rail production systems have a considerable impact on last-mile infrastructure**. Last-mile infrastructure and operations must balance framework conditions set by both railway operators and by manufacturers. If these perspectives diverge, last-mile infrastructure and operation becomes more complexwith consequent impact on the need for investment.
- **Conventional rail traditionally serves the energy-related freight market (coal, mineral oil products), steel (coal, coke, ore, and steel/metal products), automotive, chemical products and paper/wood**. These markets contribute by 64% to the overall rail freight volume in EU28+2. They are generally characterised by strong market position against road and inland waterways modes, but also by a rather stagnant/decreasing perspective for the future. From a logistics perspective,

[5] EU-28 plus Switzerland and Norway
[6] Modal share calculated on tonnes transported per mode of transport.

the steel, chemical and automotive industries contribute the most to the demands for last-mile infrastructure and operation.

To forecast the future demand for last-mile transport volumes, as well as infrastructure and investment needs for the time horizon 2030, HaCon developed a model that considers the following main parameters:

- **Four different types of last-mile infrastructure** (Private sidings, Stations with public sidings, Rail logistic centres (Railports) and Intermodal Terminals);
- **Economic development in European countries** (differentiation of four "country clusters") with respective consequences for the relevance of different types of last-mile infrastructure and their incorporation in rail production schemes;
- **Technical innovations** with particular impact on last-mile operation (e.g. Hybrid locomotives, standardised wagons);
- **Political framework conditions** influencing competitiveness of rail freight and consequently cost pressure on actors in the rail freight business.

Variations of these parameters have been bundled in **three scenarios (”Trend", Minus", "Plus").** Table 4 provides an overview on the main framework conditions and aggregated results.

Table 4 - Matrix of the developed scenarios

Scenarios	Main assumptions for the development of last-mile infrastructure	Variation of rail transhipment volume (t) compared to the basis year (2010)	Variation of the number of the Last-mile infrastructure facilities compared to Status Quo (2015)	Investment needs for Last-mile infrastructure (2015-2030)
Trend scenario "2030"	Extrapolation of current tendencies (i.e. increase of large sidings; abandoning of many small and some mid-sized facilities; Public sidings will lose their relevance; Rail logistic centres will (partially) substitute closed private and public sidings); intermodal volume increase will be handled primarily by upgrading/modernisation of existing facilities.	+19%	-27%	€ 9.7 billion
Minus scenario "2030"	Unfavourable conditions for rail freight compared to "Trend" (i.e. higher concentration on large Private sidings; above-average abandoning of small- and mid-sized Private sidings; Public sidings will significantly lose their importance); Framework condition for the development of intermodal terminals do not change significantly compared to the Trend scenario.	-2%	-49%	€ 8.9 billion
Plus scenario "2030"	More favourable conditions for rail freight compared to "Trend" (i.e. ongoing trend to large private sidings; above-average "survival" of small- and mid-sized private sidings). Framework condition for the development of intermodal terminals do not change significantly compared to the Trend scenario	+28%	-20%	€ 11.2 billion

The main outcomes of these model calculations are:

- The total **transhipment volume** in EU28+2 was about 2,488 Mio t in 2010 (the basis year for the volume forecast), thereof 89% represented by conventional and 11% by intermodal access points to rail freight. For the "Trend 2030" scenario, an increase to 2,958 Mio t is expected (+19%). The lion´s share of this volume growth is allotted to intermodal (+89%) compared to +10% for conventional transport.

For the "Minus 2030" scenario it is assumed that the (unfavourable) framework conditions will reduce transhipment volumes by 20% for conventional and by 5% for intermodal transport compared to the Trend scenario. For the overall European transport market this means a remaining transport volume of 2,446 Mio t in 2030 (i.e. -17% in comparison with the Trend scenario and -2% compared to the basis year 2010).

For the "Plus 2030" scenario it is assumed that the (more favourable) framework conditions will increase transhipment volumes by 5% for conventional and by 20% for intermodal transport compared to the Trend scenario. For the overall European transport market this leads to a transport volume of 3,185 Mio t (i.e. + 8% in comparison with the Trend scenario and +28% compared to the basis year 2010).

- Based on this volume development in connection with the main trends, the number of **last-mile infrastructure facilities** in Europe will decrease from 22,120 in 2015 to about 16,200 in the "Trend 2030" scenario (- 27%). This decrease is due to Public Sidings (-59%) and to (small/mid-sized) Private Sidings (- 19%); in contrast, a considerable growth of Rail logistic centres (+ 173%) and a moderate growth of Intermodal Terminals (+ 5%) is expected in the Trend scenario.

  The "Minus 2030" scenario shows nearly a halving of 2015 facilities' number (or -30% compared to the Trend scenario) to some 11,300. This figure implies that Public Sidings will nearly disappear and only large Private Sidings will survive. Rail logistic centres and Intermodal Terminals show a slight increase compared to 2015, but also an intensified tendency towards concentration on large facilities.

  The "Plus 2030" scenario contains about 17,800 last-mile infrastructure facilities in Europe, which is 10% above the Trend scenario, but 20% below the 2015 figure. This means that the general tendency to concentration will be valid also under more favourable conditions for rail freight. In this scenario, particularly (mid-sized and small) Private Sidings as well as Rail logistic centres will benefit from the growth of conventional transhipment volume. In contrast,Public Sidings are not expect to share in this market development. It is likely that their numbers will remain at the level of the Trend scenario, as there is no predicted market requirement for additional public sidings.;

- The total **investment need** for new construction and upgrade of last-mile infrastructure in Europe will request some 9.7 billion EUR in the "Trend scenario" between 2015 and 2030. This means an average investment need of 20-25 Mio EUR per year and country. 46% of this total investment need is allotted to Intermodal Terminals, due to high expected growth rates in this market segment. 29% respectively 25% of the overall invest is required by Private sidings/Rail logistic centres. For Stations with public sidings, lack of market demand requires no investments (in all scenarios).
  In the "Minus 2030" scenario the investment need drops to 9 billion EUR. This decrease is mostly due to conventional facilities, whereas the investment need for Intermodal Terminals approximately remains on the same level as in the Trend scenario.
  In the "Plus 2030" scenario the investment need increases to 11.2 billion EUR overall. Compared to the Trend scenario, particularly the investments for Intermodal Terminals show a higher financial demand (+26%). For Private sidings and Rail logistic centres, the investments will be 7% higher than in the Trend scenario.

Guidelines and recommendations

Stakeholders involved in the study raised the need for two main contributions, which have been developed according to the inputs received:

- ***Guidelines***, for **Member States** and **Regions,** aiming to develop and improve technically sound and effective last-mile support programmes. In this respect, the guidelines provide an indication of which entities should be in charge(s) for the **specific LMI support programme development.** The Guidelines also include suggestions on the potential "content" ("how" to design and setting up the support programme, from the planning phase to the operational improvements), in terms of stakeholders to be involved, eligible costs, forms of support, reward mechanism, etc.;

- ***Recommendations*** mainly focused on the **governance systems** for the implementation of a **LMI Development Plan** at EU/Country/Regional level. The Recommendations aim to introduce some suggestions on the **implementation of solutions/tools** to develop the overall plan and set the specific LMI support programme(s)/project(s).

Guidelines are particularly aimed to ensure that **clear, exhaustive and effective measures are planned at all territorial levels.** These measures include in particular the following main activities.

Table 5 - Guidelines scheme

Guidelines	Measures	Main activities
Planning of Last-mile support programme	Ex-ante evaluation	To ensure always that what is proposed in the last-mile support programmes is logical and justified
	Planning process	To identify and define the goals and objectives, performance measures, strategies and alternatives, impacts and investments priorities and responsibilities
	Identifying the beneficiaries of the programme	To ensure the commitment of all stakeholders to participate pro-actively and co-operatively in the successful development and completion of the project
	Defining types of investments to be covered	To cover all the physical investments and the intangible infrastructure (e.g. ITC systems)
	Establishing minimum conditions to consider the project eligible for support	To separate the projects eligible to the support programme from those that are not
	Selecting the forms of support to be provided	To maximise the effectiveness of the support scheme
	Combining different support mechanism	To attract support from private sectors
	Tracking the outcomes	To monitor the performance of a specific programme (or a package of actions)
	Setting-up an appropriate reward mechanism	To ensure the maximum road-to-rail modal shift success both in terms of reduction of congestion and of greenhouse gas emissions.
	Ex-post evaluation	To quantify the efficiency and the effectiveness of the investment
Improvement of Last-mile support programme	Investing in innovation systems	To improve the performance of the last-mile railway infrastructure
	Making the procurement procedure more efficient	To strengthen the attractiveness of the project vis-à-vis the private sector, to encourage it to invest in the project
	Streamlining permit procedures	To reduce the administrative-related (administrative burden) risks, which in turn will ensure the financing and timely implementation of the project
	Providing assistance to project promoters	To attract, for instance, private finance through the adoption of PPP models
Monitoring	Quantitative monitoring	• To ensure comprehensive, accurate, reliable and timely data; • To support the body in charge to understand the development and the percentage of completion of the investment and eventually correct some issues
	Qualitative monitoring	• To complete and enrich all the data collected during the quantitative monitoring;

Guidelines	Measures	Main activities
		• To support the body in charge of the last-mile support programme to obtain a feedback from the main actors involved
	Statistical monitoring	• To analyse all the relevant statistical sources, at specific territorial levels (NUTS2 and NUTS3); • To evaluate the effects and the effectiveness of the adopted last-mile support programme

Recommendations are focused on **speeding up all the procedures** to support the construction & renewal of railway last miles**. Three types of support instruments** can be developed:

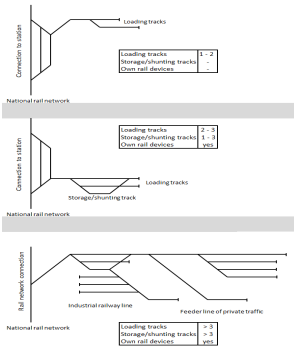
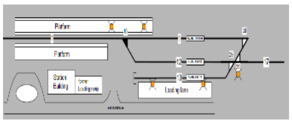
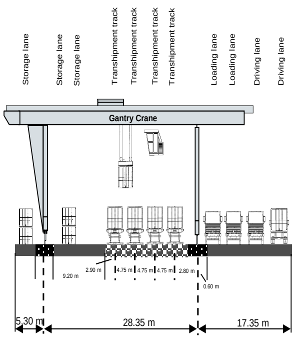
Table 6 - Recommendations for funding schemes

Support instruments	Main recommendations
Regional Last-mile support programme	Each regional supporting scheme should be defined depending on the **density of the industrial sites**, in particular for the districts located along the TEN-T corridors crossed the territory
	Each regional supporting scheme should be possibly combined with **tax incentives** (for instance, for new industrial zones that include a rail connections)
	Each pilot regional scheme should use the existing tax incentives for **attracting investments** (e.g. reducing or eliminating local taxes)
	EU co-financing
Country Last-mile support programme	Each country should encourage **co-funding programmes for the development and maintenance of private sidings** with high EU added value
	Each country should encourage **synergies between different development plans** (e.g. industrial, economic growth and railway transport system development plans) in order to support all the subjects that will contribute to an environmentally friendly increase of transport volumes carried by rail
	Countries, potentially supported by the European Commission, should also **share best practices concerning tax incentives** to attract last-mile users
	EU co-financing
EU-wide Last-mile support programme	EU should co-finance the development and maintenance of last-mile rail infrastructure through **CEF and the structural funds**
	EU should help in guiding **cross-border coordination** and contribute EU funding on cross-border projects and on those with the highest European added value
	CEF co-financing

The analysis of both the dedicated support programmes and the needs stated by the stakeholders for investments in last-mile infrastructure enabled to draft specific recommendations to be implemented according to the different schemes of the rail last-mile infrastructure. Further, specific attention was set on the potential use of the **European Fund for Strategic Investments** (EFSI) in investments on rail links to Core Network nodes.

The most appropriate financing solutions for each last-mile infrastructure type is summarised in the following table.

Table 7 - Forms of financing in last-mile infrastructures

Types of last-mile infrastructure	Layout of last-mile infrastructure	Project size	Form of financing	Description of the financing
Private sidings		Small	Non-repayable grants	• According to the three identified dedicated support instruments (Austria, Germany and Switzerland), the **minimum project threshold** is very low (from **€ 15,000 to € 28,892**); • In Austria and Germany, the **maximum project threshold** is based on the type of intervention (e.g. in Austria new construction of sidings is financing by **€ 2.5 million** while in Germany is **€ 8 per additional tonne/year or € 32 per additional 1,000 tonne-km/year**. On the contrary, the extensions/renewal of sidings is financing by **€ 2 million** in Austria and **€ 6 per additional tonne/year or € 24 per additional 1,000 tonne-km/year** in Germany.
Freight station		Medium	Non-repayable grants	• The infrastructure manager is responsible to coordinate the investments (through different investment projects) in rail last-mile infrastructure
Rail-Road terminals/Ports		Large	European Fund for Strategic Investments	• The European Fund for Strategic Investments (EFSI) **should co-finance the development and maintenance of rail last-mile infrastructure to Core network nodes** (rail-road terminals/ports); • Since EFSI guarantee is portfolio-based, it covers hundreds of projects. This means that **the EFSI instrument can be used, in particular, to finance cross-border projects both at EU and Country/Regional levels**.

Conclusions

Based on the analysis performed on collected data as well as on the contribution provided by stakeholders, the authors of the study **“Design features for support programmes for investments in last-mile infrastructure”** conclude that:

- There is a **need for investments** in last-mile infrastructure of about **9.7 billion EUR** for the period 2015-2030. 46% of this total investment need is allotted to Intermodal Terminals, due to high expected growth rates in this market segment. Private sidings and Rail logistic centers require 29% and 25% of the overall investment respectively.
- **Last-mile infrastructure** and rail freight production systems will undergo **further concentration**: large facilities will be used more extensively than today and provide higher volumes; in contrast, small and partially also middle sized facilities will be abandoned or served to a lesser extent. In consequence, the **total number of rail access points in Europe will decrease**, even under favourable framework conditions for rail freight.
- In order to cope with the forecasted volume growth of intermodal transport**, the capacity of the existing terminals shall be increased**.
- It is paramount to **drive investments with dedicated support programmes.** Dedicated instruments in Austria, Germany, and Switzerland achieved a success rate close to 100%. In these countries, **the investments in last-mile infrastructure** (new construction, extension/modernisation and reactivation of sidings) **are considered a great opportunity** to promote the growth of the railway freight transport and facilitate modal shift from road to rail.
- The scope of the programmes shall be properly defined according to preliminary identified and assessed priorities (e.g. corridor, states, regions, new last-mile link and/or renewals, infrastructure and/or ICT);
- **Dedicated programmes appear to be more suitable in achieving last-mile development than non-dedicated ones,** both in terms of effectiveness (e.g. transported rail freight volumes and capacity of the railway infrastructure) and efficiency (dedicated programmes enable a more rational use of financial resources, by concentrating them only on last-mile infrastructure projects and ensuring a greater impact).
- The adoption of **dedicated support instruments for investments in last-mile infrastructure** is in line with the objectives of the White Paper, prepared by EC. In particular, one of the main goals of the Paper is the **optimization of the performance of multimodal logistic chains**, which includes a greater use of inherently more resource-efficient modes.
- **It is necessary to diversify financial support instruments involving both public and private capital.** This would contribute to consolidate and develop the freight market/demand within the area of investment.
- **Better coordination between the Cohesion and Structural Funds with transport policy objectives** would reduce the risk of overlapping with the programmes at country level.
- **Member States need to ensure that sufficient national funding**, as well as sufficient project planning and implementation capacities, **is available in their budgetary planning**.
- **The reduction of administrative burden** (e.g. lighter norms, standards and operational rules to access to a siding and operate it) is necessary to unlock the potential for private finances being invested in last-mile infrastructure;
- **It is deemed important to list all last-mile infrastructure in the National Network Statements in a harmonised structure and understanding. This structure and understanding could be according to the four main categories of last-mile infrastructure as developed within this study: Private sidings, Public sidings, Rail logistic centres and Intermodal Terminals.** Indeed, this would be an important signal to the railway freight market – raising awareness on which facilities should be open to applicants under non-discriminatory conditions – to optimize their use and share costs.
- **An effectiveness-based reward mechanism should be set up**. The *differentiated track access charges*, for instance, is a performance-based instrument involving the infrastructure manager and the railway undertakings by which the railway undertakings receive a discount on the track access charge in case they reach specific levels of performance (e.g. train-kilometre). Another possible instrument is

represented by *subsidies,* by which the Member State provides financial support to the owner of the siding that builds a railway link, or to the railway undertaking that transports freight along specific railway link. Finally, the *tax incentives* are available to operators applying desidered initiatives such as environmentally friendly solutions.

Taking into consideration the complexity of the rail freight market and the need for investments in the rail last-mile infrastructure, the following additional recommendations are presented, as elaborated on stakeholders' inputs. These recommendations specifically refer to the development of a comprehensive political and regulatory approach on the handling of the measures adopted to support investments:

- **providing guidelines** (similar to those on State Aid to railway undertakings), would facilitate the promotion of dedicated last-mile programmes. Similarly, the dissemination of best practices and success stories would be positively welcomed, e.g. during sectorial events (TEN-T days, EU Rail Freight Days, etc.);
- **verifying the conditions ensuring that dedicated programmes meet State Aid regulation's prescriptions** and provide guidance on how to obtain clearance at programme level (not at project level);
- **considering earmarking of specific funds** under CEF and Cohesion Funds to co-fund Regional and Country dedicated last-mile programmes, to be chosen following a competitive approach (call) aimed to select the most promising proposals, which would result in higher benefits;
- **supporting and monitoring the development of last-mile infrastructure along Core Network Corridors/RFCs,** coherently with the existing regulatory framework (e.g. Core Network Corridor, RFC management bodies and committees).

Kurzfassung

Ausgangssituation und Zielsetzung

Während der vergangenen Jahre haben die **Europäische Kommission und ihre Mitgliedsländer** erhebliche Anstrengungen unternommen, um Infrastruktur entland der paneuropäische **Korridore für den Schienengüterverkehr** („Rail Freight Corridors") zuerrichten. Diese Korridore sollen das Rückgrat für den umweltfreundlichen und effizienten Transport großer, konsolidierter Güterströme bilden, wobei der Nutzung multimodaler Transportketten und dem Einsatz innovativer Techniken eine besondere Bedeutung beigemessen wird.

Die Hauptaufgaben bei der Vervollständigung der dazu benötigten Schieneninfrastruktur liegen in der **Beseitigung von Engpässen** (insbesondere in Knoten und an Grenzübergängen) sowie in der **Steigerung der Leistungsfähigkeit**. Dies betrifft nicht nur die Kapazität auf dem (Fernstrecken-)Netz, sondern auch die Zugangspunkte zum Schienengüterverkehr und ihre Zulaufstrecken (= „letzte Meile"). Ein **bedarfsgerechter Ausbau** von Umschlagkapazitäten und Gleisanlagen auf der **letzten Meile** ist daher **unverzichtbar**.

In diesem Zusammenhang gilt es auch und insbesondere die Anforderungen des Einzelwagenverkehrs (EWV) zu berücksichtigen. Wie bereits im Jahr 2014 in einer Studie für die Europäische Kommission[7] ermittelt wurde, betreffen diese einzelwagenspezifischen Aspekte vor allem

- einen Mengenrückgang insbesondere bei solchen Güterarten, die in der Vergangenheit eine hohe Affinität zum Einzelwagenverkehr aufwiesen,
- hohe Stückkosten im infrastrukturellen und operativen Bereich,
- **fehlende Investitionen in Privatgleisanschlüsse**, deren Infrastruktur vielfach ein hohes Alter erreicht hat (teilweise 50 Jahre und mehr).

Vor diesem Hintergrund hat die Europäische Kommission die vorliegende **Studie zur Evaluierung von Förderprogrammen für die Infrastruktur der letzten Meile** vergeben. Der Schlussbericht wurde der Kommission im Juni 2016 übergeben. Die wichtigsten Ergebnisse werden nachfolgend zusammengefasst; sie decken folgende Zielsetzungen ab:

- Identifikation und Analyse von **Förderprogrammen**, welche **unmittelbar auf die letzte Meile** im Schienengüterverkehr in den Ländern der EU abzielen;
- Identifikation und Analyse **weiterer Programme**, die zwar nicht unmittelbar auf die Infrastruktur der letzten Meile ausgerichtet sind, die jedoch einen flankierenden Fördereffekt ausüben können;
- Ermittlung des **zukünftigen Infrastruktur- und Investitionsbedarfs** für die letzte Meile in den Ländern der EU.
- Erarbeitung von **Handlungsempfehlungen zur Entwicklung eines Förderinstrumentariums** für die letzte Meile im Schienengüterverkehr auf EU-Ebene;

Wesentliche Grundlage für die Erarbeitung der Studienergebnisse waren eine **Befragung von mehr als 800 Marktteilnehmern** (insbesondere Infrastrukturbetreiber, Logistik- und Transportanbieter, Industrieverbände, Hafenverwaltungen) sowie ein **kontinuierlicher Informationsaustausch mit den Mitgliedsstaaten**.

[7] Study on Single Wagonload traffic in Europe – challenges, prospects and policy options, PwC, 2014

Infrastruktur der letzten Meile – Definition und Ausprägungsformen

Im Unterschied zum allgemeinen Verständnis bezieht sich der Begriff der „Letzten Meile“ im Rahmen dieser Studie nicht auf den ersten bzw. letzten Abschnitt der gesamten Transportkette, sondern auf den **ersten bzw. letzten Abschnitt des Eisenbahntransports**. Dieser umfasst die Ladestelle selbst und erstreckt sich bis zur Anbindung an das Eisenbahnnetz für den Ferntransport, schließt also einen ggf. vorhandenen Übergabebahnhof ebenso ein wie den Streckenabschnitt, der zwischen Übergabebahnhof und Ladestelle liegt[8]. Aus Sicht des Eisenbahnbetriebs wird die „letzte Meile“ durch denjenigen Punkt begrenzt, an welchem eine Zug- in eine Rangierfahrt übergeht (bzw. umgekehrt).

Die Infrastruktur der letzten Meile zeichnet sich durch eine **große Vielfalt möglicher Ausprägungsformen** aus – in Bezug auf Infrastruktur (Layout), Betrieb, Einbindung in Produktionssysteme sowie heutige und zukünftige Relevanz und damit auch **bezüglich ihres Investitionsbedarfs**. Dies wurde durch die Unterscheidung von **vier Letzte-Meile-Typen** berücksichtigt, die insgesamt **sämtliche Zugangspunkte zum Schienengüterverkehr** abdecken:

- **Privatgleisanschlüsse** sind private und (grundsätzlich) für eigene Zwecke betriebene Gleisanlagen. Derartige Anlagen sind in der Regel stark auf die individuellen Bedürfnisse und logistischen Rahmenbedingungen des jeweiligen Unternehmens - zumeist des produzierenden Gewerbes - zugeschnitten.
- **Öffentliche Ladegleise** waren früher in nahezu jedem Bahnhof vorhanden und bildeten den Zugangspunkt zum Schienengüterverkehr „für jedermann“. Ihre Zahl und Bedeutung hat mittlerweile stark abgenommen. Sie bestehen aus Freilade- und Rampengleisen und dienen dem konventionellen Transport.
- **Terminals des kombinierten Verkehrs** sind Umschlagstellen für genormte Ladeeinheiten (Container, Wechselbehälter, Sattelanhänger) zwischen mindestens zwei Verkehrsträgern. Die Mehrzahl von ihnen ist öffentlich zugänglich. Im Rahmen dieser Studie werden nur Terminals mit Schienenanbindung bzw.
-umschlag berücksichtigt.
- **Bahn-Logistikzentren** sind Umschlagpunkte sowohl für den konventionellen als auch für den intermodalen Transport, ergänzt durch zusätzliche Dienstleistungen wie Lagerung, Kommissionierung, Organisation des Vor-/Nachlauf etc. Diese Form des Zugangs zum Schienengüterkehr ist auch unter dem Begriff „Railport“ bekannt; hierbei handelt es sich um eine Produktbezeichnung von DB Cargo. In der vorliegenden Studie wird dieser Begriff im Sinne des beschriebenen Funktionsspektrums verwendet.

[8] Sidings & last miles – EU point of view. House of Rail conference on “Sidings & last miles” Brussels, 28 November 2008. http://www.erfarail.eu/uploads/pageImages/working_issues/house%20of%20rail/EU_DG_TREN_MCastelletti_28_11_08.pdf

Identifikation und Analyse von Förderprogrammen mit Bezug zur Infrastruktur der letzten Meile

Befragung von Marktteilnehmern

Im Rahmen dieser Studie wurde eine breit angelegte Befragung von Marktteilnehmern durchgeführt, die sich in zwei Phasen gliederte:

- Die erste Phase zielte darauf ab, Informationen über die **Nutzung derzeit laufender Förderprogramme** zu sammeln. Sie wurde als offene Befragung (Fragebogen) durchgeführt und durch Interviews mit ausgewählten Marktteilnehmern ergänzt.
- In der zweiten Phase wurden die Marktteilnehmer nach **erforderlichen und beabsichtigten Investitionen** in die Infrastruktur der letzten Meile befragt.

In den Interviews betonten die **Mitgliedsstaaten** vor allem die

- Notwendigkeit, intermodale Terminals sowie Rangierbahnhöfe und Grenzbahnhöfe stärker zu berücksichtigen;
- Wichtigkeit, Förderung auf Innovationen zu beschränken (z.B. IT-Systeme).

Von anderen Marktteilnehmern wurden insbesondere die folgenden Aspekte hervorgehoben:

- Stärkeres **Einbeziehen regionaler Gebietskörperschaften** bei der Bildung landesweiter Transportströme (italienischer Eisenbahn-Infrastrukturbetreiber);
- **Weniger bürokratischer Aufwand** bei der Einrichtung neuer Zugangspunkte zur letzten Meile (italienischer Eisenbahn-Infrastrukturbetreiber);
- Implementierung eines **verkehrsträgerübergreifenden Kapazitätsmanagementsystems** zur Steuerung von Verkehren (italienischer Eisenbahn-Infrastrukturbetreiber);
- **Erweiterung der Förderfähigkeit** auf Kosten für Grunderwerb (Infraestruturas de Portugal, S.A);
- Verstärkte **Kooperation der verschiedenen Betreiber** von Infrastruktur der letzten Meile und **Abstimmung** von Ausbauplänen (italienischer Eisenbahn-Infrastrukturbetreiber);
- **Bessere Informationen** über Fördermöglichkeiten und –verfahren (deutsche Eisenbahnen und Verband der Binnenhäfen).

Darüber hinaus wurde seitens mehrerer Anbieter von Schienentransportleistungen und Hafen-Terminalbetreibern die Notwendigkeit betont,

- die Bahnsysteme im Hafen und auf dem Fernstreckennetz **besser aufeinander abzustimmen**;
- **Prozesse zu vereinfachen** und zu digitalisieren, um bei der Bildung von Transportketten wettbewerbsfähig zu bleiben;
- die existierenden **finanziellen Anreize** kritisch zu **überprüfen**;
- die **Gleise** der Terminals in den Häfen zu **verlängern**.

Spezifische Förderprogramme für Gleisanschlüsse in der EU

Derzeit existiert eine große Anzahl von Möglichkeiten, Infrastruktur für den Güterverkehr in Europa zu fördern, wobei der Rahmen von allgemeinen bis zu gezielten Zuwendungen reicht. Allerdings haben bisher nur **wenige Länder Programme aufgesetzt, die sich speziell auf Gleisanschlüsse beziehen**. Solch spezifische Programme können grundsätzlich auf Länder-, Regions- oder Kommunalebene angesiedelt sein; sie müssen jedoch **bewusst auf den Neubau, den Ausbau, die Reaktivierung oder die Instandhaltung von Gleisanschlüssen abzielen**. In einem weiter gefassten Begriffsverständnis können **auch solche Programme** einbezogen werden, deren Budget nur **zum Teil diesem Zweck gewidmet** ist (z.B. Förderung einer Investition, die einen definierten Mindestanteil für Gleisanschlüsse vorsieht).

Spezifische Förderprogramme für Gleisanschlüsse sind in **drei Ländern in Europa bekannt**:

- **Österreich** (*Programm für die Unterstützung des Ausbaues von Anschlussbahnen*);
- **Deutschland** (*Richtlinie zur Förderung des Neu- und Ausbaus sowie der Reaktivierung von privaten Gleisanschlüssen*);
- **Schweiz** (*Aides financières pour voies de raccordement*).

Die wichtigsten Parameter dieser Förderprogramme sind der **maximale Förderanteil**, die **Anforderungen** für den Erhalt von Fördermitteln sowie die **Form der Zuwendung.** Wie Tabelle 1 zeigt,

- liegt der Förderanteil bei Maßnahmen zum Neu- oder Ausbau bzw. zur Reaktivierung von Gleisanschlüssen zwischen **25 und 50% in Österreich**, zwischen **40 und 60% in der Schweiz** und erreicht **maximal 50% in Deutschland**;
- sehen die Förderrichtlinien in **Österreich und Deutschland dieselbe Mindestgrenze** für Förderprojekte vor **(jeweils 15.000 €);** in der **Schweiz liegt dieser Wert fast doppelt so hoch**;
- unterscheiden die Förderrichtlinien in **Österreich und Deutschland, nicht aber die der Schweiz** zwischen Neu- und Ausbau von Gleisanschlüssen bei der **Bemessung des maximalen Förderbetrags**:
  - In **Österreich** liegt dieser Betrag bei 2,5 Mio. € für Neu- und bei 2 Mio. € bei Ausbaumaßnahmen.
  - In **Deutschland** ist der Förderbetrag aufkommensabhängig: Bei Neubaumaßnahmen beträgt er 8 € pro Tonne bzw. 32 € pro 1.000 Tonnenkilometer, die infolge der Maßnahme jährlich zusätzlich auf bzw. von der Schiene umgeschlagen werden. Bei Ausbaumaßnahmen reduzieren sich diese Werte auf 6 € bzw. 24 €;
  - Die **Schweiz** sieht eine Obergrenze von 29 € je im Gleisanschluss umgeschlagene Tonne pro Jahr bzw. von 4.235 € pro Meter für Stammgleise vor.
- wird die Förderung grundsätzlich in Form **nicht-rückzahlbarer Zuschüsse** gewährt, solange die Verpflichtungen zur modalen Verlagerung eingehalten werden. Finanzhilfen über Kredite oder Public-Private-Partnership-Konstruktionen sind dagegen nicht vorgesehen.

Tabelle 1 – Wichtige Parameter von Gleisanschlussförderprogrammen in Europa

Land	Anteil förderfähiger Kosten	Mindest-Projekt-volumen	Maximaler Förderbetrag		Form der Mittel-zuwendung
			für Neubau	für Ausbau	
Österreich	25% - 50%	15.000 €	2,5 Mio. € je Maßnahme	2 Mio. € je Maßnahme	Nicht-rückzahlbare Zuschüsse
Deutschland	Bis zu 50%	15.000 €	8 € pro jährlich zusätzlicher [t] oder 32 € pro jährlich zusätzlichen [1.000 tkm]	6 € pro jährlich zusätzlicher [t] oder 24 € pro jährlich zusätzlichen [1.000 tkm]	Nicht-rückzahlbare Zuschüsse
Schweiz	40% - 60%	28.892 €	29 € (30 Schweizer Franken) pro [t], die im Gleisanschluss jährlich umgeschlagen wird 4.235 € (4.400 Schweizer Franken) pro Meter Stammgleis		Nicht-rückzahlbare Zuschüsse

In den genannten Ländern haben diese **Förderprogramme entscheidend zum Mengenwachstum** im Schienengüterverkehr **beigetragen**. So betrug die jährliche Steigerungsrate der Transportleistung im Schienengüterverkehr in Österreich, Deutschland und in der Schweiz zwischen 2009 und 2014 im Mittel 3,1% im Vergleich zu 1,8% für den gesamten EU-28-Raum.

Weitere zentrale Ergebnisse der Analyse der Gleisanschluss-Förderprogramme in Österreich, Deutschland und in der Schweiz sind:

- Zuwendungsempfänger in **Österreich und in Deutschland sind Privatunternehmen**, während in der **Schweiz auch öffentliche Körperschaften** von den Förderinstrumentarien Gebrauch machen können. Hierzu muss sich das jeweilige Projekt auf ein (öffentliches) Stammgleis beziehen, an welches wiederum mehrere Privatgleisanschlüsse angebunden sind;

- In **Deutschland und in der Schweiz ist die Höhe der Zuwendungen abhängig von dem Aufkommen**, welches über die Gleisanschlüsse von der Straße verlagert bzw. zusätzlich generiert wird. In **Österreich** wird dagegen lediglich die **Höhe der förderbaren Kosten** mit dem entsprechenden Fördersatz multipliziert.
- Die gewährten **Förderungen** sind grundsätzlich teilweise oder ganz **zurückzuzahlen**, falls das jeweilige Mengenziel (Umschlag/Verlagerung) nicht erreicht wird.
- In den drei genannten Ländern liegt die **Erfolgsquote** – also das Verhältnis von bewilligten zu eingereichten Förderanträgen - **bei nahezu 100%;**
- Die regelmäßig durchgeführten Evaluierungen des **deutschen Gleisanschluss-Förderprogramms** haben gezeigt, dass hierdurch eine **erhebliche modale Verlagerung** von Güterverkehren von der Straße auf die Schiene evoziert wurde. Zwischen 2004 und 2010 konnte die Anzahl der jährlichen Lkw-Fahrten dadurch um 450 Mio. reduziert werden, was zu einer **Einsparung von** 10 Mio. t/a an **Treibhausgasemissionen** führte. Auch in wirtschaftlicher Hinsicht war das Programm ein Erfolg: Mit einem Fördervolumen von ca. 48 Mio. € wurden Gesamtinvestitionen von 130 Mio. € ausgelöst. Der **volkswirtschaftliche Nutzen** des Förderprogramms aus Verlagerungseffekten, CO2 Einsparungen und Beschäftigungswirkungen beträgt **25,5 € pro Euro Förderung**.
- Im Vergleich zu den „allgemeinen" Infrastrukturprogrammen (s. unten) erscheinen die **spezifischen Förderprogramme geeigneter**, um einen effizienten Ausbau von Infrastruktur der letzten Meile mit entsprechenden Mengeneffekten zu gewährleisten.

Allgemeine Infrastruktur-Förderprogramme und –instrumentarien auf EU- und Länderebene

Die Analyse der allgemeinen Infrastrukturförderinstrumentarien umfasste mehr als **70 Programme**, von denen die meisten (62) auf Länderebene und zehn weitere auf EU-Ebene angesiedelt sind. In Bezug auf das Thema „letzte Meile" sind sie in drei Kategorien unterteilt worden, nämlich **Programme mit hoher (HR), mittlerer (MR) und niedriger (NR) Relevanz** (vgl. Abbildung 1).

Abbildung 1 - Allgemeine Infrastrukturförderprogramme auf EU- und Länderebene

EU-Ebene

Zeitraum: 2014 - 2020 (oder später)

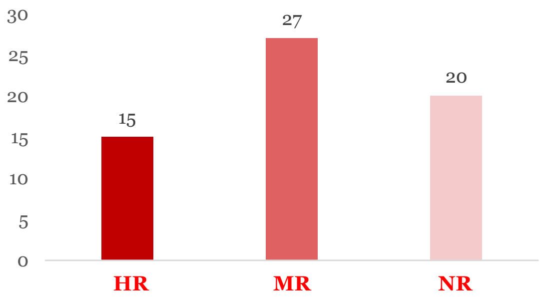
HR	Connecting Europe Facility (CEF)	26,2 Mrd. €
HR	Europäischer Fonds für regionale Entwicklung (EFRE) (Transport)	25,6 Mrd. €
HR	Kohäsionsfonds (Transport)	10,0 Mrd. €
HR	TEN-T Programm	8,1 Mrd. €
HR	Marco Polo II (2007-2013)	0,45 Mrd. €
HR	Shift2Rail	0,92 Mrd. €
MR	Marguerite Fonds	0,71 Mrd. €
MR	Europäische Bank für Wiederaufbau und Entwicklung (EBWE)	10,0 Mrd. €*
MR	Europäische Investitionsbank LGTT	1,0 Mrd. €
MR	Europäische Investitionsbank SFF	3,75 Mrd. €

* Infrastrukturprojekte zwischen 1992 und 2012

Länderebene

10 EU-Mitgliedsstaaten haben (oder hatten) nationale Förderprogramme eingesetzt.

Anzahl allgemeiner Förderprogramme auf Länderebene



HR: Deutschland (1), Italien (1), Litauen (1), Niederlande (3), Österreich (1), Polen (3), Rumänien (1), Slowakei (1), Slowenien (1), Tschechien (1), Ungarn (1)

Niedrige Relevanz (NR): Programme und Instrumentarien, die nicht oder nur zu geringen Teilen auf Güterverkehr und entsprechende Infrastruktur ausgerichtet sind

Mittlere Relevanz (MR): Programme und Instrumentarien, die zwar auf den Güterverkehr im allgemeinen, nicht jedoch auf Infrastruktur der letzten Meile ausgerichtet sind

Hohe Relevanz (HR): Programme und Instrumentarien, die speziell auf den Güterverkehr und hierbei insbesondere auf Eisenbahninfrastruktur ausgerichtet sind

Die wichtigsten Merkmale dieser Programme sind in Tabelle 2 zusammengefasst.

Tabelle 2 – Überblick über allgemeine Infrastrukturförderprogramme

Allgemeine Infrastruktur-förderprogramme	Wichtigste Ergebnisse
Infrastrukturförder-programme auf EU-Ebene	• Sechs EU-Programme wurden als besonders relevant für die Infrastruktur der letzten Meile eingestuft: **Shift2Rail, CEF, TEN-T, Europäischer Fonds für regionale Entwicklung (EFRE), Kohäsionsfonds und Marco Polo II**; • Die meisten der EU-Programme zielen auf **Infrastrukturförderung** ab (TEN-T, CEF, EFRE, Kohäsionsfonds, Marguerite Fonds, EBWE, EIB), während andere Instrumentarien **Betrieb und Infrastruktur** (Marco Polo II) bzw. **Forschung und Entwicklung** fördern (Shift2Rail); • Die meisten der analysierten Programme gewähren **nicht-rückzahlbare Zuschüsse**; • Viele Programme (TEN-T, ESIF, Marco Polo II) wenden sich an **unterschiedliche Zuwendungsempfänger**: Infrastrukturbetreiber, regionale Gebietskörperschaften, internationale Organisationen, Privatunternehmen oder Public-Private-Partnerschaften.
Infrastrukturförder-programme auf Länderebene	• Insgesamt **23 EU-Länder bieten Förderprogramme** für Schieneninfrastruktur an; • Von diesen 23 Ländern haben **zehn Länder eigene, nationale Förderprogramme**[9], **während 13 Länder die Möglichkeit der Kofinanzierung** für Infrastruktur der letzten Meile anbieten[10]; • **Anreize** zur Entwicklung von Infrastruktur der letzten Meile werden **überwiegend in Form von finanziellen Zuschüssen, aber auch von Krediten und Bürgschaften gesetzt**. In selteneren Fällen werden auch andere Instrumentarien, wie Konzessionen oder steuerliche Vergünstigungen, eingesetzt; • Die angesprochenen möglichen Zuwendungsempfänger unterscheiden sich nicht wesentlich in den einzelnen Ländern.

Insgesamt erscheint ein erheblicher Anteil der hier untersuchten Programme geeignet, die weitere Entwicklung von Infrastruktur der letzten Meile zu unterstützen.

Letzte Meile-Infrastruktur- und Investitionsbedarf in der EU

Gegenwärtig existieren rund **22.120 Zugangspunkte zum Schienengüterverkehr in Europa**[11] (Stand Herbst 2015). Der weitaus **größte Teil davon entfällt auf Privatgleisanschlüsse** (~ 15.600), gefolgt von Bahnhöfen mit öffentlichen Ladegleisen (~ 5.600), Terminals des kombinierten Verkehrs (~ 730, nur Anlagen mit Bahnanschluss) und Bahn-Logistikzentren (~ 190). Für den Güterverkehrsmarkt und dessen zukünftige Entwicklung haben diese Ausprägungsformen von Infrastruktur der letzten Meile sehr unterschiedliche Bedeutung (s. Tabelle 3).

Tabelle 3 – Letzte Meile-Infrastrukturtypen und ihre Bedeutung für den Güterverkehrsmarkt

Infrastrukturtyp	Bedeutung für den Güterverkehrsmarkt
Privatgleisanschlüsse	**Während der vergangenen Jahre hat die Anzahl an Privatgleisanschlüssen deutlich abgenommen.** Von dieser Abnahme waren insbesondere kleine und mittlere Anlagen betroffen. Für die **Zukunft wird eine Fortsetzung dieses Konzentrationsprozesses** erwartet: Große Privatgleisanschlüsse werden erhalten bleiben und ihr Aufkommen tendenziell steigern. Demgegenüber werden Anschlüsse mit niedrigem Aufkommen kaum noch bedient werden. Ein Teil des Aufkommens dieser stillgelegten Gleisanschlüsse wird durch Bahn-Logistikzentren aufgefangen werden. Insgesamt wird die **Anzahl an Privatgleisanschlüssen in Europa weiter abnehmen**.
Bahnhöfe mit öffentlichen Ladegleisen	**Öffentliche Ladegleise** haben in der Vergangenheit stark an Bedeutung verloren. Die meisten der noch existierenden Gleise werden heute nicht mehr oder nur noch sporadisch bedient. Abgesehen von wenigen Marktnischen (z.B. Holztransporte) werden sie **in Zukunft keine Rolle mehr spielen**. Bahn-Logistikzentren (Railports) werden ihre Funktion als "allgemeiner Zugang" zum Schienengüterverkehr übernehmen.

[9] Österreich, Dänemark, Frankreich, Deutschland, Irland, Italien, Niederlande, Polen, Spanien, Großbritannien
[10] Bulgarien, Kroatien, Tschechien, Estland, Finnland, Griechenland, Ungarn, Lettland, Litauen, Rumänien, Slowakei, Slowenien, Schweden
[11] EU-28 plus Schweiz und Norwegen

Infrastrukturtyp	Bedeutung für den Güterverkehrsmarkt
Bahn-Logistikzentren (Railports)	**Bahn-Logistikzentren (Railports)** sind darauf ausgelegt, **Aufkommen stillgelegter Privatgleisanschlüsse und öffentlicher Ladegleise (teilweise) aufzufangen**. Gleichzeitig entsprechen sie durch ihren **multifunktionalen Ansatz** den logistischen Anforderungen der verladenden Wirtschaft. Es wird damit gerechnet, dass ihre **Anzahl deutlich zunehmen** wird, vor allem in denjenigen Ländern, in denen der Einzelwagenverkehr aufgegeben oder stark eingeschränkt wird.
Terminals des kombinierten Verkehrs (mit Bahnanschluss)	Viele existierende **Terminals des kombinierten Verkehrs arbeiten heute bereits an ihrer Kapazitätsgrenze** oder werden diese in Zukunft erreichen. Da Terminalneubauten insbesondere in wirtschaftlichen Agglomerationsräumen schwierig zu realisieren sind, werden die prognostizierten **Aufkommenszuwächse vorwiegend** über eine **Modernisierung bzw. einen Ausbau** vorhandener Anlagen realisiert werden. Infolge dessen wird eine nur **moderate Zunahme** der Anzahl von KV-Terminals erwartet.

Wesentliche Rahmenbedingen (Liberalisierung der Verkehrsmärkte, Gutart- und Logistikeffekt etc.) haben in den vergangenen Jahren tendenziell den Straßen- gegenüber dem Schienengüterverkehr begünstigt. Dies hat dazu geführt, dass in der EU nur noch rund **10% des Güteraufkommens [t] per Bahn** transportiert wird.

Innerhalb des Schienengüterverkehrsmarktes **dominiert immer noch der konventionelle Transport** (Ganzzüge, Wagengruppen- und Einzelwagenverkehr) mit mehr als 80% des Aufkommens gegenüber dem intermodalen Verkehr, der allerdings starke Zuwachsraten aufweist. Der konventionelle Schienengüterverkehr wiederum wird von **Kernbranchen** (vor allem Energie, Stahl, Automobil, Chemie) dominiert, die zusammen etwa zwei Drittel des Aufkommens im konventionellen Marktbereich repräsentieren.

Aufgrund ihrer spezifischen logistischen Anforderungen haben insbesondere die **Stahl-, Chemie und Automobilbranche großen Einfluss auf die infrastrukturelle Gestaltung und den Betrieb von Privatgleisanschlüssen**. Zwischen diesen logistischen Randbedingungen und den Produktionssystemen im Schienen(fern)verkehr bestehen starke, **wechselseitige Abhängigkeiten, welche durch die infrastrukturelle Ausbildung und die betrieblichen Prozesse auf der letzten Meile aufeinander abgestimmt** werden müssen.

Zur Abschätzung des zukünftigen (Zeithorizont 2030) **Schienengüterverkehrsaufkommens sowie des daraus abgeleiteten Infrastruktur- und Investitionsbedarfs** auf der letzten Meile hat **HaCon ein Modell entwickelt**, welches folgende Hauptparameter berücksichtigt:

- **Vier unterschiedliche Typen von Infrastruktur** der letzten Meile (Privatgleisanschlüsse, Bahnhöfe mit öffentlichen Ladegleisen, Bahn-Logistikzentren (Railports) und Terminals des kombinierten Verkehrs);
- **Zukünftige wirtschaftliche Entwicklung in europäischen Ländern** (Unterscheidung von vier „Länderclustern“) mit den entsprechenden Folgen für die Bedeutung der Letzte-Meile-Infrastrukturtypen und ihre Einbindung in Schienenproduktionssysteme;
- **Technische Innovationen**, die für den Betrieb auf der letzten Meile von besonderer Relevanz sind (z.B. Lokomotiven mit Hybridantrieb, standardisierte Wagen);
- **Politische Rahmenbedingungen**, die Einfluss auf die Wettbewerbsfähigkeit des Schienengüterverkehrs und letztlich auf den Kostendruck im Schienengüterverkehrsmarkt nehmen.

Variationen dieser Parameter wurden in **drei Szenarien gebündelt („Trend“, „Minus“, „Plus“)**, deren aggregierte Rahmenbedingungen und Ergebnisse in

Tabelle 4 zusammengefasst sind.

Tabelle 4 – Modellszenarien mit aggregierten Randbedingungen und Ergebnissen für EU-28+2

Szenario	Annahmen für die Entwicklung der Infrastruktur der letzten Meile	Entwicklung des Bahn-Umschlag-aufkommens [t] gegenüber 2010	Entwicklung der Anzahl von Zugangspunkten zum Schienengüter-verkehr insgesamt gegenüber 2015	Investitionsbedarf für Infrastruktur der letzten Meile 2015-2030
„Trend 2030"	Fortschreibung derzeitig erkennbarer Tendenzen (i.e. Aufkommenszuwächse bei großen Anlagen, Stilllegung kleiner und teilweise auch mittlerer Anschlüsse; öffentliche Ladegleise verlieren weiter an Bedeutung; Bahn-Logistikzentren werden stillgelegte private und öffentliche Anschlüsse (teilweise) ersetzen; Aufkommenszuwächse im kombinierten Verkehr werden vorwiegend über Ausbau/ Modernisierung vorhandener Anlagen abgedeckt).	+19%	-27%	9,7 Mrd. €
„Minus 2030"	Im Vergleich zum Trendszenario ungünstigere Rahmenbedingungen für den Schienengüterverkehr führen zu einer Verstärkung der Konzentration auf große Anlagen (vor allem bei Privatgleisanschlüssen) und einer Aufgabe nahezu aller kleinen und zahlreicher mittlerer Gleisanschlüsse; öffentliche Ladegleise haben allenfalls noch Nischenfunktionen. Für Terminals des kombinierten Verkehrs gelten im Wesentlichen dieselben Rahmenbedingungen wie im Trendszenario.	-2%	-49%	8,9 Mrd. €
„Plus 2030"	Im Vergleich zum Trendszenario günstigere Rahmenbedingungen für den Schienengüterverkehr führen dazu, dass mehr mittlere und teilweise auch kleine Privatgleisanschlüsse erhalten bleiben. Gleichwohl setzt sich der Konzentrationsprozess fort, allerdings in leicht abgeschwächter Form. Für Terminals des kombinierten Verkehrs gelten im Wesentlichen dieselben Rahmenbedingungen wie im Trendszenario.	+28%	-20%	11,2 Mrd. €

Die wichtigsten Ergebnisse der Modellrechnungen sind:

- Das Bahn-**Umschlagaufkommen** in Europa (EU 28+2) betrug im Jahre 2010 rund 2.488 Mio. t; davon entfielen 89% auf konventionelle und 11% auf intermodale Zugangspunkte zum Schienengüterverkehr. Für das Trendszenario 2030 wird mit einer Zunahme auf 2.958 Mio. t gerechnet, was einem Zuwachs von 19% gegenüber 2010 entspricht. Dieser Zuwachs entfällt ganz überwiegend auf KV-Terminals (+89%) im Vergleich zu +10% bei Zugangspunkten des konventionellen Schienengüterverkehrs.

  Für das Minusszenario 2030 wird davon ausgegangen, dass die ungünstigeren Rahmenbedingungen zu einem Rückgang des Umschlagaufkommens um 20% beim konventionellen und um 5% beim intermodalen Transport führen werden. Insgesamt reduziert sich das Bahn-Umschlagaufkommen in Europa damit auf 2.446 Mio. t, mithin um 17% gegenüber dem Trendszenario und um 2% im Vergleich zum Basisjahr 2010.

Im Plusszenario 2030 dagegen wird angenommen, dass sich das günstigere Umfeld für den Schienengüterverkehr positiv auf die Bahn-Umschlagmengen auswirkt. Es wird hier mit einer Gesamtzunahme auf 3,185 Mio. t gerechnet, also einem Zuwachs von 8% gegenüber dem Trendszenario und um 28% gegenüber dem Basisjahr 2010.

- Diese Aufkommensentwicklung wird zusammen mit den absehbaren Trends (vgl.
-
- Tabelle 4) dazu führen, dass die **Anzahl der Zugangspunkte zum Schienengüterverkehr** in Europa von 22.120 im Jahr 2015 auf rund 16.200 im Trendszenario 2030 abnimmt (-27%). Maßgeblich für diese Entwicklung ist der Rückgang bei öffentlichen Ladegleisen (-59%) und bei (vor allem kleinen und mittleren) Privatgleisanschlüssen (-19%). Demgegenüber wird die Anzahl an KV-Terminals (+5%) und vor allem an Bahn-Logistikzentren (+173%) zunehmen.

  Im Minusszenario 2030 wird sich die Anzahl der Zugangspunkte in Europa gegenüber 2015 auf etwa 11.300 nahezu halbieren. Dies entspricht einem Rückgang um 30% im Vergleich zum Trendszenario. Öffentliche Ladegleise werden bis auf wenige Ausnahmen verschwinden, ähnliches gilt für kleine und teilweise auch für mittlere Privatgleisanschlüsse. Die Anzahl an Bahn-Logistikzentren und KV-Terminals wird zwar gegenüber 2015 leicht zulegen, allerdings zeigt sich auch hier eine verstärkte Konzentrationstendenz zu großen Anlagen.

  Für das Plusszenario 2030 werden insgesamt rund 17.800 Zugangspunkte zum Schienengüterverkehr in Europa erwartet. Dies sind 10% mehr als im Trendszenario, aber 20% weniger als im Jahr 2015. Daraus wird ersichtlich, dass der Konzentrationsprozess im Schienengüterverkehr auch unter günstigen Randbedingungen nicht aufgehalten, sondern nur abgeschwächt wird. Das prognostizierte Wachstum im konventionellen Bereich führt zu einem stärkeren „Überleben“ von kleinen und mittleren Gleisanschlüssen und zu einer deutlichen Zunahme der Bahn-Logistikzentren. Auf die Anzahl der öffentlichen Ladegleise hat das Mengenwachstum jedoch keinen Einfluss. Für derartige Zugangspunkte wird es auch in einem Plusszenario keine zusätzliche Nachfrage geben, so dass sich ihre Anzahl allenfalls auf dem Niveau des Trendszenarios halten dürfte.

- Der gesamte **Investitionsbedarf für Infrastruktur der letzten Meile** in Europa (für Neu- und Ausbau) wird im Trendszenario auf 9,7 Mrd. EUR für den Zeitraum zwischen 2015 und 2030 veranschlagt. Dies entspricht im Mittel einem erforderlichen Finanzbedarf von 20-25 Mio. EUR pro Land und Jahr. Nahezu die Hälfte (46%) dieses gesamten Investitionsbedarfs wird für KV-Terminals benötigt, weitere 29% bzw. 25% entfallen auf Privatgleisanschlüsse bzw. Bahn-Logistikzentren. Aufgrund mangelnder Marktnachfrage werden keine Neu- und Ausbauten von öffentlichen Ladegleisen und somit auch kein entsprechender Finanzbedarf erwartet; dies gilt für alle Szenarien.

  Im Minusszenario 2030 sinkt der Investitionsbedarf auf rund 9 Mrd. EUR ab. Dieser Rückgang entfällt nahezu ausschließlich auf konventionelle Anlagen, während der Finanzbedarf für KV-Terminals etwa dem des Trendszenarios entspricht.

  Im Plusszenario 2030 erhöht sich der Investitionsbedarf auf 11,2 Mrd. EUR. Im Vergleich zum Trendszenario ist dabei vor allem bei KV-Terminals eine überdurchschnittliche Steigerung (+26%) zu verzeichnen. Für Privatgleisanschlüsse und Bahn-Logistikzentren wird ein Finanzbedarf erwartet, der 7% höher liegt als im Trendszenario.

Leitlinien und Handlungsempfehlungen

Die im Rahmen dieser Studie befragten Marktteilnehmer artikulierten vordringlichen Bedarf bezüglich

- ***Leitlinien*** für **Mitgliedsländer und Regionen**, welche die Formulierung und Weiterentwicklung von Förderprogrammen für Infrastruktur der letzten Meile unterstützen sollen. Diese Leitlinien sollen vor allem darüber Aufschluss geben, welche Institutionen für die **Entwicklung der jeweiligen Förderprogramme** zuständig sein sollten. Weiterhin sollen die Leitlinien auch die Inhalte spezifizieren. Dies betrifft sowohl den Gestaltungsprozess (Wie sollte eine Förderrichtlinie inhaltlich formuliert werden? Wie sollte der Prozess von der Formulierung bis zum Inkrafttreten der Richtlinie geregelt sein?) als auch die zu adressierenden Marktteilnehmer, die Definition förderfähiger Kosten, die Form der Förderungsgewährung etc.
- ***Handlungsempfehlungen***, die hauptsächlich auf die **Entscheidungsstrukturen** bei der Implementierung von **Letzte-Meile-Entwicklungsplänen** auf EU-, Länder- und Regionsebene abzielen. Diese Empfehlungen sollen Vorschläge beinhalten, welche **Verfahrensschritte** für die Ausarbeitung und Einführung eines derartigen Entwicklungsplans in Frage kommen und gleichzeitig ein effizientes Umsetzen ermöglichen.

Insbesondere sollen die Leitlinien gewährleisten, dass **klare, umfassende und effiziente Maßnahmen auf allen staatlichen Ebenen** geplant werden. Diese Maßnahmen und die ihnen zugeordneten Aktivitäten sind in Tabelle 5 dargestellt.

Tabelle 5 – Übersicht über Leitlinien, Maßnahmen und Aktivitäten

Leitlinien	Maßnahmen	Wesentliche Aktivitäten
Planung von Förderprogrammen für Infrastruktur der letzten Meile	Ex-Ante Bewertung	Nachweis, dass die Vorschläge des jeweiligen Förderprogramms schlüssig und zielorientiert sind
	Planungsprozess	Definition von Zielen, Umsetzungsmaßnahmen, Strategien und Alternativen, beabsichtigten Wirkungen sowie von Prioritäten und Verantwortlichkeiten von für Investitionen
	Identifizieren möglicher Förderungsempfänger	Sicherstellen, dass sich alle Beteiligten verpflichten, das Projekt erfolgreich zu entwickeln und zu Ende zu führen
	Definieren der erforderlichen Investitionen	Abdecken aller erforderlichen Investments in Infra- und Suprastruktur (auch IT-Systeme)
	Definieren von Mindestvoraussetzungen, um ein Projekt als förderwürdig einzustufen	Unterscheiden zwischen förderwürdigen und nicht-förderwürdigen Projekten
	Auswahl der Zuwendungsform	Maximieren der Effektivität des Förderprogramms
	Kombinieren verschiedener Fördermechanismen	Erhöhen der Attraktivität für Privatinvestitionen
	Protokollieren der Ergebnisse	Monitoring der Wirksamkeit des Förderprogramms (bzw. von Maßnahmenkombinationen)
	Anwendung geeigneter Vergütungsmechanismen	Gewährleisten eines maximalen Modal-Split-Effektes Straße → Schiene (Entlastung der Infrastruktur, Verringerung von Treibhausgasemissionen)
	Ex-Post-Bewertung	Nachkalkulation von Effizienz und Effektivität des Investitionen

Leitlinien	Maßnahmen	Wesentliche Aktivitäten
Optimierung der Förderprogramme	Investieren in IT-Systeme	Verbesserung der Leistungsfähigkeit auf der Infrastruktur der letzten Meile
	Reduzieren bürokratischer Hemmnisse, Verschlankung des Förderprozesses	Attraktivitätssteigerung von Förderprojekten mit dem Ziel, Privatinvestitionen zu evozieren
	Straffung des Bewilligungsverfahrens	Reduzierung administrativer Risiken und Hürden, um eine zügige Bereitstellung der Finanzmittel und einen pünktlichen Projektstart zu gewährleisten
	Hilfestellung für Antragsteller	Erleichterter Zufluss von Privatkapital, beispielsweise durch PPP-Modelle
Monitoring	Quantitatives Monitoring	• Rechtzeitiges Bereitstellen von vollständigen, exakten und verlässlichen Daten; • Kontinuierliches Verfolgen der Projektentwicklung und frühzeitiges Erkennen von Abweichungen vom Soll-Verlauf
	Qualitatives Monitoring	• Validieren und Komplettieren der Datenbestände aus dem Quantitativen Monitoring • Einholen und Bewerten von Rückmeldungen der Projektpartner
	Statistische Auswertungen	• Analyse aller relevanten statistischen Quellen auf den entsprechenden regionalen Ebenen (NUTS2 und NUTS3); • Bewertung von Wirkungen und Effizienz des jeweiligen Förderprogramms

Handlungsempfehlungen zielen darauf ab, den **Neu- und Ausbau** von Letzte-Meile-Infrastruktur zu **beschleunigen** und entsprechende Maßnahmenpakete bereitzustellen. In diesem Zusammenhang können **drei Ebenen von Förderprogrammen** unterschieden werden (Tabelle 6).

Tabelle 6 – Übersicht über Handlungsempfehlungen

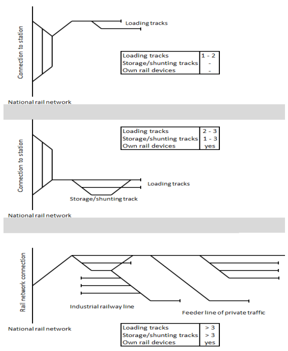
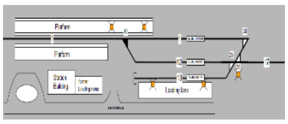
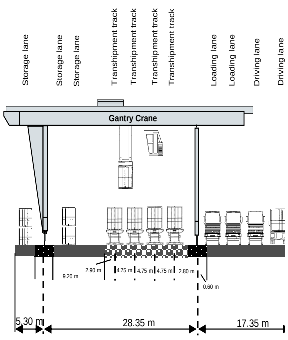
Förderprogramme	Empfehlungen
Regionale Förderprogramme für Infrastruktur der letzten Meile	Umfang und Ausgestaltung regionaler Förderprogramme sollten sich am **Industriebesatz der jeweiligen Region** orientieren. Dies gilt insbesondere für die an die TEN-T-Korridore angrenzenden Regionen.
	Regionale Förderprogramme sollten möglichst mit **steuerlichen Anreizen** kombiniert werden (z.B. für Industrieansiedlungen mit Gleisanschluss).
	Bei Pilotanwendungen regionaler Förderprogramme sollte darauf geachtet werden, dass auch **bestehende steuerliche Regelungen einbezogen** werden mit dem Ziel, Investitionen attraktiv zu machen (z.B. Reduzierung oder Befreiung von kommunalen Steuern).
	EU-Kofinanzierung
Landesweite Förderprogramme für Infrastruktur der letzten Meile	Jedes Land sollte Programme für die **Ko-Förderung von Letzte-Meile-Infrastruktur** mit hoher EU-Relevanz unterstützen.
	Jedes Land sollte **Synergien zwischen unterschiedlichen Arten von Entwicklungsplänen** (z.B. Wirtschafts- und Verkehrsentwicklungspläne) stimulieren, um dadurch zusätzliche Bündelungseffekte für Güterströme zu ermöglichen, die wiederum eine größere Affinität zum Schienengüterverkehr haben.
	Die Länder sollten ihre **Erfahrungen mit steuerlichen Anreizen**, die den Schienengüterverkehr für zusätzliche Nutzer interessant machen könnten, untereinander **austauschen**; dies auch möglichweise mit Unterstützung der

Förderprogramme	Empfehlungen
	Europäischen Kommission.
	EU-Kofinanzierung
EU-weite Förderprogramme für Infrastruktur der letzten Meile	Die EU sollte Entwicklung und Unterhalt von Infrastruktur der letzten Meile mit Mitteln des **CEF und der Strukturfonds kofinanzieren.**
	Die EU sollte Hilfestellung bei der **Koordinierung grenzüberschreitender Projekte** geben. Insbesondere sollen solche Projekte gefördert werden, die einen besonders hohen Nutzen auf europäischer Ebene versprechen.
	CEF-Kofinanzierung

Aus der Analyse der spezifischen Förderprogramme und den Anforderungen der Marktteilnehmer wurden Empfehlungen für zukünftige Ausgestaltung der Förderprogramme für Infrastruktur der letzten Meile abgleitet. In diesem Zusammenhang wurde besonderes Augenmerk auf eine mögliche Einbindung des **Europäischen Fonds für Strategische Investitionen** (EFSI) gelegt, mit dem insbesondere Bahnanbindungen zu Knoten des europäischen Korridor-Kernnetzes gefördert werden sollen.

Die geeignetsten Finanzierungsmodelle für die unterschiedlichen Ausprägungsformen von Letzte-Meile-Infrastruktur sind in Tabelle 7 zusammengefasst.

Tabelle 7 – Finanzierungsmodelle für unterschiedliche Arten von Infrastruktur der letzten Meile

Infrastrukturtyp	Layout	Üblicher Umfang von Förder-projekten	Empfohlene Form der Mittel-zuwendung	Beschreibung des Finanzierungsmodells
Privatgleisanschlüsse		Klein	Nicht-rückzahlbare Zuschüsse	• Die Förderprogramme in Österreich, Deutschland und in der Schweiz sehen ein **Mindest-Projektvolumen zwischen 15.000 und 28.892 EUR** vor. • Bei der **maximalen Förderung** wird in Österreich und Deutschland zwischen Neu- und Ausbaumaßnahmen unterschieden. Bei **Neubaumaßnahmen** liegt die Obergrenze in **Österreich bei 2,5 Mio. EUR**, während sie in **Deutschland bei 8 EUR pro [t] bzw. bei 32 EUR je [1.000 tkm]** liegt, die jährlich auf die Schiene verlagert werden. Bei **Ausbaumaßnahmen** sinken die Beträge auf **2 Mio. EUR (Österreich) und auf 6 bzw. 24 EUR in Deutschland.**
Güterbahnhof		Mittel	Nicht-rückzahlbare Zuschüsse	• Der Infrastrukturbetreiber ist verantwortlich für die Koordinierung der Investitionen aus mehreren Förderinstrumentarien
Schiene-Straße-Terminals/Häfen		Groß	Europäischer Fonds für Strategische Investitonen (EFSI)	• Der Europäische Fonds für Strategische Investitionen (ESFI) sollte den **Neu-/ Ausbau sowie die Instandhaltung von Schiene/Straße-Terminals und Häfen in Knoten des europäischen Kernetzes kofinanzieren.** • EFSI-Bürgschaften umfassen hunderte von Projekten. **EFSI-Finanzierung kann daher vor allem für grenzüberschreitende Projekte sowohl auf EU- als auch auf Länder- und Regionsebene eingesetzt werden.**

Schlussfolgerungen

Auf Basis der durchgeführten Analysen, Modellrechnungen sowie der Befragung von Marktteilnehmern kommen die Autoren dieser Studie zu folgenden Schlussfolgerungen:

- Es gibt einen **Bedarf für Investitionen** in Infrastruktur der letzten Meile **in Höhe von rund 9,7 Mrd. EUR** für den Zeitraum zwischen 2015 und 2030. Der größte Teil dieses Finanzbedarfs (46%) entfällt dabei auf Terminals des kombinierten Verkehrs, gefolgt von Privatgleisanschlüssen (29%) und Bahn-Logistikzentren („Railports", 25%).
- **Infrastruktur der letzten Meile** wird – ebenso wie die entsprechenden Bahn-Produktionssysteme – auch in Zukunft einem weiteren **Konzentrationsprozess** ausgesetzt sein. Im Zuge dieses Prozesses werden große Anlagen und Umschlagpunkte stärker genutzt werden und ihr bahnseitiges Aufkommen steigen. Im Gegensatz dazu werden kleine und auch mittlere Zugangspunkte weniger bzw. gar nicht mehr bedient werden. Insgesamt wird sich die **Anzahl an Zugangspunkten** zum Schienengüterverkehr (Infrastruktur der letzten Meile) weiter **verringern**, auch unter günstigen Rahmenbedingungen.
- Um die erwarteten Aufkommenssteigerungen des kombinierten Verkehrs zu bewältigen, ist vor allem ein **Ausbau der bestehenden Terminals** erforderlich.
- Es ist von großer Wichtigkeit, die **erforderlichen Investitionen durch geeignete Förderprogramme zu flankieren**. Derartige Förderprogramme, wie sie beispielsweise in Österreich, Deutschland und in der Schweiz für Privatgleisanschlüsse umgesetzt werden, haben sich als sinnvolles Instrumentarium zur Förderung von Zugangspunkten zum Schienengüterverkehr erwiesen. Es hat sich gezeigt, dass dadurch erhebliche Verlagerungseffekte Straße → Schiene ausgelöst wurden.
- Derartige Förderprogramme müssen exakt und nach **genau definierten Prioritäten** (z.B. Programme auf Korridor/Länder-/Regionsebene, Neu- oder Ausbau, Infrastruktur und/oder IT-Systeme) definiert werden.
- Im Vergleich zu den „allgemeinen" Infrastrukturprogrammen erscheinen **spezifische Förderprogramme geeigneter**, um einen effizienten Ausbau von Infrastruktur der letzten Meile mit entsprechenden Mengeneffekten zu gewährleisten.
- Diese spezifischen Förderprogramme für Infrastruktur der letzten Meile befinden sich in **Übereinstimmung mit den Zielsetzungen des Weißbuchs** der Europäischen Kommission. Hierin ist unter anderem die **Leistungssteigerung multimodaler Transportketten,** als Voraussetzung für eine stärkere Nutzung ressourcenschonender Verkehrsträger gennant.
- Die Förderprogramme müssen hinsichtlich der **Mobilisierung sowohl von privatem als auch von öffentlichem Kapital** diversifiziert werden. Dies würde die Finanzierung auf eine breitere Basis stellen und die Investitionen noch näher an den tatsächlichen Bedarf heranführen.
- Eine bessere **Koordinierung von Kohäsions- und Strukturfonds mit den Zielen der Verkehrspolitik** würde das Risiko minimieren, dass es zu einer Überlappung mit den Förderprogrammen auf Länderebene kommt.
- Die **Mitgliedsstaaten** müssen dafür Sorge tragen, sowohl **ausreichende Finanzmittel** als auch entsprechende Kapazitäten für Planung und Einführung der Förderprogramme bereitzustellen.
- Es ist von ausschlaggebender Bedeutung, administrative Hürden zu beseitigen, auch, um privates Kapital zu mobilisieren. Vor allem eine **Vereinfachung und Entbürokratisierung der Antragstellung** innerhalb der Förderprogramme wäre erforderlich.
- Es wird empfohlen, die **Zugangspunkte zum Schienengüterverkehr vollständig in die Schienennetz-Nutzungsbedingungen** aufzunehmen, und zwar in einer **einheitlichen Struktur und mit demselben Begriffsverständnis**. Dieses kann sich an der hier entwickelten Einteilung in vier Hauptkategorien (Privatgleisanschlüsse, Öffentliche Ladegleise, Bahn-Logistikzentren (Railports) und Terminals des kombinierten Verkehrs) orientieren. Dadurch könnten zusätzliche Möglichkeiten eröffnet werden, Umschlagpunkte stärker als bisher zu nutzen.

- Ein **leistungsbasiertes Vergütungssystem sollte eingeführt werden**, beispielsweise in Form *differenzierter Zugangsgebühren*, bei welchem das Eisenbahnunternehmen einen Nachlass auf die Zugangsgebühren erhält, sobald ein bestimmtes Maß an Nutzung erbracht ist (gemessen z.B. in [tkm]). Ein anderer Ansatz besteht in der Gewährung von *Subventionen*, die vom Staat an den Betreiber von Infrastruktur der letzten Meile oder an deren Nutzer gezahlt werden. Darüber hinaus können *steuerliche Instrumentarien* benutzt werden, um die verstärkte Nutzung umweltfreundlicher Transportsysteme zu stimulieren.

Außerdem wurden von den Marktteilnehmern weitere Empfehlungen geäußert, die nachfolgend zusammengefasst werden. Sie beziehen sich vor allem auf die Entwicklung eines umfassenden politischen Regelwerks, welches den Umgang mit bestimmten Fördermaßnahmen beschreibt:

- **Bereitstellen von Richtlinien** (ähnlich denen für staatliche Beihilfen für Eisenbahnunternehmen), mit denen der Bekanntheitsgrad von Förderprogrammen für Infrastruktur der letzten Meile gesteigert werden könnte. In diesem Zuge sollte auch über Erfolgsbeispiele berichtet werden, beispielsweise bei besonderen Anlässen wie den TEN-T-Tagen, den Europäischen Tagen des Schienengüterverkehrs etc.
- **Überprüfung der Förderbedingungen** dahingehend, dass sie den Bestimmungen für Staatliche Beihilfen entsprechen und Bereitstellung eines Leitfadens durch die EU, welcher sicherstellt, dass die relevanten Bestimmungen während der Planungsphase eingehalten werden.
- Beachtung der Zweckbestimmung von Fördermitteln des CEF und des Kohäsionsfonds, um eine Ko-Förderung von Projekten auf Länder- und Regionsebene zu ermöglichen.
- **Monitoring der Entwicklung von Infrastruktur der letzten Meile entlang der europäischen Korridore (TEN-T, Schienengüterverkehrskorridore)** und Beachtung von deren Regularien und Entscheidungsgremien.

Résumé

Objectifs, champ et contenu de l'étude

Ces dernières années, un des principaux **challenges de l'Union Européenne et de ses Etats membres a été la réalisation d'infrastructures ferroviaires sur les corridors fret identifiés**.

L'UE a besoin d'un "Réseau Central " permettant la circulation de volumes importants de fret ferroviaires dans des conditions de grande efficacité et de basses émissions de carbone, faisant appel à des combinaisons multimodales des modes de transport les plus efficaces, et au développement de l'utilisation de technologies nouvelles et d'infrastructures adaptées. Plus particulièrement, les efforts pour le réseau central devrait se concentrer la réalisation des **chainons manquants** (aussi en termes de capacité et de performance de l'infrastructure), principalement sections transfrontalières et sections congestionnées / déviations, l'**amélioration des infrastructures existantes** et le **développement de terminaux multimodaux**.

Investir et développer l'infrastructure de desserte terminale qui contribue à la réalisation des objectifs précédents devient donc essentiel dans ce contexte.

C'est particulièrement vrai pour le trafic ferroviaire de wagons isolés qui souffre comme l'a montré l'étude réalisée en 2014 de:

- La diminution générale des volumes de certaines commodités traditionnellement transportées par wagons
- Les coûts élevés et le faible niveau de profit des services du wagon isolé
- **Le manque d'investissement sur les infrastructures de desserte terminale**, y compris les embranchements particuliers, qui doivent être développés et améliorés, sachant que la plupart des embranchements particuliers ont été construits il y a plus de 50 ans.

Dans ce cadre, la Commission Européenne a lancé cette étude pour évaluer **les caractéristiques des programmes d'aide à l'investissement pour les infrastructures de desserte terminale**. L'étude a pour objectifs :

- Identifier et analyser les **programmes spécifiques d'aide à l'investissement et les instruments utilisés pour financer et développer les infrastructures de desserte terminale** dans les pays de l'UE;
- Identifier et analyser les **autres programmes /instruments disponibles** au niveau de l'UE et au niveau national susceptibles d'être utilisés pour financer le développement des infrastructures de desserte terminale bien que non dédiés à cet objectif;
- Fournir **des suggestions, des contributions, des recommandations** pour développer, mettre à jour et suivre la mise en œuvre d'un programme de soutien pour les infrastructures de desserte terminale;
- Identifier les **besoins en investissement** pour la construction, la revitalisation, et la modernisation des infrastructures de desserte terminale dans l'UE.

L'étude s'est basée sur une **large consultation** des acteurs intéressés, impliquant plus de **800 entreprises ou autres agents intéressés** (**en particulier gestionnaires d'infrastructure, opérateurs logistiques, associations industrielles et autorités portuaires**) et sur une **constante interaction avec les Etats membres**.

Définition de l'infrastructure de desserte terminale et types

Le concept d'infrastructure de desserte terminale recouvre une grande diversité de configurations associée à différents modes d'exploitation:

- **Embranchements particuliers**: ils sont propriété privée et ils sont exploités également de façon privée; ils relient des installations de chargement (qui ne font pas partie de l'infrastructure ferroviaire) au réseau ferroviaire public. Dans le cadre de cette étude, les embranchements particuliers concernent principalement des sites industriels de production.
- **Gares avec embranchements publics**: cette catégorie recouvre principalement des voies publiques accessibles pour chargement /déchargement (avec ou sans rampes), principalement situées dans des gares ferroviaires publiques et propriété du gestionnaires d'infrastructure correspondant.
- **Terminaux intermodaux**: les terminaux conçus pour le transbordement d'unités de chargement standardisées (containers, caisses mobiles, remorques routières) entre au moins deux modes de transport. Dans la plupart des cas, ces terminaux sont publics et accessibles à tout opérateur; toutefois, certains d'entre eux sont privés (par exemple dans les ports), et quelquefois sont exploités comme des embranchements particuliers. Dans le cadre de cette étude seuls les terminaux connectés à l'infrastructure ferroviaire (rail/ route ou rail/route/eau) ont été pris en considération.
- **Centres logistiques ferroviaires (Rail ports)**: dans le cadre de cette étude, il s'agit de points de transbordement pour trafic conventionnel et intermodal. Au-delà du seul service de transbordement, ces centres logistiques ferroviaires peuvent aussi offrir des services additionnels comme du stockage, de la consignation, et du pré- /post- acheminement par route.

Résultats de l'analyse

Consultation des intéressés

La large consultation a été réalisée en deux phases:

- La première phase a eu pour objectif de recueillir de l'information sur les **programmes existants**. Elle a été menée au moyen d'une consultation publique (enquête par questionnaire) et une série d'interviews sélectionnées pour rassembler et collecter toutes les données caractérisant les programmes existants.
- La seconde phase a apporté un appui à l'évaluation des **besoins en investissements**. Au cours de cette phase, l'information fournie par chaque intéressé a été utilisée pour appuyer la quantification des investissements nécessaires concernant l'infrastructure de desserte terminale.

Différents besoins ont été soulignés par les différents groupes d'intéressés qui ont participé à la consultation.

Plus spécifiquement, les interviews réalisées avec les représentants des **Etats membres** ont démontré:

- La nécessité de considérer principalement les plateformes intermodales et toutes les installations des infrastructures de desserte terminale (terminaux, gares de triage, infrastructure transfrontalière);
- L'importance de concentrer les efforts sur les investissements innovants (par exemple les systèmes informatiques).

D'autres acteurs intéressés ont souligné les besoins pour:

- Une plus grande implication des **Autorités régionales** pour développer des flux de trafic, source de meilleure **cohésion territoriale** (gestionnaire d'infrastructure italien);
- **Moins de bureaucratie** pour développer de nouvelles infrastructures de desserte terminale (gestionnaire d'infrastructure italien);
- **La mise en œuvre d'un système de gestion de la capacité interopérable afin de surveiller les flux** de traffic (gestionnaire d'infrastructure italien);
- Une **définition plus large des coûts éligibles** afin de prendre en compte les dépenses liées à l'acquisition des terrains (gestionnaired 'infrastructure duPortugal, SA);
- Une **plus grande intégration des différents gestionnaires d'infrastructures de desserte terminale** et une plus grande cohérence de leurs plans de développement (gestionnaire d'infrastructure italien);

- Une **information claire et exhaustive** sur les procédures d'accès aux programmes (entreprises ferroviaires allemandes et Fédération des ports intérieurs).

Finalement il est intéressant de noter que plusieurs entreprises ferroviaires et plusieurs managers de centres logistiques situés dans des ports ont souligné les nécessités suivantes:

- Besoin d'une **plus grande intégration des systèmes ferroviaires et portuaires;**
- Besoin de **mesures de simplification et de promotion de la digitalisation des procédures** pour développer des services intermodaux compétitifs;
- Besoin de **revoir les systèmes d'incitation**;
- Besoin d'étendre les voies **ferroviaires aux terminaux à l'intérieur des ports.**

<u>Programmes /instruments dédiés dans l'UE</u>

Une large gamme de programmes est actuellement disponible pour soutenir les infrastructures de transport à travers l'Europe, depuis les plus génériques avec large spectre jusqu'aux plus spécifiques. Cependant **peu de pays ont introduit des programmes dédiés de soutien au développement des infrastructures de desserte terminale**.

Les programmes dédiés développés au niveau des pays de l'UE – qu'ils soient nationaux, régionaux ou locaux – **ont tous pour objectif de construire, agrandir, réactiver, et moderniser des infrastructures de desserte terminale**. Une définition plus large du concept peut inclure des programmes plus larges dont les **budgets sont seulement en partie dédiés aux infrastructures de desserte terminale** ou qui considèrent d'autres obligations liées à ces investissements (par exemple, le financement est accordé seulement si un pourcentage obligatoire minimum est dédié aux infrastructures de desserte terminale).

Trois pays en Europe proposent actuellement de tels programmes de soutien au développement des infrastructures de desserte terminale:

- **Autriche** *(Programm fur die Unterstutzung des ausbaues von Anschlussbahnen)*
- **Allemagne** *(Richtlinie zur Forderung des neu- und Ausbaus sowie der Reaktivierung von privaten Gleisanschlussen)*
- **Suisse** *(Aides financières pour voies de raccordement).*

Les caractéristiques majeures de ces instruments incluent toujours une **part de financement** de la part du demandeur, des seuils **minimum et maximum pour l'aide accordée et des modes de financement** (voir Tableau 1).

- La part de financement qui peut être accordée pour la construction, l'extension ou la remise en service des embranchements couvre **25 à 50 % de l'investissement en Autriche**, **40 à 60% en Suisse**, tandis qu'en **Allemagne elle peut atteindre 50% des coûts éligibles**.
- L'investissement relatif au projet doit être au **minimum € 15.000 en Autriche et en Allemagne** pour obtenir une aide. Ce seuil est significativement plus élevé en Suisse (€ 28.892)
- L'investissement maximum relatif au projet est définir de **façon différente en Autriche et en Allemagne et est fonction des types d'intervention:**
  - Dans le cas d'**embranchements**, l'autorité autrichienne prévoit un budget maximum par projet **égal à € 2,5 million**, tandis qu'en Allemagne chaque projet relatif à la construction d'embranchements **ne peut recevoir un financement supérieur à € 8 par tonne supplémentaire/an ou € 32 par 1000 tkm supplémentaires/an**.
  - Dans le cas d'**extension/modernisation/remise** en service d'embranchements, l'autorité autrichienne prévoit un seuil pour l'aide financière égal à **€ 2 million par projet**, tandis qu'en Allemagne, l'aide financière ne peut excéder **€ 6 par tonne supplémentaire/an ou € 24 par 1000 tkm supplémentaires/an**.

- La Suisse au contraire fixe un **seuil maximal unique** qu'il s'agisse de construction, extension, rénovation, remise en service d'embranchements. Ce seuil ne peut excéder **€ 29 par tonne manutentionnée sur l'embranchement ou € 4.235 par mètre d'embranchement**.

- Le financement accordé est en général une **subvention non remboursable**; prêts et PPP ne sont pas des formes de financement utilisées pour ce type d'investissement.

Tableau 1: Caractéristiques de programmes d'aide dédiés

Pays	% finançable/ coûts éligibles	Seuil minimum pour le projet	Seuil maximum pour le projet		Forme du financement
			Nouvelle construction	Extension/modernisation	
Autriche	25% à 50%	€ 15,000	€ 2.5 million par projet	€ 2 million par projet	Subvention non remboursable
Allemagne	Jusqu'à 50%	€ 15,000	€ 8 per tonne supplémentaire /an ou € 32 par 1,000 tonne-km/an additionnelles	€ 6 par tonne additionnelle/an ou € 24 par 1,000 tonne-km/an additionnelles	Subvention non remboursable
Suisse	40% à 60%.	€ 28,892	The cofinancement maximum fédéral est limité et ne peut dépasser € 29 (30 Francs suisse) pour chaque tonne transitant sur l'installation terminale annuellement et € 4.235 (4400 Francs suisse) pour chaque mètre de voie mère d'embranchement (ce terme recouvre les voies de raccordement entre le réseau principal et plusieurs embranchements)		Subvention non remboursable

Même s'il est difficile d'analyser les conséquences de tels programmes d'aide sur le trafic ferroviaire, **il est clair que les investissements sur les infrastructures de desserte terminale sont un des facteurs clés du développement du fret ferroviaire**.

En fait l'analyse des marchandises transportées en Autriche, Allemagne et Suisse dans la période 2009-2014, période de validité des programmes (la validité du programme allemand a été étendue jusqu'en 2016) met en évidence un **taux de croissance composé positif d'environ +3,1% comparé avec un taux moyen en Europe EU-28 de 1,8% sur la même période**.

Les principaux résultats de l'analyse des différents programmes d'aide dédiés sont repris ci-dessous :

- **En Autriche, les bénéficiaires du programme d'aide sont en général des entreprises privées**, tandis qu'en **Suisse** des **entités publiques sont aussi bénéficiaires** sous condition que l'investissement soit relatif à une **voie mère** (voie reliant plusieurs embranchements au réseau principal);
- **En Allemagne et en Suisse**, la méthode calcul de l'aide à apporter **est basée sur la performance future de l'installation** (volume de fret généré ou transporté sur les embranchements), tandis qu'en **Autriche les subventions sont simplement calculées en multipliant les coûts éligibles par le % qui peut être cofinancé tel que défini dans le programme**. Un remboursement partiel ou total de la subvention peut être prévu en cas de non-respect des engagements pris par le bénéficiaire;
- **En Autriche, Allemagne et en Suisse, le taux de succès** des demandes de subventions dans le cadre des programmes d'aide, calculé comme le ratio entre le nombre total de demandes et les demandes accordées **est proche de 100%**;
- L'évaluation du **programme d'aide allemand** a montré qu'un transfert durable de la route au rail s'explique par les actions menées au niveau des infrastructures de desserte terminale qui ont conduit à une diminution notable des transports par camion. De plus l'analyse a montré qu'en **l'absence du programme d'aide au financement des infrastructures de desserte terminale, le développement du fret ferroviaire aurait été significativement moindre**.

- Le programme d'aide allemand pour les embranchements concerne exclusivement les infrastructures de desserte terminale construites par les différents opérateurs. De ce fait la subvention maximum ne peut couvrir que 50% du montant total des coûts. Les opérateurs candidats doivent démontrer le transfert route/rail. Entre 2004 et 2010, l**e programme a permis d'éviter 450 millions de voyages de camions ou 10 million tonnes d'émissions de gaz à effet de serre par an**. Un financement public de € 48 million a permis un investissement de € 130 million. Le transfert modal a permis une réduction des émissions de CO2. Les conséquences sur l'emploi et le bénéfice pour l'économie ont été évalués à € 25,5 pour chaque euro versé.
- **Les programmes d'aide dédiés semblent les mieux placés pour favoriser le développement des infrastructures de desserte terminale à la fois en termes de résultat** (par exemple, volume de fret ferroviaire, capacité de l'infrastructure ferroviaire) **et d'efficacité** (un programme d'aide dédié permet une utilisation plus rationnelle des ressources financières, en concentrant leur utilisation seulement sur les projets d'infrastructure de desserte terminale et donc conduisant à un plus grand impact).

<u>Programmes d'aide/instruments non dédiés au niveau EU et au niveau national</u>

Plus de 70 programmes ont été analysés au niveau EU (10) et au niveau national (62). Les programmes d'aide non dédiés ont été classés en trois catégories : faiblement pertinents (FP), Pertinents (P), très pertinents (TP).

Figure 2 – Programmes non-dédiés au niveaux UE et National

Niveaux UE

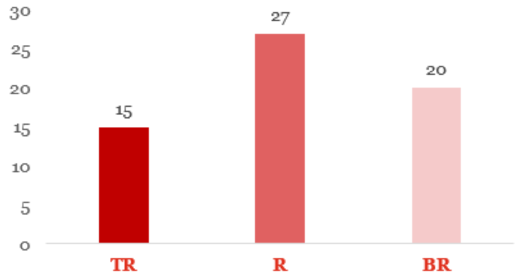
Horizon temporel: 2014 - 2020 (ou au delà)

TR	Mécanisme pour l'interconnexion en Europe (MIE)	€ 26.2 bln
TR	FEDER (Transport)	€ 25.6 bln
TR	Fond de Cohésion (Transport)	€ 10 bln
TR	Programme TEN-T	€ 8.1 bln
TR	Marco Polo II (2007-2013)	€ 450 mln
TR	Shift2Rail	€ 920 mln
R	Fond Marguerite	€ 710 mln
R	BERD Instruments	€ 10 bln*
R	Banque européenne d'investissement LGTT	€ 1 bln
R	Banque européenne d'investissement SFF	€ 3.75 bln

Niveaux national

10 UE Etats Membres ont actuellement (ou ont eu dans le passé) des **systèmes nationaux de financement** en place.

Nombre de programme non-dédié au niveau national



TR: Allemagne (1), Autriche (1), Hollande (3), Hongrie (1), Italie (1), Pologne (3), République Tchèque (1), Roumanie (1), Slovaquie (1), Slovénie (1)

Bas relevance (BR): programmes / instruments centrés sur d'autres domaines que le transport ou les infrastructures de transport (potentiel pour couvrir la dernière mile que de façon marginale et exceptionnellement)

Relevant (R): programmes / instruments couvrant le secteur des transports et en se concentrant sur des questions pas nécessairement liées au dernier-mile (services de transport par exemple, innovation)

Très relevant (TR): programmes concernant spécifiquement le secteur des transports et avec particulier intérêt sur les infrastructures de transport, y compris l'infrastructure ferroviaire

* Incluant les projets des infrastructure de transport pendant la période 1992-2012

Les principaux résultats concernant les programmes d'aide non dédiés sont repris dans le Tableau 2.

Tableau 2: Description de programmes d'aide non dédiés

Programmes d'aide non dédiés	Principales caractéristiques
Programmes d'aide non dédiés au niveau de l'UE	• Six EU programmes sont considérés comme susceptibles d'application pour le financement des infrastructures de desserte terminale : **Shift2Rail, CEF, TEN-T, European Regional Development Fund, Cohesion fund, Marco Polo II**; • La plupart de ces programmes d'aide concernent le financement des investissements pour les infrastructures (TEN-T, CEF, ERDF, Fonds de Cohésion, Fond Marguerite , prêts EBRD and EIB), tandis que les autres programmes concernent le financement des services et des infrastructures (Marco Polo II) et la recherche et l'innovation (Shift2Rail); • La plupart des instruments analysés fournissent une assistance financière non remboursable sous la forme de subventions. • La plupart des instruments (RTE-T, ESIF, Marco Polo II) sont destinés au financement d'une grande diversité de bénéficiaires: gestionnaires d'infrastructure, administrations publiques, organisations internationales et co-entreprises, entreprises privées et partenariats public/privé.
Programmes d'aide non dédiés au niveau national	• Un total de 62 schémas de financement et d'instruments ont été répertoriés dans 23 Etats membres.; • **10 Etats membres ont leurs propres programmes de financement et 13 Etats membres utilisent des programmes de financement non dédiés pour financer des infrastructures de desserte terminale** ; • **La plupart des incitations en faveur des installations ferroviaires terminales sont définies par des subventions. Cependant des prêts et des garanties peuvent aussi être apportées. D'autres incitations tels que abattements et accords fiscaux sont aussi utilisées, mais moins fréquemment.** • Les bénéficiaires potentiels sont identiques à travers les Etats membres. .

Comme souligné précédemment, de nombreux programmes d'aide non dédiés peuvent convenir pour partiellement soutenir les investissements concernant les infrastructures de desserte terminale.

Besoins en investissement/ Potentiel dans l'UE

L'analyse des besoins en investissements a été réalisée en prenant en compte:

- Les différents types d'infrastructures de desserte terminale, principalement: **embranchements particulier, gares avec voies de débord publiques, centres logistiques (rail ports) et terminaux intermodaux (avec accès ferroviaire);**
- La composition de l'infrastructure;
- L'exploitation ferroviaire de ces installations;
- La contribution des infrastructures de desserte terminale à la situation présente du fret ferroviaire et à son futur développement.

Aujourd'hui il existe environ 22.120 infrastructures de desserte terminale telles que décrites ci-dessus. Les 3/4 (15600) sont des embranchements particuliers. Les gares publiques avec voies de débord sont environ 5600, tandis que les terminaux intermodaux sont environ 730 et les centres logistiques sont environ 190.

Le marché ferroviaire évolue ainsi que les infrastructures de desserte terminale. Les résultats de l'analyse des tendances par secteur conduisent à penser que les 4 types d'infrastructures de desserte terminale se développeront de façon différenciée comme décrit dans le tableau suivant.

Tableau 3: Types d'infrastructures de desserte terminale et analyse du marché du fret ferroviaire

Type d'infrastructure de desserte terminale	Développement du marché du fret ferroviaire
Embranchements particuliers	**Le nombre d'embranchements particuliers a diminué de façon significative ces dernières années**. La plupart des embranchements utilisés de façon importante pour des transports en trains entiers ou des transports de groupes de wagons sont toujours en exploitation. A l'opposé, un nombre important d'embranchements moins utilisés n'est plus aujourd'hui utilisé. Dans le futur un processus de consolidation est à attendre : **les grands embranchements particuliers seront utilisés de façon encore plus extensive qu'aujourd'hui**, tandis que les embranchements plus petits seront abandonnés. Au global, le nombre total d'embranchements particuliers devrait diminuer. De nouveaux embranchements ou des embranchements modernisés grâce a des programmes d'aide nationaux et internationaux et la relocalisation de centres industriels de production en Europe du Sud et en Europe de l'est **ne compenseront que partiellement la diminution du nombre total d'embranchements actifs en Europe.**
Gares avec voies de débord publiques	**Les gares avec voies de débord publiques vont perdre leur importance** sauf niches spécifiques ou services proposés par des entreprises ferroviaires régionaux. Les centres logistiques ferroviaires remplaceront certaines d'entre elles.
Terminaux intermodaux	**Un grand nombre de terminaux intermodaux existants vont atteindre leurs limites de capacité.** Les nouvelles constructions deviennent problématiques dans les zones de forte demande de locaux immobiliers. La réponse à l'augmentation des volumes à traiter sera donnée par l'extension et la modernisation des installations existantes. En conséquence, une augmentation limitée du nombre des terminaux intermodaux est à prévoir.
Centres logistiques ferroviaires (Rail ports)	**Les centres logistiques ferroviaires (Rail ports) sont conçus pour traiter des flux de type wagons isolés en offrant des services additionnels aux services de transport.** Leur nombre devrait croître de façon importante, en particulier dans les pays qui projettent de ne plus offrir de services wagons isolés

Pour définir la demande d'investissements, les tendances d'évolution des besoins pour les différents types d'infrastructures de desserte terminale, ce qui conduit aux résultats suivants:

- **Le contexte actuel du marché du fret est aujourd'hui en faveur du transport routier en Europe et défavorise les autres modes de transport**;
- **La part de marché du fret ferroviaire est environ 10%** au niveau européen. **Le transport ferroviaire conventionnel** (trains entiers et wagon hors trains entiers) **domine le marché du fret ferroviaire avec 82% des volumes transportés**. En dépit de sa faible part de marché, le transport intermodal améliore fortement sa pertinence, en particulier en Europe de l'ouest, en Europe centrale et en Europe du sud;
- **L'organisation de la production ferroviaire dépend considérablement des infrastructures de desserte terminale**. Caractéristiques des infrastructures de desserte terminale et systèmes de production doivent conduire à l'équilibre des entreprises ferroviaires et des entreprises industrielles. Si les conditions d'équilibre ne sont pas atteintes, l'exploitation des infrastructures de desserte terminale – et aussi le management et le développement de l'infrastructure elle-même – devient compliqué et sa performance se détériore ;
- **Le transport ferroviaire conventionnel concerne plutôt les marchés liés à l'énergie (charbon, produits pétroliers), à l'acier (produits sidérurgiques), à l'automobile, aux produits chimiques et aux industries bois/papier**. Ces marchés représentent 64% du volume total transporté par fer dans l'UE 28+2. La position ferroviaire pour ces marchés est forte comparée à la concurrence routière et à la concurrence voie d'eau, mais ces marchés sont plutôt stables voire décroissants dans le futur. D'un point de vue logistique, **les industries sidérurgiques, chimiques et automobile représentent la majorité de la demande en matière d'infrastructures de desserte terminale et de leur exploitation**.

Pour prévoir la future demande pour les volumes à transporter sur des infrastructures de desserte terminale ainsi que les besoins en infrastructures et en investissements à l'horizon 2030, un modèle spécifique a été construit reprenant les conditions cadre. Trois scénarios différents ont été bâtis et sont décrits dans le Tableau 4.

Tableau 4 : Matrice des scenarios développés

Scenarios	Principales hypotheses	Variation du volume transporté par rail (%) compare au status quo (2010)	Variation du nombre d'installations ferroviaires terminales (%) comparé au status quo (2015)	Besoins en investissement pour les installations ferroviaires terminales infrastructure
Scenario tendanciel "2030"	Extrapolation des tendances actuelles (ie, augmentation du nombre de grands embranchements, abandon de nombreux petits et moyens embranchements, quasi disparition des embranchements publics en gares, substitution partielle des embranchements fermés par les centres logistiques ferroviaires)	+19%	-27%	€ 9.7 billion
Sscenario "minus" "2030"	Conditions défavorables au développement du fret ferroviaire comparées aux conditions du scenario tendanciel (ie plus grande concentration des très grands embranchements, abandon encore plus important de petits et moyens embranchements, disparition des embranchement publics en gare)	-2%	-49%	€ 8.9 billion
Scenario "Plus" "2030"	Conditions plus favorables au développemt du fret ferroviaire compares aux conditions du scenario tendanciel (ie continuation de la tendance au développement de très grands embranchements particuliers, survie d'embranchements particuliers petits et moyens).	+28%	-20%	€ 11.2 billion

Ces trois scénarios ont été définis à partir des paramètres suivants :

- Différents niveaux de réponse aux politiques transport EU, nationales et régionales ;
- Différents types de programmes pour le financement des infrastructures de desserte terminale ;
- Différentes hypothèses pour le développement du transport ferroviaire hors trains entiers en Europe, différents niveaux d'intégration de systèmes de production ferroviaire innovants ainsi que des améliorations techniques qui leur sont liées et concernent les infrastructures de desserte terminale ;
- Différentes conditions de concurrence entre le transport routier et le transport ferroviaire.

Compte tenu des différents scénarios, les besoins en investissements nécessaires pour l'horizon 2030 représentent **€ 9,7 billion** (Scenario tendanciel).

Guides pour l'action et recommandations

Les acteurs concernés et ayant participé à cette étude ont insisté sur le besoin de deux contributions principales qui ont été développées en fonction des demandes exprimées :

- ***Guides pour l'action***, développés pour les **Etats membres et les régions**, pour préparer et mettre en œuvre des programmes d'aide techniquement solides et efficaces. Ces guides devront fournir des indications sur les entités qui seront en charge des programmes spécifiques d'aide. Ces guides devront également fournir des suggestions sur les contenus potentiels des programmes (« comment » concevoir et définir le programme d'aide, depuis la phase de planification jusqu'aux améliorations apportées lors de la mise en œuvre opérationnelle), sur les acteurs intéressés à impliquer, sur les coûts éligibles, sur les formes d'aide, sur les mécanismes de motivation, etc;
- ***Recommandations*** concernant principalement les **systèmes de gouvernance** pour la mise en œuvre d'un plan de développement des infrastructures de desserte terminale au niveau de l'UE, d'un Etat membre, d'une région. Les recommandations devront aussi introduire des suggestions sur la mise en œuvre et les outils à prendre en considération au cours du développement du plan et lors de la définition du programme spécifique d'aide au niveau concret et opérationnel.

Les guides pour l'action doivent indiquer particulièrement que des **mesures claires, concrètes et exhaustives sont prévues sur l'ensemble des territoires concernés**. Ces mesures incluent en particulier les principales activités suivantes.

Table 5: Guide d'actions

Guide d'actions	Mesures	Principales activités
Planification d'un programme d'aide aux installations ferroviaires terminals	Evaluation ex-ante	Toujours s'assurer que ce qui est proposé dans le programme d'aide aux investissements pour les installations ferroviaires terminales est logique et justifié
	Processus de planification	Identifier et définir les buts et les objectifs, les indicateurs de performance, les stratégies et leurs alternatives, les impacts et les priorités d'investissement ainsi que les responsabilités.
	Identification des bénéficiaires d programme d'aide	S'assurer de l'engagement de tous les acteurs intéressés à participer de façon pro-active et co-operative au développement réussi du projet
	Définition des différents types d'investissement couverts par le programme d'aide	Couvrir tous les investissements physiques ainsi que les investissements en infrastructures intangibles (ie systèmes IT).
	Définition des conditions à remplir pour qu'un projet soit éligible pour le programme d'aide	Bien différencier les projets éligibles à l'aide des projets non éligibles.
	Choix des formes d'aide pouvant être envisagées	Maximiser l'efficacité du schema d'aide
	Mécanisme de combinaison de différents programmes d'aide	Attirer des aides du secteur privé
	Indicateurs de mesure des résultats	Suivre la performance du programme d'aide spécifique (ou d'un ensemble d'actions)
	Mise en place d'un mécanisme d'incitations	S'assurer d'un transfert maximal de la route au rail à la fois en termes de réduction d'encombrements

Guide d'actions	Mesures	Principales activités
		et de réduction des gaz à effet de serre.
	Evaluation ex-post	Mieux comprendre les conditions d'obtention de résultats concrets et d'efficacité.

Guide d'actions	Mesures	Principales activités
Improvement of Last-mile support programme **Planification d'un programme d'aide aux installations ferroviaires terminals**	Investissement dans un système innovant	Améliorer la performance des infrastructures de desserte terminale.
	Améliorer l'efficacité des procédures	Renforcer l'attractivité d'un projet pour le secteur privé pour l'encourager à investir dans le projet.
	Alléger les procédures administratives de permis	Réduire les risques liés à la lourdeur des procédures administratives, ce qui en même temps facilitera la réalsiation dans les délais du projet
	Evaluation ex-ante	Toujours s'assurer que ce qui est proposé dans le programme d'aide aux investissements pour les installations ferroviaires terminales est logique et justifié
Monitoring	Suivi quantitatif	• S'assurer du recueil les données les plus complètes, précises, fiables et s'assurer que ces données seront fournies à temps ; • Apporter l'aide nécessaire à l'entité chargée de comprendre le développement le % de la réalisation de l'investissement et apporter éventuellement les mesures correctrices nécessaires.
	Suivi qualitatif	• Compléter et enrichir les données quantitatives • Apporter l'aide nécessaire à l'entité en charge du programme d'aide pour obtenir des informations de la part des principaux acteurs impliqués
	Suivi statistique	• Analyser toutes les sources d'information pertinentes au niveau des entités territoriales (NUTS2 et NUTS3) • Evaluer les effets et l'efficacité du programme d'aide

Les recommandations doivent inciter à la définition de **procédures accélérées** pour aider la construction et le renouvellement des installations ferroviaires terminales. **Trois types d'instruments** peuvent être développés :

Tableau 6: Schéma des recommandations

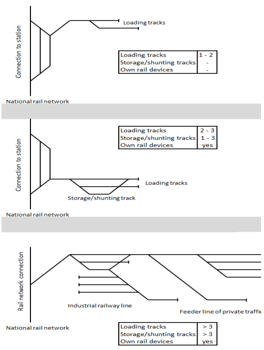
Instruments d'aide	Principlaes recommandations
Programme d'aide régional aux investissements pour les infrastructures de desserte terminale	Chaque schema d'aide régional doit être défini en tenant compte de la **densité sur la region des sites industriels**, en particulier pour les zones situées le long des corridors TEN-T qui traversent le pays.
	Chaque schema d'aide régional devrait pouvoir associer des **incitations fiscales** (par exemple pour de nouvelles zones industrielles qui auront des connexions ferroviaires).
	Chaque schema d'aide régional pilote devrait pouvoir utiliser des incitations fiscales pour **attire des investissements** (par exemlel en réduisant ou en éliminant des taxes locales sur des périodes à définir).
	EU cofinancement
Programme d'aide national aux investissements pour les infrastructures de desserte terminale	Chaque pays devrait encourager les **programmes de cofinancement pour le développement et l'entretien des embranchements** particuliers importants pour l'EU.
	Chaque pays devrait encourager les **synergies entre les différents plans de développement** (ie croissance industrielle et économique et plans de

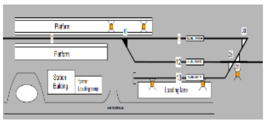
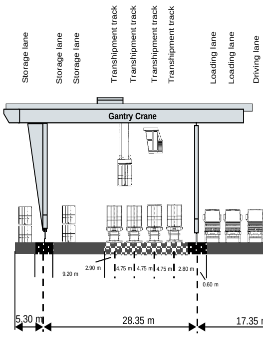
Instruments d'aide	Principlaes recommandations
	développement du système de transport ferroviaire) de façon à soutenir tous les sujets qui pourront contribuer au développement des transport de fret par rail plus écologiques.
	Les pays soutenus par l'UE devraient mettre en commun les meilleures pratiques concernant les **incitations fiscales pour attirer les utilisateurs des installations ferroviaires terminales**.
	EU cofinancement
Programme d'aide européen (EU) pour les investissements pour les infrastructures de desserte terminale	L 'UE devrait cofinancer le développement et l'entretien des infrastructures de desserte terminale via **les Fonds de Cohésion et structurels**.
	L'UE devrait aider en Guidant la **coordination transfrontalière** et contribuer via des financements européens au financement de projets à haute valeur ajoutée pour l'UE.
	CEF cofinancement

L'analyse d'une part des programmes d'aide dédiés et d'autre part des besoins des acteurs concernés par les investissements pour les installations ferroviaires terminales a montré les recommandations es plus pertinentes à mettre en œuvre en fonction des différents types d'infrastructures de desserte terminale. Par ailleurs une attention toute particulière a été apportée à l'utilisation potentielle du **Fonds Européen pour les Investissements stratégiques** (EFSI) pour les investissements permettant de relier ferroviairement aux nœuds du Réseau de base.

Les solutions de financement des installations ferroviaires terminales les plus appropriées en fonction du type d'installations sont reprise dans le tableau suivant:

Tableau 7 : Formes de financement pour les infrastructures de desserte terminale

Types d'infrastructure de desserte terminale	Disposition de l'infrastructure de desserte terminale	Taille du projet	Forme du financement	Description du financement
Embranchement particulier		Petit	Subvention non remboursable	• Selon les trois programme d'aide dédiés identifiés (autriche, Allemagne et Suisse) le seuil minimum d'un projet est très faible (de 15000 à 28892 euros) • En Autriche et en Allemagne, le seuil maximum d'un projet depend du type d'intervention. En Autriche la construction d'un nouvel embranchement peut être prise en considération jusqu'à 2,5 million euro, tandis qu'en Allemagne le seuil de fianncement maximal est de 8 euro par tonne supplémentaire /an, ou 32 euro par 1000 tonne km supplémentaires /an. Au contraire, les extensions et modernisations de'embranchements sont financées jusqu'à 2 million euro en Autriche et jusqu'à 6 euro par tonne supplémentaire /an ou 24 euro par 1000 toonekm /an en Allemagne).

Types d'infrastructure de desserte terminale	Disposition de l'infrastructure de desserte terminale	Taille du projet	Forme du financement	Description du financement
Gare Fret		Moyenne	Subvention non remboursable	• Le gestionnaire d'infrastructure est responsible de la coordination des investissements concernant plusierurs projets en matière d'infrastructures de desserte terminale.
Rail-Road terminals/Ports		Grand	Fond européen pour les investissements stratégiques	• Le Fonds Européen pour les investissements stratégiques devriat cofiannecr le développemetn et l'entretien des infrastructures ferroviaires termainles sur le réseau de base (terminaux rail route /rail ports) • La garantie apportée par le Fonds Européen pour les investissements stratégiques est basée sur un pportefeuille de projets. Elle couvre des centaines de projets. **Cet instrument pourrait donc être utilisé , en particulier dans le cas de projets d'infrastructures de desserte terminale transfrontalières à la fois au niveau EU mais aussi au niveau nationale et régional.**

Conclusions

Sur la base des analyses réalisées à partir des données recueillies et des contributions des acteurs intéressés, les auteurs de l'étude «**Conception des programmes d'aide pour les infrastructures de desserte terminale**» concluent de la façon suivante:

- Il y a un **besoin d'investissement** pour les installations ferroviaires terminales a court et moyen terme;
- **Les programmes d'aide dédiés pour soutenir ces investissements paraissent convenir mieux que les programmes non dédiés**, à la fois en termes de résultat (sur le plan des volumes de fret ferroviaire et des capacités des infrastructures) et d'efficacité (les programmes d'aide dédiés permettent une utilisation plus rationnelle des ressources financières en les concentrant seulement sur les projets d'infrastructures de desserte terminale et en assurant de ce fait un meilleur impact);
- Il est primordial d'**attirer les investissements avec des programmes d'aide dédiés**. Les demandes d'aide via des programmes dédiés en Autriche, Allemagne et Suisse ont un taux de succès de pratiquement 100%. Dans ces pays, **les investissements concernant les infrastructures de desserte terminale** (nouvelle construction, extension/modernisation et réouverture d'installations terminales) **sont considérés comme des opportunités superbes de promotion du développement de l'activité du fret ferroviaire** et à ce titre contribuent au transfert modal de la route au rail;
- Le champ d'intervention des programmes d'aide doit être défini avec soin en tenant compte des priorités identifiées et évaluées (corridor, Etats, nouvelle installation ferroviaire terminale et/ou modernisation, infrastructure et/ou terminal intermodal);
- **La capacité des installations ferroviaires terminales devra être augmentée pour améliorer la performance du transport intermodal**;
- L'adoption d'**instruments d'aide dédiés pour les investissements pour les installations ferroviaires terminales** s'inscrit dans les mesures permettant la réalisation des objectifs du Livre Blanc préparé par l'UE. Plus particulièrement, un des objectifs essentiels du Livre Blanc est l'**optimisation de la performance de chaînes logistiques multimodales** par une plus grande utilisation des modes de transport les plus efficaces sur le plan des ressources énergétiques ;
- **Il est nécessaire de diversifier les instruments d'aide au financement en utilisant à la fois des fonds publics et privés**, de façon à développer et consolider le marché du fret/ demande via le domaine de l'investissement ;
- **Une meilleure coordination entre l'utilisation des financements des Fonds de Cohésion et structurels** et les objectifs de la politique transport devrait réduire les risques de chevauchement des différents programmes au niveau des pays;
- **Les Etats membres devront s'assurer de budgets suffisants**, de capacités de planification de projet efficace et de mise en œuvre dans leur procédure de planification budgétaire;
- **La diminution de la lourdeur administrative** (normes moins nombreuses et plus flexibles, standards et règlements d'exploitation pour l'accès aux installations ferroviaires terminales et leur exploitation plus adaptées) est nécessaire pour libérer le potentiel de financement privé destiné aux installations ferroviaires terminales;
- **Il est important que les Documents de Référence du Réseau de chaque gestionnaire d'infrastructure informent sur les installations ferroviaires terminales**. Dans la pratique, cette information serait également un signal important donné sur le marché du fret ferroviaire visant à développer une prise de conscience des facilités offertes pouvant être accessibles à tout opérateur de façon à optimiser leur utilisation et à partager leurs coûts;
- **Un mécanisme d'incitation devrait être proposé basé sur l'efficacité des différentes installations**. La possibilité d'une différenciation des péages d'infrastructure est un instrument basé sur l'efficacité qui implique à la fois le gestionnaire d'infrastructure et l'entreprise ferroviaire par lequel l'entreprise ferroviaire a une ristourne sur le péage d'accès si elle remplit des conditions de

performance (par exemple, train*km). Un autre instrument concerne des subventions accordées par un Etat membre qui fournit une aide financière au propriétaire d'un embranchement qui construit un lien ferroviaire, ou à l'entreprise ferroviaire qui transporte du fret sur lien ferroviaire spécifique. Enfin des incitations fiscales peuvent être envisagées comme des abattements fiscaux aux opérateurs mettant en œuvre des solutions permettant une meilleure protection de l'environnement.

Des recommandations supplémentaires élaborées à partir des discussions avec les acteurs intéressés sont à envisager ; elles prennent en considération la complexité du marché du fret ferroviaire et les besoins en investissements pour les installations ferroviaires terminales.

Ces recommandations font référence en particulier au développement d'une approche globale politique et réglementaire pour mieux définir les mesures de soutien aux investissements :

- **Fournir des Guides de travail** (du type de ceux fournis pour les aides d'Etat aux opérateurs ferroviaires) faciliterait la promotion de programmes d'aide dédiés aux investissements pour les installations ferroviaires terminales. De même, la dissémination d'information sur les meilleures pratiques et les succès au cours d'évènements sectoriels (TEN-T days, EU Rai Freight days, etc.) serait probablement très positivement accueillie ;
- **Fournir les moyens de vérifier que les programmes d'aide dédiés remplissent les conditions applicables aux Aides d'Etat** et fournir la marche à suivre pour obtenir l'exemption au niveau du programme d'aide dédié (et pas au niveau de chaque projet) ;
- **Envisager l'allocation spécifique de fonds structurels et de cohésion** pour cofinancer des programmes d'aide dédiés aux investissements pour les infrastructures terminales ferroviaires qui pourraient être sélectionnés après appel d'offre de façon à sélectionner les programmes les plus prometteurs et les bénéfices les plus importants ;
- **Soutenir et gérer les développements des infrastructures de desserte terminale sur le réseau de base/corridors de fret** en relation avec le cadre réglementaire existant (ie Corridors du Réseau de base, structures de management des corridors de fret et comités).

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List of abbreviations

BMVIT = Bundesministerium für Verkehr, Innovation und Technologie

CEF = Connecting Europe Facility

CLECAT = European association for forwarding, transport, logistics and customs services

EBRD = European Bank for Reconstruction and Development

EC = European Commission

EFSI = European Fund for Strategic Investments

EIA = European Intermodal Association

EIB = European Investment Bank

EIM =European Rail Infrastructure Managers

ERDF = European Regional Development Fund

ERFA = European Rail Freight Association

ESC = European Shippers' Council

ESFI = European structural and investment funds

ESPO = European Sea Ports Organization

EU = European Commission

LGTT = Loan Guarantee for Transport Projects

LMDB = Last-mile data base

LMI = Last-mile infrastructure

LMMP = Last-mile monitoring plan

LMDP = Last-mile development plan

MS = Member State

PBI = Europe 2020 Project Bonds Initiative

PPP = Public Private Partnership

RFC = Rail Freight Corridor

SCHIG mbh = Schieneninfrastruktur-Dienstleistungsgesellschaft mbh

SWL = Single WagonLoad

TEN-T = Trans European Network Transport

TFEU = Treaty on the functioning of the European Union

UIRR = International Union for Road – Rail Combined Transport

1. Introduction

1.1. The challenge and the options: investments in last-mile infrastructure

One of the main **challenges of the European Union and its Member States** during the last years **has been the realisation of rail infrastructures on the identified rail freight corridors.**

The EU needs a "core network" of corridors, carrying large and consolidated volumes of freight traffic with high efficiency and low emissions, with extensive use of more efficient modes in multimodal combinations and the widespread application of advanced technologies and infrastructures. In particular, the core network should focus on the **completion of missing links** (in terms of effectiveness) – mainly cross-border sections and bottlenecks/bypasses – on the **upgrading of existing infrastructure** and on the **development of multimodal terminals.**

For this reason, **it is essential to invest and develop the rail last-mile infrastructure**.

Moreover, as highlighted in the 2014 single wagonload study[12], wagonload traffic suffers from various difficulties:

- a general reduction of the volumes of some commodities often transported by wagonload;
- high costs and low profitability of wagonload services;
- in addition, a **lack of investments in last-mile infrastructure**, **including private sidings**. Moreover, most of the sidings, built more than 50 years ago, need to be heavily upgraded.

In this view, the European Commission has lunched this study to appraise the **design features for supporting programmes for investment in last-mile infrastructure**.

The study was developed on the following **four tasks**:

- Task 1 – to identify, describe and analyse the existing **dedicated support-programmes/instruments** in the EU countries for the financing and development of last mile infrastructure;
- Task 2 – to identify, describe and **analyse other relevant programmes/instruments** at EU and national level for financing and development of last mile infrastructure;
- Task 3 – to draft a **practice guide** and rules for national and EU-wide financial and non-financial programmes for last mile infrastructure;
- Task 4 – to **identify investment needs** in the EU for the construction, revitalisation and modernisation of last mile infrastructure.

In order to obtain realistic results, **a strong stakeholder consultation**, which included an online survey and one-to-one interviews, **has involved the most relevant players** from the **rail and logistic markets**.

1.2. Purpose and contents of the report

The purpose of the Final Report is to provide the outcomes of the analysis, shifting in annex the specific adopted methodologies and further details of the study.

Part of the document – focused on guidelines and final recommendations – could be addressed to **Member States** and **Regions** willing to set-up effective last-mile support programmes at country/regional level.

[12] Study on Single Wagonload traffic in Europe – challenges, prospects and policy options, PwC, 2014

The contents, outcomes and recommendations described in this report have been drawn on the basis of the following two main steps, specifically:

- **Analysis of the existing dedicated programmes/instruments** and **other programmes/instruments** at EU and country level;
- **Comprehensive stakeholder consultation in order to collect specific needs and requirements** (in terms of investments) aimed at developing last-mile infrastructure.

The report is **structured** as follows:

- *Section 2* presents the **stakeholder engagement approach** and the outcomes from the on line consultations and the interviews in order to explore and fine-tune the list of schemes and information about the way they operate;
- *Section 3* shows the **support programmes/instruments at EU and Country level** (dedicated and not dedicated);
- *Section 4* is focused on the **investment needs/potential in EU** emerged by the stakeholder consultation;
- *Section 5* provides **suggestions, contribution** and **recommendations** in order to develop, update and monitoring a last mile support programme;
- *Annexes A - C* present the data analysis on the identified key countries (*Annex A1*), the methodology of the stakeholder consultation (*Annex A2*), the designed questionnaires for the first and second consultation (*Annex B* and *Annex C*).
- *Annexes D - E* present the dedicated and non-dedicated programmes.
- *Annex F* shows a comparative matrix about programmes/instruments at EU level;
- *Annex G* presents the outcomes of the Multiannual calls CEF 2014;
- *Annexes H – K* show a transport market overview in the European countries (*Annex H*), a typical rail freight production system and selected case studies (*Annex I*), such technical developments for innovative last mile services (*Annex J*) and several examples for industry cluster-specific last mile infrastructure and operation (*Annex K*);
- *Annex L* shows a specific focus on the European Fund for Strategic Investments (EFSI).

The following table gives an overview of the tasks stated in the proposal and the related chapter in this report.

Table 7 - Assignment of tasks in the proposal to respective chapters in the report

Tasks	Main activity	Task according proposal	Chapter within this report
Task 1	**Activity 1.a** Identification of the support programmes/instruments	Collection of existing programmes and instruments for financing and development of last-mile infrastructure	3.1
	Activity 1.b Analysis of the main features of the dedicated support programmes/instruments	Analysis of the features of such programmes and instruments	3.1.1
	Activity 1.c Comparative analysis of dedicated support programmes /instruments	The experiences of existing support-programmes and instruments need to be compared in terms of common features, key factors and best practice	3.1.2
	Activity 1.d Evaluation of the existing dedicated support programmes/instruments with regard to concept and impact	Assessment of the most relevant programmes/instruments.	3.1.3
Task 2	**Activity 2.a** Identifying EU/National level programmes	Identification of the relevant EU and Member State programmes that can be used to invest in last-mile infrastructures	3.2.1, 3.2.2, 3.2.3, 3.2.4
	Activity 2.b Analysis of the main features of ancillary programmes/instruments	In-depth analysis of currently existing ancillary financing programmes across the EU (both EU and MS levels).	3.2.5
	Activity 2.c Comparative analysis of the identified ancillary programmes	Two-layered (EU/MS levels) comparative analysis of currently existing ancillary financing programmes	3.2.5
	Activity 2.d Evaluation of the ancillary programmes/instruments with regard to concept and impact	In-depth evaluation of the ancillary funding programmes on the basis of their concept and impact.	3.2.5
Task 3	**Activity 3.a** Recognition of the needs and requirements	Overview of features and areas of interest to be fully covered by the best-practice guide.	4.4, 4.5
	Activity 3.b Recognition of the existing guidelines applied in other	Collection of existing guidelines for the development of last-mile infrastructure	3.1, 3.2

Tasks	Main activity	Task according proposal	Chapter within this report
	Countries		
	Activity 3.c Drafting of the Best practice guide and proposed rules	Practice guide for national and EU-wide financing and development programmes for last-mile infrastructure (including also recommendation on support measures or incentives and obligations/conditions)	5.1, 5.2
Task 4	**Activity 4.a** Market development	Analyse of national and European studies	4.3.1, 4.3.2, 4.3.3, 4.4, 4.5
		Analyse of national and European forecasts and development of European Corridor	4.3.1, 4.4.1
		Current rail freight market	4.3.2
		Stakeholder consultation	4.3.4
		Analysis of relevant market trends and technical issues	4.3.3.1, 4.3.3.3
		Development of rail productions systems	4.3.3.2
		Most likely development of rail freight in Europe (Forecast 2030)	4.4.1
	Activity 4.b Deduction of infrastructure needs	Clustering into industrial sectors	4.3.3.4.1
		Analyse needs of industrial sectors	4.3.3.4.2
		Analyse operation last-mile operation concepts	4.3.3.2, 4.3.3.4.2
		Infrastructure costs	4.5
	Activity 4.c Deduction of Investment Needs	Survey on last-mile infrastructure in Europe	4.2.1, 4.3.4.4
		Estimation of country-wise developments	4.3.2, 4.4, 4.5
		Information on last-mile infrastructure per industrial cluster	4.2, 4.3.3.4
		Future market developments and logistical requirements	4.3.3
		Data base on last mile infrastructure in Europe by 2030 by type of last-mile infrastructure	4.4.3
		Investment needs	4.5

1.3. Last-mile infrastructure definition

According to the definition provided by the European Commission, "**last-mile infrastructure**" is a "***section of rail infrastructure between the entry point to the main network and the final destination/starting point of a train"*** (e.g. terminal in a port, maintenance workshop, siding of an industrial plant). This includes the tracks within specific facilities, such as terminals. A junction point provides the link to the main railway network[13] .

In contrast to the general usage of the term "last mile" in the logistic world, this study does not capture the entire transport chain (where the last mile often is performed on road), but concentrates on the last (or first) rail part. Thus, the focus is on all possible access points to/from rail freight with **the loading facility** as the nucleus of last-mile infrastructure, providing all necessary infrastructural, technical and operational components to tranship cargo from/to rail (loading ramps, paved surfaces, handling equipment, etc.).

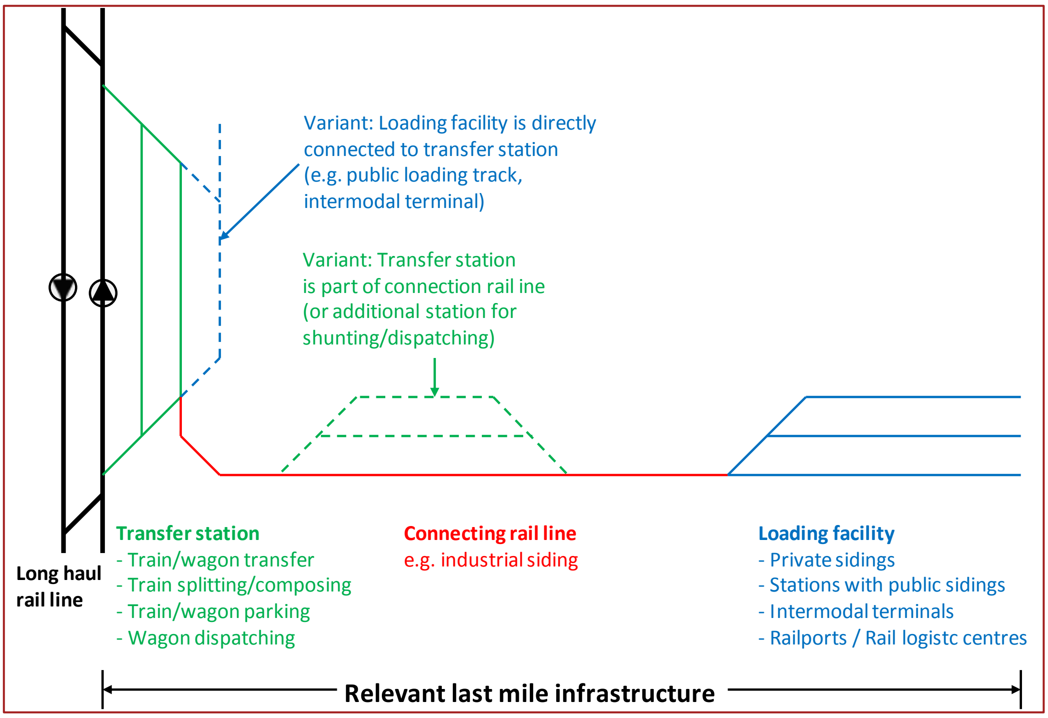
The loading facilities might be located at industrial sites, warehouses, railports, ports or intermodal terminals, etc.

In order to ensure functionality of the loading facility, supplementing infrastructure is needed in most cases and hence incorporated into the term "last-mile infrastructure", specifically:

- Smaller local shunting yards, indicated as transfer stations, for train formation in the vicinity of above-mentioned sites, if their primary purpose is to enable the collection and delivery of wagons/trains to such specific sites;
- Local rail tracks or connecting lines leading from and to the loading facilities (rail tracks that are not used by other traffic than that from and to these sites).

Figure 2 provides a schematic overview on these parts of last-mile infrastructure for rail freight.

Figure 3 - Components of "Last mile infrastructure" for rail freight



Source: HaCon

[13] Sidings & last miles – EU point of view. House of Rail conference on "Sidings & last miles" Brussels, 28 November 2008. Accessible at: http://www.erfarail.eu/uploads/pageImages/working_issues/house%20of%20rail/EU_DG_TREN_MCastelletti_28_11_08.pdf

Of course, the constellation of these last-mile infrastructure components shows numerous variants in real life. For example, in many intermodal terminals the transfer station (i.e. tracks for train arrival/departure) is directly connected to the loading facility (i.e. the transhipment tracks) without a connecting line. Other sites might have an additional transfer station for fine-tuning of wagon composition or parking.

The following table describes each part of a last-mile infrastructure to help better understand the type of infrastructure object of our analysis.

Table 8 – Last-mile infrastructure components

Name	Description
Track infrastructure at industries and storages in terminal	Tracks used for transhipment of goods or intermodal loading units between rail and other transport modes.
Local sidings	Tracks connecting track infrastructure at industries and storages in terminal to and from the main rail line. Such tracks are not used by other traffic from and to such sites. In this category are included all the related signalling equipment, equipment for electric overhead wire, equipment for protection of level crossing (if applicable).
Switches connecting sidings	Switches connecting sidings to the main line network. All related signalling equipment and the equipment for electric overhead wire, equipment for protection of level crossing are included.
Loading and unloading infrastructure	All infrastructure for loading and unloading freight wagons at track infrastructure at industries and storages in terminal; they are loading ramps, paved surfaces, power supply equipment, surveillance, fences and gates.
Minor and local yards for train formation	Yards used for train composition close to the sites hosting tracks used for transhipment of goods or intermodal loading units between rail and other transport modes.

Given the purpose to stimulate investments in last-mile infrastructure, several factors have to be considered:

- The rail freight transport demand should be encouraged by providing incentives to affect the modal shift from road to rail;
- The rail freight transport demand needs:
  - A "critical mass" to be profitable and sustainable. Last-mile infrastructure can help achieve a critical mass by increasing the load factor;
  - A governance system characterized by principles and specific procedures;
- There are "social" benefits and economic costs: a relevant portion of benefits of the rail freight transport cannot be fully monetised. These benefits can be partially economically relevant for railway operators, which bear the investment costs.

Finally, under the definition of the last mile, the present study addressed also specific situations such as the **"voies capillaires"** in France, which are relatively large local rail networks connecting several points of origin/destination of railway freight and having no other role than providing local linkage.

1.3.1. Types of last-mile infrastructure

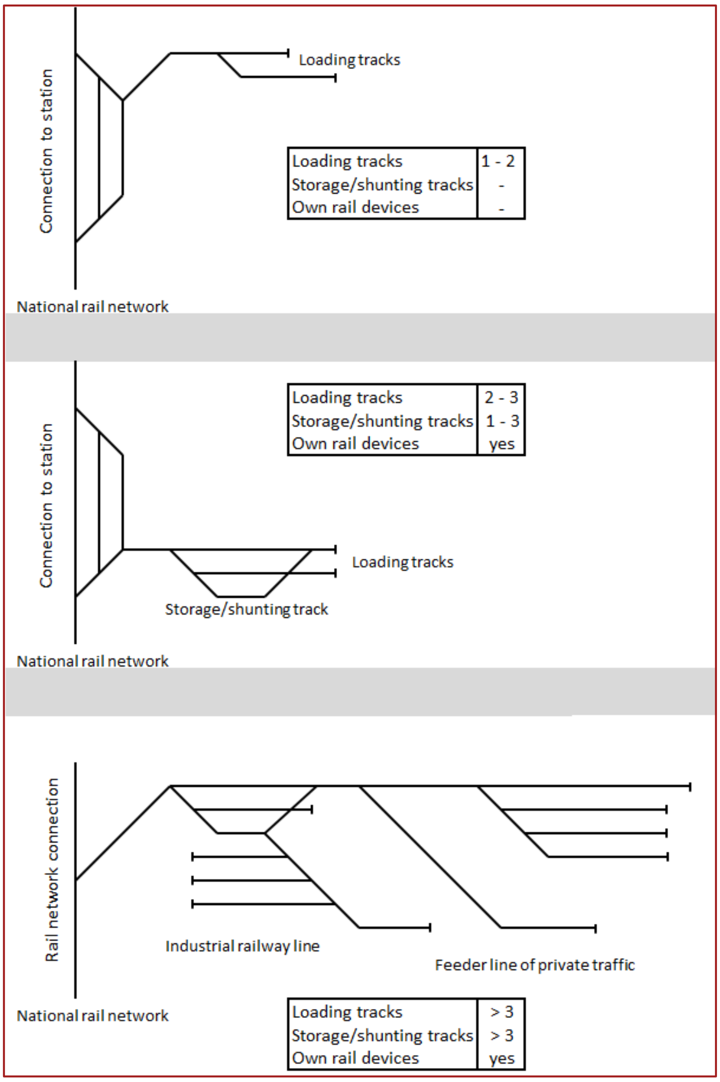
In order to specify the needs on investments in last-mile infrastructure (see chapter 4), it is important to understand that **"Last Mile Infrastructure" comprises a large variety of different infrastructure**

configurations associated with respective modes of operation. It is therefore necessary to define relevant clusters of last-mile infrastructure, which facilitate overview and allow addressing dedicated investment needs.

This clustering refers to the general understanding of last-mile infrastructure (see Figure 1) with the loading facility itself and further infrastructure components (transfer station, connecting line) required to ensure operation of the loading facility. Thus, the following four main types of last mile infrastructure have been identified as basis for the subsequent work steps:

- **Private sidings**: Private sidings are privately owned and operated pieces of rail infrastructure, connecting loading facilities (which are not part of the rail infrastructure) to the public rail network. Within this study, private sidings mainly refer to industry sites (manufacturing of goods). The layout configuration depends on the individual requirements of the respective customer. It might cover a wide range reaching from a simple loading track connection to complex rail networks (see Figure 3). Sometimes several private sidings are connected to a feeder track, which in turn is connected to the public network (e.g. in ports).

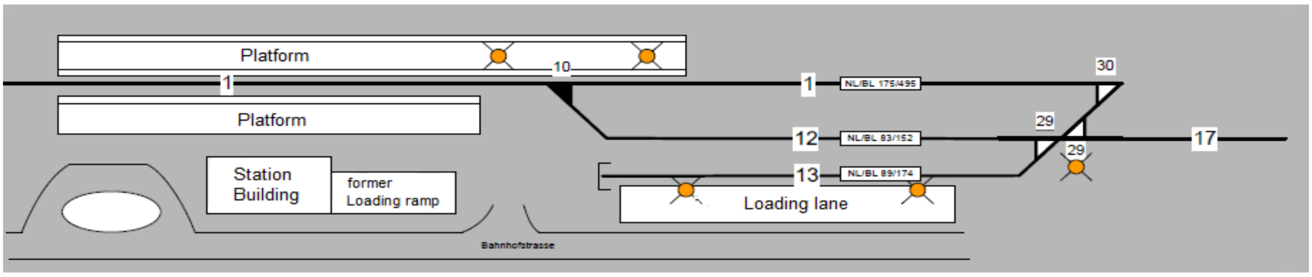
Figure 4 - Size range of private sidings



Source: HaCon

- **Stations with public sidings**: This category contains public accessible loading tracks, mostly located directly in public railway stations and owned by the respective infrastructure manager. Once, almost all railway stations used to provide this kind of rail access “for everybody”. Thus, the infrastructure often represents this historical status: rather short tracks, designed for single wagon traffic, enriched by a loading lane and a side/head ramp (see Figure 4) and adjusted to the formerly most often used types of freight wagons (class G, E, K). Nowadays, public loading tracks become more and more rare; their relevance is often restricted to few, dedicated types cargo (e.g. wood);

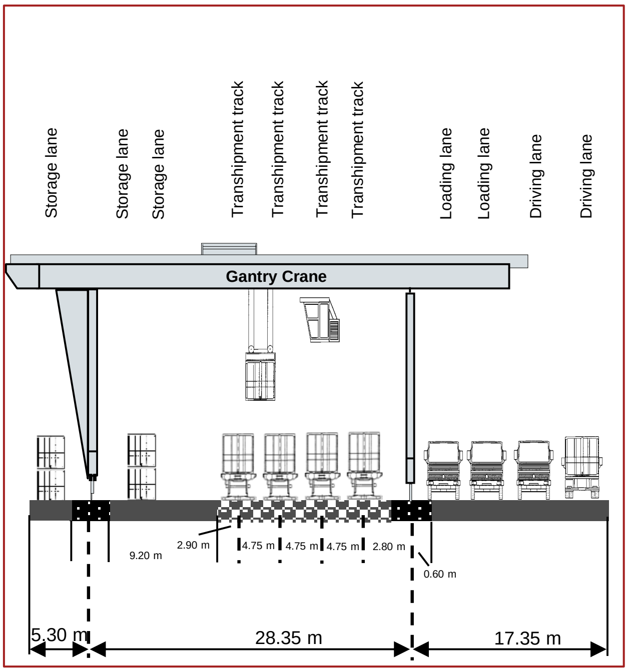
Figure 5 - Typical arrangement of a station with public siding



Source: DB Netze

- **Intermodal terminals**: Intermodal terminals are designed for transhipment of standardised loading units (containers, swap bodies, trailers) between at least two modes. In most cases they are public accessible, but some of them are privately operated (e.g. in seaports), sometimes even as private sidings. Within this study, only terminals with rail connection (rail/road or rail/road/water) have been considered. From the railway infrastructure perspective they consist of
  - A transhipment area with loading tracks, loading/driving lanes for the trucks and areas for (short term) storage of loading units and
  - Tracks for rail operation (train arrival/departure, train splitting/composing, wagon parking).

Figure 6 - Example for a “standard” transhipment module of an intermodal rail/road terminal



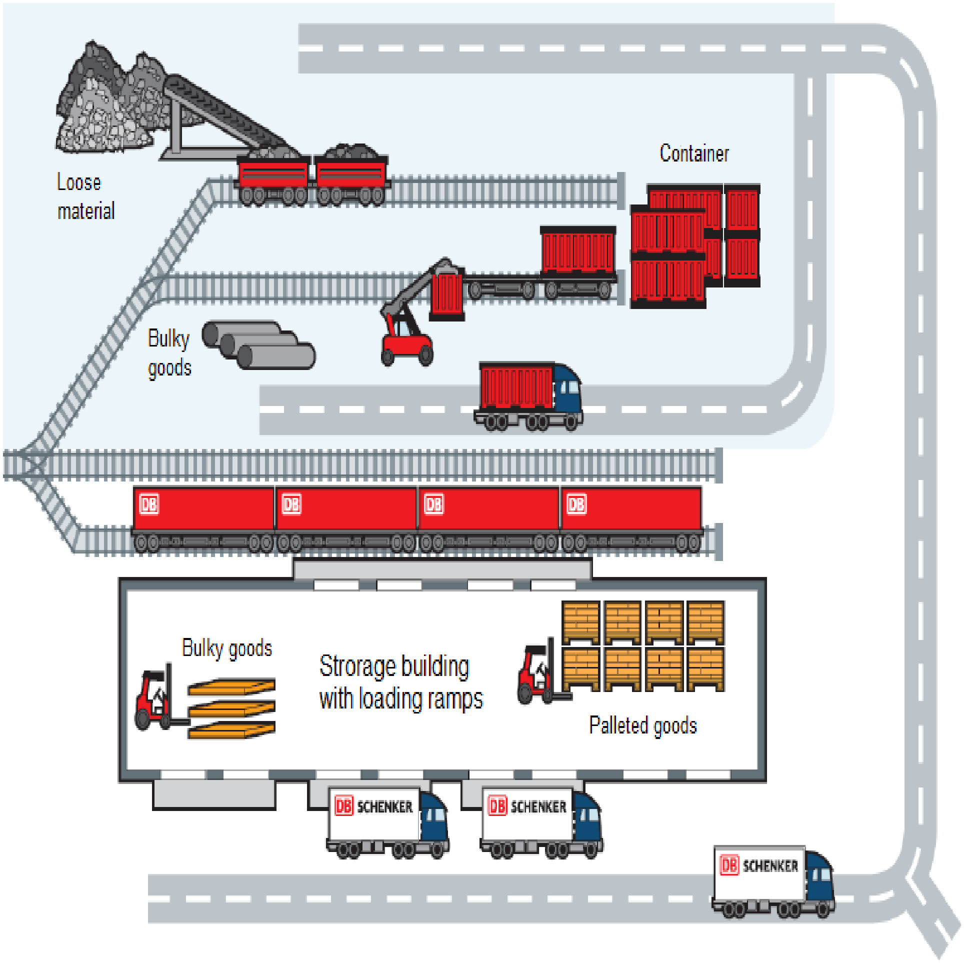
Source: DUSS

Main trends of intermodal transport show a clear tendency towards “industrialisation” with standardised operational procedures and infrastructure configurations (see also chapter 4.3.3.2.4);

- **Railports** are actually a brand name of DB Schenker Rail. In this study, the term stands for all kinds of rail/road transhipment stations except intermodal terminals (see above). In this respect, also expressions like "conventional terminal" or "rail logistics centre" are commonly used. In most cases, railports are operated either by railway companies directly or by their cooperation partners (e.g. forwarding companies).

  One main intention to establish railports was to substitute private and public sidings which were no longer served by rail. Thus, they are principally open for everybody and for all types of cargo. They do not only provide pure transhipment but also additional services like storage, consignment or road pre-/end-haulage (see Figure 6).

Figure 7 - Typical railport configuration and logistics services



Source: DB Schenker Rail

2. Stakeholder Engagement

2.1. Approach

The stakeholder consultation was based on the following phases:

- The **first phase** consisted in an open consultation aimed at gathering information to serve as an input - together with the results from the desk/web analysis - for the implementation of Task 1 and Task 2 of the study, focused on the **overview of the existing support programmes and instruments in European countries**.
- The **second phase** was targeted to gather relevant information to address main topics for Task 3 of the study (described into chapter 5) and all the quantitative relevant data for **Task 4** (described in chapter 4).

A third phase was be carried out to serve the dual purpose of fine-tuning the findings collected during the previous phases and refining the conclusions and recommendations from the Consortium.

The approach and methodology adopted for the development of the first phase of the stakeholder consultation is showed into Annex A2. Furthermore, given the relevance and complexity of the second phase of the consultation (strictly linked to the quantitative analysis of the study) the details about contents, response rate, and quantitative outcomes of the analysis are reported into the chapter 4, focused on the quantification of the investment needs.

2.1.1. Main contents

In the following table, a summary of the main contents/topics related to the stakeholder consultation phases are reported.

Table 9 - Contents of the stakeholder consultation

Driver	First phase	Second phase
Stakeholder information	• General information about the stakeholder (identification form, geographical area(s), operative sector(s))	• General information about the stakeholder (identification form, geographical area(s), operative sector(s))
Last mile support programme/infrastructure	• Overview and analysis of the existing dedicated programmes for investment in last mile infrastructure; • Overview and analysis of the existing non dedicated programmes for investment in last mile infrastructure; • Assessment of the most relevant programmes/instruments; • Comparative analysis of the identified support programmes/instrument	• Description of the last mile infrastructure (rail tracks, switches, operational infrastructure, transhipment facilities); • Recognition of the needs and requirements in order to define features and areas of interest to be covered by the guidelines; • Analysis of relevant market trends; • Deduction of the infrastructure and investment needs

The designed questionnaires for the first and second consultation are included in the Annexes B and C.

2.1.2. Broad range of stakeholders

The consultation was developed mainly through **online Questionnaires**[14], structured in a basic and "easy-to-fill" manner to reach a wide audience.

The following stakeholder groups were identified: **Industries, Industry associations at Country level, Infrastructure Managers, Logistic nodes/Freight villages' managers, Port Authorities, Railway associations and Rail – Road Terminal Managers**.

To enlarge the sample, the following **Associations** were also involved:

- European Rail Freight Association (**ERFA**);
- European Shippers' Council (**ESC**);
- European Association for forwarding transport logistics & custom services (**CLECAT**);
- International Union for Road – Rail combined transport (**UIRR**);
- European Sea Ports Organization (**ESPO**);
- Community of European Railway and Infrastructure Companies (**CER**).

In the following table, the total number of stakeholders identified for each Country is reported.

[14] The questionnaires are presented in Annexes B and C

Table 10 - Number of stakeholders for each States and cluster

Country	Industries	Industries (associations) at Country level	Infrastructure Managers	Logistic Nodes/Freight villages	Port Authorities	Railway Associations	Rail – Road Terminal managers
Austria	2	5	1	-	2	1	18
Belgium	2	7	1	-	9	2	53
Bulgaria	-	5	1	-	2	-	3
Croatia	-	1	1	-	2	-	5
Czech Republic	1	2	1	-	-	1	18
Denmark	-	3	1	-	10	-	4
Estonia	-	2	1	-	1	-	-
Finland	-	5	1	-	5	-	-
France	5	5	1	1	16	3	24
Germany	3	6	1	1	20	3	89
Greece	-	4	1	-	4	-	1
Hungary	-	4	3[15]	-	1	1	10
Italy	1	6	1	-	12	2	44
Latvia	-	-	1	-	2	-	1
Lithuania	-	1	1	-	1	-	3
Luxembourg	-	3	1	-	-	-	1
Norway	-	4	1	-	2	-	1
Poland	2	3	1	-	4	1	30
Portugal	-	4	1	-	7	-	2
Republic of Ireland	-	2	1	-	5	-	-
Republic of Macedonia	-	-	-	-	-	-	1
Republic of Serbia	-	-	1	-	-	-	2
Romania	-	3	1	-	8	1	17
Slovakia	-	3	1	-	1	1	12
Slovenia	-	3	1	-	1	-	6

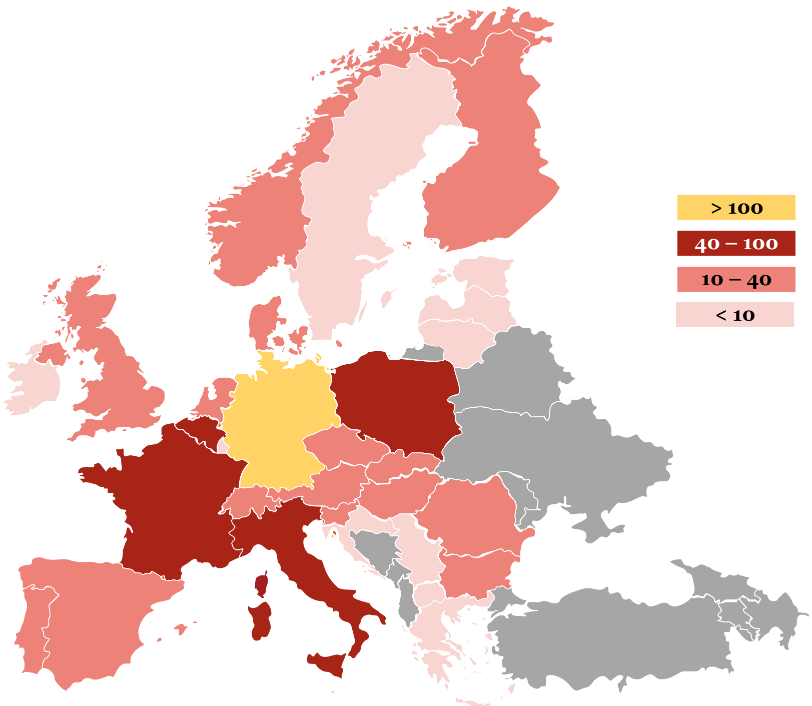
[15] The Hungarian Infrastructure Managers (IMs) are: MAV and GySEV. A third one laso has been considered as IM (VPE), although being the Hungarian Railway Capacity Allocator.

Country	Industries	Industries (associations) at Country level	Infrastructure Managers	Logistic Nodes/Freight villages	Port Authorities	Railway Associations	Rail – Road Terminal managers
Spain	-	6	1	-	13	1	9
Sweden	1	3	1	-	9	1	21
Switzerland	1	2	2	-	-	2	13
The Netherlands	4	6	1	-	6	1	13
United Kingdom	1	6	1	-	15	2	-
EU	18	-		1	-	4	-
TOTAL	**41**	**104**	**32**	**3**	**158**	**27**	**401**

As showed in the table above, the **Rail – Road Terminal managers** and the **Port Authorities** have been the most numerous clusters (they are almost always companies managing “individual” facilities), while infrastructure managers and industries have had a larger scope of activities.

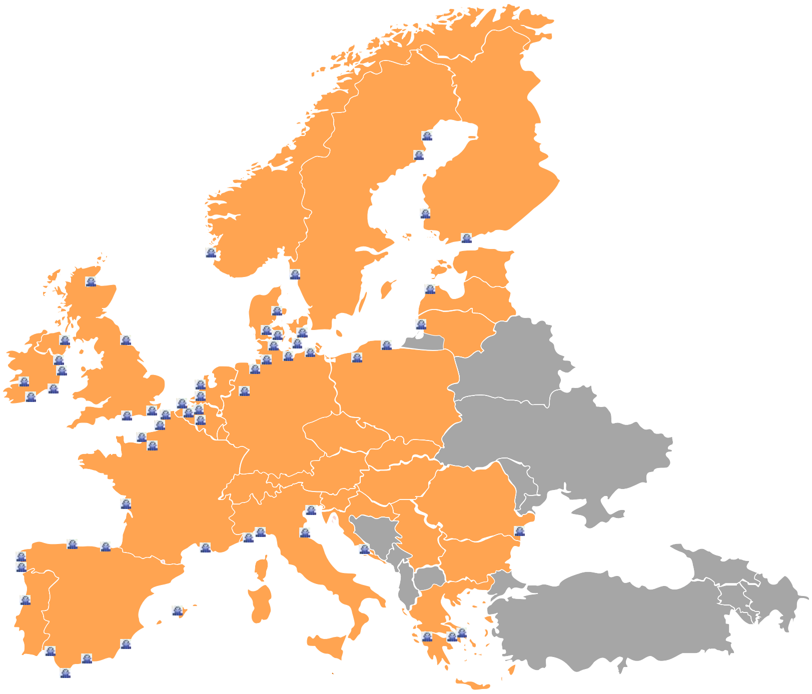
The following figure shows the **geographical coverage** of the identified (overall) sample of stakeholders.

Figure 8 - Number of identified stakeholders for consultation



More in details, in the following figure, the geographical coverage of the **Port Authority** cluster is reported.

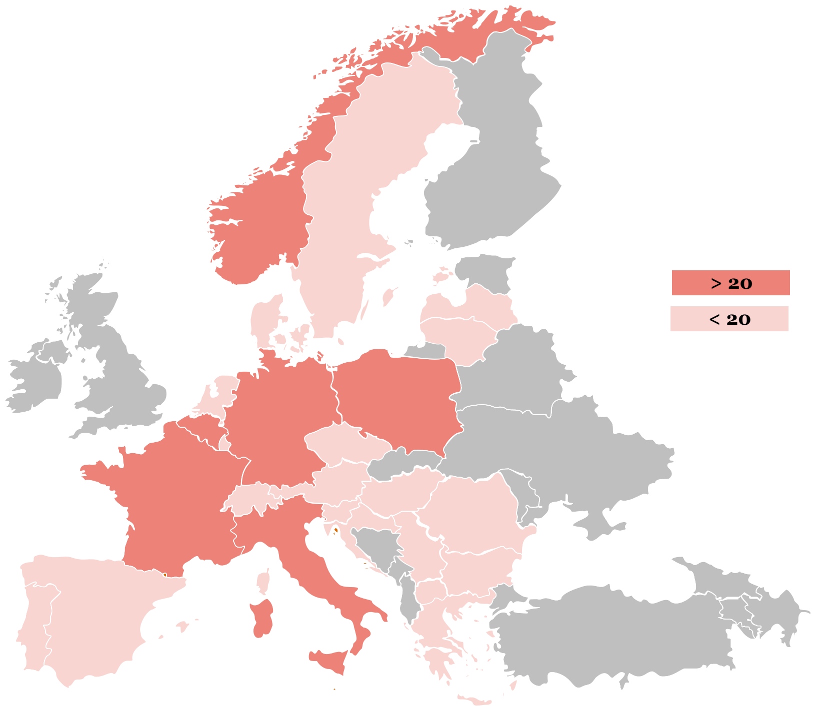
Figure 9 - Port Authority cluster



As showed in the above figure, **Germany** and **France** have registered the highest number of contact points (respectively 20 and 16 Port Authorities) followed by **United Kingdom, Spain and Italy**. In some cases (**Denmark, France, Germany, United Kingdom**), the Ports Associations have been involved to enlarge the sample of the consultation.

Moreover, in the following figure the geographical coverage of the **Rail/Road Terminal Managers cluster** is reported.

Figure 10 - Rail/Road Terminal Managers cluster



The highest number of Rail/Road Terminal managers were registered in **Germany, Belgium, Italy, Poland, France** and **Sweden**.

Further stakeholders have been identified for the online consultation, as reported in Figure 11 below.

Figure 11 - Other clusters identified for the stakeholders' consultation

		Industries	Logistic nodes	Railway associations	Associations
IT	Italy	Federchimica	-	ASSOFER FERCARGO	ERFA
DE	Germany	VCI BDI	-	VDV XRAIL	ESC
FR	France	ArcelorMittal GEFCO	-	AFWP EURORAIL	CLECAT
UK	UK	HTA	-	Rail Freight Group	UIRR
SE	Sweden	Skogsindustrierna	-	-	ESPO
BE	Belgium	Essenscia	-	AC Consult	CER
EU	European Union	CEPI ECG CEFIC FIEC EuroCommerce UECC	Europlatforms	EIM UIP ETF UNIFE UIC	

The Associations listed above were contacted in order to have a larger coverage of the options of the group of stakeholders they represent.

In the following table, the **response rate of the stakeholder consultation's phases** is reported:

Table 11 - Response rate of the stakeholder consultation

No. of questionnaires	First phase	Second phase

No. of questionnaires	First phase	Second phase
Sent	288	784
Received	39	53
Response rate	**14%**	**7%**

2.1.3. Focus on Key Countries

In parallel with the stakeholder consultation through the questionnaires, **interviews** were conducted mainly with those stakeholders responsible for the development, organisation and management of support programmes for investment in last-mile infrastructure: **Member States and/or the authorities in charge**. This ensured that other relevant information not covered by the questionnaires have been successfully collected and used for the purposes of the analysis.

Furthermore, stakeholders from such **key countries** have been selected on the basis of pre-determined evaluation criteria with the purpose of deepening the level of analysis, particularly in quantitative terms. This second restricted group was aimed to serve as an additional source of information to be interviewed for a deep investigation and fine-tuning of the main relevant topics.

The **key countries** selection was based on the criteria described below:

1) **Railway Network Index** (railway network density, number of TEN – T Corridors crossing the country);
2) **Industry Density Index** (number of enterprises[16], volume of goods transported by rail);
3) **Sidings Number Index** (number of intermodal terminals, number of private sidings, number of stations with public sidings, access points per 1,000 km).

The final selection was defined combining the performance of each country for the different criteria/indexes described above. Each index varied between 1 and 3, from the lowest to the highest performance of the country.

The details of the analysis are reported in Annex A1.

A breakdown of the results is presented in the table below.

[16] SME Performance Review, European Commission, 2013 - These are estimates for 2012 produced by London Economics, based on 2008-10 figures from the Structural Business Statistics Database (EUROSTAT). The data cover the "business economy", which includes, industry, construction, trade, and services but not enterprises in agriculture, forestry and fisheries and the largely non-market service sectors such as education and health.

Table 12 - Evaluation criteria for the key countries selection *(Source: EUROSTAT 2013, SME Performance Review – EC 2013, Statistical Data on Switzerland 2015)*

Country	Railway Network Index		Index [1÷3]	Industry Density Index		Index [1÷3]	Sidings Number Index				Index [1÷3]	TOTAL
	Railway density [m/km²]	N° of TEN – T Corridors		N° of enterprises (SMEs + Large)	Goods transport by rail [t]		N° of Intermodal Terminals	N° of Private sidings	N° of stations with Public sidings	Access points per 1000 km		
Czech Republic	121.35	3	3	1,008,527	83,957,000	3	21	1,242	244	158	3	9
Germany	115.75	5	3	2,211,752	373,738,000	3	154	2,395	475	74	3	9
France	43.34	3	2	2,602,866	88,989,000	3	72	1,500	332	65	3	8
Italy	55.4	4	3	3,697,484	87,960,000	3	46	762	199	61	2	8
Poland	61.81	2	2	1,477,893	232,596,000	3	35	2,016	414	123	3	8
Austria	68.13	4	3	308,377	95,400,000	2	21	716	107	153	3	8
Hungary	87.51	3	3	526,746	46,884,000	2	16	711	456	146	2	7
Belgium	117.73	3	3	521,544	55,876,000	2	49	484	113	184	2	7
Switzerland	124.11	2	3	557,800	64,999,000	2	33	1,300	401	339	2	7
Netherlands	72.53	3	3	803,522	38,927,000	2	27	337	10	138	2	7
United Kingdom	65.5	1	2	1,730,577	117,769,000	3	46	308	40	25	2	7
Romania	45.17	2	2	427,750	50,348,000	2	24	109	559	65	2	6
Spain	27.69	2	2	2,255,446	24,949,000	2	41	207	53	22	2	6
Slovakia	74.05	3	3	392,268	48,041	1	11	420	495	255	2	6
Sweden	24.89	1	1	666,815	67,330,000	2	34	584	180	72	2	5
Bulgaria	36.67	2	2	302,816	13,539,000	1	5	331	250	144	2	5
Latvia	28.78	1	1	87,802	55,831,000	2	6	484	162	351	2	5
Slovenia	59.64	2	2	115,809	17,156,000	1	3	182	223	338	2	5

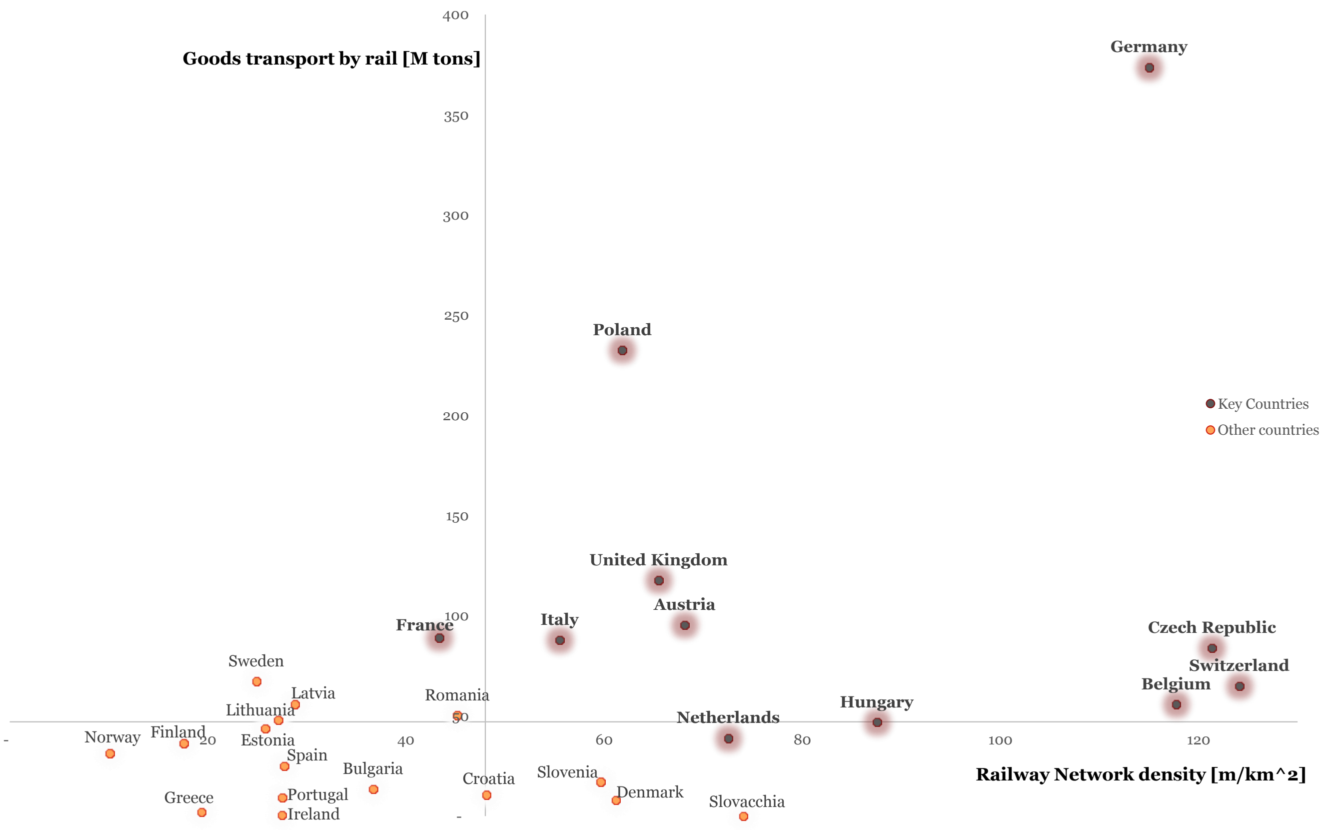
Country	Railway Network Index: Railway density [m/km²]	Railway Network Index: N° of TEN – T Corridors	Index [1÷3]	Industry Density Index: N° of enterprises (SMEs + Large)	Industry Density Index: Goods transport by rail [t]	Index [1÷3]	Sidings Number Index: N° of Intermodal Terminals	Sidings Number Index: N° of Private sidings	Sidings Number Index: N° of stations with Public sidings	Sidings Number Index: Access points per 1000 km	Index [1÷3]	TOTAL
Finland	17.56	1	1	222,619	36,443,000	1	17	172	224	69	2	4
Norway	10.1	1	1	282,392	31,429,000	1	19	234	50	78	2	4
Estonia	25.78	1	1	60,529	43,682,000	1	8	379	127	430	2	4
Denmark	61.17	1	2	213,475	7,956,000	1	11	69	29	36	1	4
Luxembourg	254.06	1	2	29,536	6,973,000	1	3	60	15	284	1	4
Lithuania	27.1	1	1	134,391	48,028,000	1	7	416	54	270	1	3
Croatia	48.1	1	1	146,292	10,661,000	1	8	92	211	114	1	3
Greece	19.34	1	1	654,367	1,980,000	1	3	17	99	47	1	3
Portugal	27.5	1	1	775,556	9,291,000	1	4	81	86	73	1	3
Republic of Ireland	27.48	1	1	144,798	589,000	1	6	5	2	7	1	3

As illustrated in the table above, the identified **Key Countries** have been:

1) Austria;
2) Belgium;
3) Czech Republic;
4) France;
5) Germany;
6) Hungary;
7) Italy;
8) Poland;
9) Switzerland;
10) The Netherlands;
11) United Kingdom.

In the following figure, the Key Countries are shown on the basis of two specific indicators: **railway network density** and **goods transported by rail.**

Figure 12 - Key countries



2.2. Outcomes from the first stakeholder consultation

As a result of the **stakeholder consultation** carried out during the **first phase of the study**, concerning respectively the identification, description and analysis of the existing dedicated support programmes in European countries as well as of other programmes/instruments at EU and National Level for financing and developing last-mile infrastructure (**Task 1 and Task 2**), **relevant themes, issues and needs emerged**.

In the following boxes, an overview of the outcomes of the first stakeholder consultation has been reported.

Existing dedicated supporting programmes	• Existing dedicated programmes/instruments specifically supporting investment in last-mile infrastructure have only been identified in **three European countries (Austria, Germany and Switzerland).**

In line with the main findings emerged from the *Single Wagonload Study* completed by PwC in 2014, the online survey identified three countries in Europe which are currently providing dedicated programmes supporting investment in last-mile infrastructure: Austria (***Programm für die Unterstützung des Ausbaues von Anschlussbahnen***), Germany (***Richtlinie zur Förderung des Neu- und Ausbaus sowie der Reaktivierung von privaten Gleisanschlüssen***) and Switzerland (***Aides financières pour voies de raccordement***).

Non-dedicated supporting instruments	• Several stakeholders have pointed out generic dedicated support programmes/instruments (e.g. **CEF**, **Discount for infrastructure usage of Single WagonLoad**, **Regional Operational Programme**, **Cohesion Fund**).

The online survey highlighted that other non-dedicated initiatives are present at EU level. Infrastructure managers in **Croatia** and **Portugal**, port authorities in **Italy**, for instance, underlined that under the **Connecting Europe Facility (CEF) scheme** it is possible to finance projects in order to build new tracks/facilities and rehabilitate or upgrade tracks/facilities. At the same time, in **Poland**, the railway associations stressed the utility of their **Regional Operational Programme** for financing infrastructure and environment projects. Finally, in **Czech Republic** several railway undertakings considered noteworthy the **Discount for infrastructure usage of Single WagonLoad**. In this case, the instrument supports railway undertakings operating Single WagonLoad trains and last mile (feeding) services and there are no alternatives to transport Single WagonLoad trains without the infrastructure discount.

Relevance of the programme/instrument

- **Several railway undertakings and port authorities** have highlighted that the identified instruments directly contribute to the rehabilitation or building of track facilities for last-mile infrastructure.

In **France, Germany, Poland** and **Switzerland** the relevance of the programme/instrument was focused on the building of new tracks/facilities and rehabilitation of tracks/facilities. Railway undertakings and port authorities stressed the contribution of the identified instruments to the improvement of the last-mile infrastructure performance.

Type of investments covered

- Most of stakeholders (**including infrastructure managers and logistic operators in France, Germany** and **Portugal**) have answered that the **investment covered tracks, signalling, switches, etc**. The federation of inland ports (**Germany**), instead, has reported that investments covered tracks only.

The investments covered under the instruments considered at EU and Member State level are normally concerned with the development of transport infrastructure, establishing a new multimodal transport system, research & development of transport infrastructures, etc. In other cases, the range of the EU programme is determined more broadly, by referring to investments in core transport infrastructure or, simply, transport infrastructure.

In **France, Germany** and **Portugal** the infrastructure managers and the logistic operators have stressed that the investments covered the building and maintenance of tracks, signaling, switches, etc.

Form of financing

- **Grants** are the most common type of support to investments in each country.

Most commonly funding is provided in the **form of grant**, where the financing body simply gives the beneficiary an amount of money depending on the share of eligible costs.

Best practices

- In some cases, stakeholders have recomended their instruments as **best practice**

This particularly in terms of: development of railway infrastructure (**Croatia**); improvement of the quality of goods transport by rail (**Portugal**); reduction of entry barriers for terminals of combined transport and terminal-related facilities supported by public funding (**Switzerland**).

Suggested improvements of the existing programmes

- In order to improve the identified instruments, stakeholders have reported some suggestions.

In the questionnaires, potential improvements of the existing programmes have been investigated. Indeed the point of view of each stakeholder represents the most important added value for increasing the effectiveness of the identified instruments.

France, **Germany**, **Poland** and **Portugal** have provided valuable suggestions. Firstly, in **France** the secondary lines (capillaires) account for 20% of the total rail freight tonnage, but the fund put in place by the Government in order to slow down the overall decrease of freight traffic does not support investments in private sidings. Therefore, the advice is to **extend the program to private sidings and intermodal platforms**.

Secondly, the German Railway Undertakings and Federation of Inland Ports have suggested simplifying the proposal and easing **the obligations connected to the scheme for enhancing/facilitating rail freight.**

Thirdly, the railway associations in **Poland** focused the suggestions on widening the scope of the instrument to all last-mile facilities (sidings, terminals, marshalling yards, cross-border infrastructure).

Finally, the infrastructure manager in **Portugal** has suggested to make expenditures related to land acquisition eligible.

Entity in charge

- **Most stakeholders indicated the Government department/Ministry as the main entity in charge of the support programmes,** while others the Regional authority/agency.

From the questionnaires, it emerged that the main entity in charge of the support programmes is established at Country level. In particular, stakeholders from **Croatia, France, Germany** and **Switzerland** indicated the **Government department/Ministry** as the main figure to manage instruments for investment in last mile infrastructure.

On the contrary, in **Poland** and **Portugal** stakeholders declared that the main entity in charge is the **Regional authority/agency**.

Assessment of the existing programmes

• Most of stakeholders highlighted that the identified instruments provided a benefit to their organisation in terms of: goods transported by rail and financial performance of the company.

In **Switzerland,** the infrastructure manager highlighted that the **dedicated instruments** for investments in last-mile infrastructure produced several benefits in terms of "goods by rail" and financial performance of the company. In particular, **within the period 1986 – 2013 the flow of "goods by rail" grew by at least 30%**.

In **Germany,** multimodal transport operators underlined that the approximate percentage of growth reached thanks to the **dedicated support programmes** was **15%**.

In **Croatia**, the rail infrastructure manager indicated that the **non-dedicated CEF programme (2006 – 2008, 2007 – 2013)** produced a positive impact in terms of transport flow and implication on the TEN – T Corridor. In this case, the approximate percentage of growth reached in goods transport by rail was **12,5%**.

In **Austria**, a railway undertaking highlighted that the **dedicated support programmes** (*Programm für die Unterstützung des Ausbaues von Anschlussbahnen*) produced some important improvements in terms of securing the existence of established sidings, checking existing and future industrial parks for the connection to the rail network and fostering the cooperative usage of existing infrastructure by companies. **The main goal of the programme is to foster modal shift from road to rail and IWW**.

In particular, the eligible projects are:
* purchase of special containers for land transportation;
* purchase of special wagons for intermodal transport;
* investments in new technologies.

Furthermore, the eligible costs are:
* investments in infrastructure, transhipment - and special - facilities;
* construction of buildings (if required).

In **Belgium**, port authorities stressed that the **non-dedicated interregional projects EFRO (2010 – 2014)** have generated benefits in terms of transport flow and financial performance of the company.

In **Czech Republic,** main railway undertakings highlighted that the **non-dedicated instruments (Discount for SWL trains)** have produced important benefits in terms of goods transport by rail with an average growth reached equal to **15%**.

In **Portugal,** the infrastructure manager has pointed out that the **non-dedicated POVT - Programa Operacional Valorização do Territóri (2007 – 2013)** has produced an approximate average growth in transport flows by **10%.**

The results of the activities carried out in the context of the tasks regarding the support-programmes/instruments in European Countries for financing and development of last-mile infrastructure have been used to feed the elaboration of the **Guidelines** (chapter 5) and **Recommendations** for the implementation, at Country and EU level, of dedicated support-programmes/instruments.

During the interviews conducted with **Member States**, stakeholders expressed mainly the following requirements:

Table 13 – Main needs emerged by the interviews with Member States and Infrastructure Managers

Country	Clarity on relevant European Regulation	Involvement of IMs for implementing an ex-post monitoring	Involvement of Regional authorities to develop traffic flows	More focus on innovation-related investments (e.g. IT systems)	More focus on intermodal platforms and all last mile facilities (e.g. terminals, marshalling yards, and cross-border infrastructure)	More clarity about the application process and more transparency about the administrative procedures for obtaining support
France	-	-	-	-	✓	-
Germany	-	-	-	-	-	✓
Italy	✓	✓	✓	✓	-	-
Netherlands	-	✓	-	✓	✓	-
Poland	-	-	-	-	✓	-

The table shows useful suggestions provide by several stakeholders during the first phase of the consultation and the meetings with national authorities and infrastructure managers. In particular, the most relevant theme was the necessity to **focus the attention of the support programmes on intermodal platforms and last-mile related facilities such as terminals, marshalling yards and cross-border infrastructure**.

This indication has come from the **Dutch Ministry of Infrastructure and Environment**, the **French infrastructure manager** and the **Polish railway associations**. The reasons are of various kinds.

Firstly, in France the secondary lines (capillaires) account for 20% of the total rail freight tonnage, but the fund put in place by the Government in order to slow down the overall decrease of freight traffic does not support investments in private sidings. Therefore, it would be useful to extend the program to private sidings and intermodal platforms. Secondly, the railway associations in Poland focused the suggestions on widening the scope of the instrument to all last-mile facilities (including terminals, marshalling yards and cross-border infrastructure). Finally, the Dutch Ministry underlined that Single Wagonload should be combined with Intermodal transport.

Another important need was to **focus on innovation-related investments (e.g. information systems)**. In this case, the Dutch Ministry has stressed that, more focus on innovation-related investments rather than on grants/subsidies for infrastructure, it could guarantee the achievement of the capacity levels. At the same time, the Italian railway infrastructure manager (RFI) has highlighted the necessity of using information systems to improve the performance of railway infrastructure.

The **involvement of the infrastructure managers** in order to do an ex-post monitoring of the investment was an important point to better understand the efficiency of the same investment.

Furthermore, the Dutch Ministry has confirmed that a monitoring programme regarding the performance of the last mile infrastructure would be useful to evaluate the past programmes influenced by the 2008/2009 economic crisis on the European freight transport sector. To do so, the **support of the Commission** in terms of economic resources and regulatory clarity is a priority.

Other themes emerged from the consultations are:

- The involvement of **Regional Authorities** to develop traffic flows for **territorial cohesion** (RFI);

- **Less bureaucratic inefficiency** when developing new last mile infrastructure links (RFI);
- **Implementation of an interoperable capacity management system** to monitor traffic flows (RFI);
- **Extension of eligible costs** to include expenditures related to land acquisition (Infraestruturas de Portugal, S.A);
- An **increased integration** of the different **last mile infrastructure managers** and **coherence** of their **development plans** (RFI);
- **Clear and exhaustive information** about the application process (German Railway Undertakings and Federation of Inland Ports).

The requirements that showed by several railway undertakings and logistic nodes' managers operating in the Italian ports deserve a special mention.

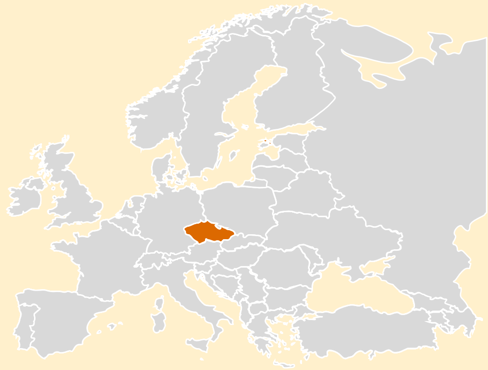
- Need for **more effective integration of the railway system with the port system**;
- Need for **measures for simplifying and promoting digitisation of the procedures** in order to develop competitive intermodal services;
- Need for **encouraging agreements among the railway undertakings**;
- Need for **reviewing the system for incentives**;
- Need for **extending the tracks to the terminal within the port**.

All these points reflect a common need to design features for support-programmes for investment in last-mile infrastructure to address the asymmetry of the rail freight system compared with the other transport systems.

In the following chapters, a specific focus was highligthed on past and ongoing initiatives in three Countries (Czech Republic, France and Poland) in which investments in last mile infrastructure are an important opportunity for rail freight development.

2.2.1. Case study: Czech Republic last mile investments

Case Study: Czech support programme for private sidings and rail terminal development



Description

A national support programme was set up by the ministry in charge of transport in 2008 to facilitate the creation and the modernisation of private sidings and rail terminals. This programme was available until 2012.

The general objectives of the programme were:

- To promote regional development specially for disadvantaged regions (possible level of grant was different according to Czech regions being max 40% for disadvantaged regions and 30% for other regions)
- To support modernisation of companies;
- To improve environmental protection and public health;
- To increase rail transport, allow a better organisation of flows;
- To reduce road traffic burden in regions.

For rail, it was planned to cover only investment on rail sidings or rail terminals. The objective was to raise freight tonnage carried on the national Czech territory by 10% and rail market share by 1,8 %.

Furthermore, the applicant had to demonstrate the effectiveness of the investment especially in terms of:

- Tonnage transferred to rail
- Tkm transferred to rail
- Decrease of carbon emissions
- Decrease of number of road accidents

Time frame: 2008 – 2013

Investments

The total available budget was 450 million CZK (about € 18 million) of which 85% from EU funds and 15% from National budget.

Outputs

In total, 6 projects were financed (100 million CZK, about € 4 million) of which one for conventional railfreight (a bioethanol plant) and 5 for the creation of privately owned intermodal terminals.

The programme was not considered as a success by the ministry for several reasons:

- Too much administrative work for the applicants and the ministry;
- Too lengthy process for definition of the project which is a complex and expensive project if compared to road connections and for decision;
- Funding from national budget made the process more difficult as national budget is a yearly budget and works could not begin before the formal agreement of the ministry in charge of Finance;
- Commitments about traffic volumes too high and difficult to reach for the interested parties.

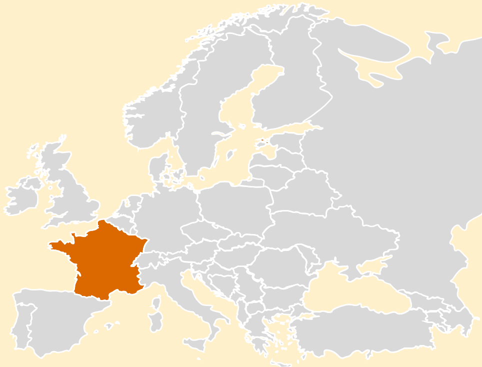
Ongoing initiatives

The Czech transport ministry are going to prepare a new support programme until 2020 that will be focused on intermodal only. The first call will be in autumn 2016.

2.2.2. Case study: France last mile investments

Case Study: France initiatives

Current situation



RFF was created in 1997 as infrastructure manager for the national railway infrastructure.

As such, RFF was in charge of managing and maintaining all railway tracks part of the national railway infrastructure and giving access to them to train operating companies. At the same time, SNCF was still owner of public sidings in stations considered by Fret SNCF as necessary for operations.

Recently, marshalling yards are managed by SNCF Réseau and the public sidings in stations as well as the land in stations are also now under SNCF Réseau management.

For private sidings, before 1997, SNCF as service provider was providing an allocation to private sidings owners. This allocation being to help maintenance of the private sidings and calculated according to tons carried by rail on the private siding.

At the same time, SNCF as infrastructure manager was asking to the private siding owner a rental fee calculated according to the type of railway line on which the private siding was connected. When RFF was created in 1997, rental fees were still asked by RFF, but SNCF no longer offered allocations.

Ongoing initiatives

Shippers and associations decided to join their efforts in order to be available the secondary lines and connections to private sidings for rail transport.

The State, the Regions, other local authorities and entities such as Chambers of Commerce were also involved.

For each case, working parties (between 20 and 40 persons) were created to evaluate the needs and find proper solutions to define necessary investments, calendar, budget and financing. These working parties were chaired by the State's representatives and worked for 12 to 24 months.

The State committed to provide € 30 million for 2015, 2016 and 2017 to renovate secondary lines, while other stakeholders did not commit. In average, funds were 1/3 State, 1/3 Regions and local authorities, 1/3 SNCF Réseau.

In many cases, shippers were asked to participate to funding the investment or to funding maintenance after line renovation.

It was estimated that for renovation of the secondary lines (about 1.400 km) and connections to private sidings on these lines would need € 140 million to € 150 million on 3 years or € 60 million more than the already available funds.

2.2.3. Case study: German last mile investments

Case Study: German initiatives

Description

The German government promotes the sustainable development of last-mile infrastructure for wagonload transport since 1998 and for intermodal transport since 2005. Unlike other national or European-wide funding programmes, the German funding system supports the construction and upgrading of access points to rail infrastructure in order to sustainably shift freight volumes from road to rail.

The funding programme for intermodal transport is based on the finding that terminals, which have been financed completely privately, are not competitive to road transport. In order to cope with the high construction costs, the private terminal operators would have to charge high transhipment fees, which in turn endanger the competitiveness of intermodal services, especially in transport distances below 400 km.

The relatively high funding rate of maximum 80% for intermodal terminals leads to a significant reduction of transhipment costs in inland facilities up to 22 € per loading unit. In the framework of the regular evaluations on the impact of the funding scheme, a remarkable shift from road to rail of some 2.3 Mio truck trips could be observed. In 2010, this led to a reduction of greenhouse gas emissions of 1.2 Mio tonnes. A funding volume of 500 Mio € between 1998 and 2010 enabled investments of 800 Mio € in 69 terminals. The achieved modal shift, CO2 savings and employment effects resulted in a benefit for the economy of 16.7 € for each funded Euro. In total the funding led to an increase of transhipment capacity in German terminals of some 4.5 Mio loading units.

The funding programme for private sidings was launched by initiative of shippers in Germany also considering the positive experiences with respective funding programmes in Austria and Switzerland. In the contrast to the funding of terminals, which have to guarantee a discrimination-free access for all potential users, the funding programme for sidings exclusively supports last-mile infrastructure which has been built by the respective operator. Thus, the maximum funding rate has been limited to 50%. In addition, siding operators applying for the funding programme have to prove the planned modal shift effect. Between 2004 and 2010, the funding achieved an avoidance of 450 Mio truck trips or 10 Mio tonnes of greenhouse gas emissions per year. A funding volume of 48 Mio € enabled investments of 130 Mio €. The achieved modal shift, CO2 savings and employment effects resulted in a benefit for the economy of 25.5 € for each funded Euro.

Findings

The evaluation of the German support programmes showed that a sustainable shift of freight volumes from road to rail has been achieved by focusing on last-mile infrastructure. Hence, both German programmes are being continued, based on updated and EU-conform regulations. The evaluation also demonstrated that without the respective funding of the last-mile infrastructure, the development of the rail transport volumes would have been significantly lower. This applies to both the wagonload as well as the intermodal transport. In particular the latter shows a remarkable potential for the future development.

Compared to intermodal transport, the wagonload market has a significant share of 82% (2013) and is - despite the negative trend in the single wagon load segment- still the backbone of the European rail freight market. Especially the wagon group and block train segment shows a considerable development potential. For the years 2011 to 2025 it is estimated that in around 450 sidings in Germany construction measures will be necessary. In this context, innovative solutions for multifunctional sidings (e.g. Railports) will play an increasing role. Thus it is recommended to develop and implement last-mile infrastructure related funding programmes also on European level.

2.2.4. Case study: Poland last mile investments

Case Study: New railway law

Current situation

Group PKP is the successor to the previous State railway enterprise. It covers:

- PLK as the infrastructure manager of the national railway infrastructure;
- PKP SA as the holding still owner of parts of the railway infrastructure;
- PKP Cargo as the raifreight service provider (Train operating company) and its subsidiary PKP Cargo Services as the service provider on public and private last mile sidings.

Poland has to transpose the Directive 2012/34/EU and as such has to clearly define railway infrastructure, national one but also local one for access to essential facilities (public sidings in stations for manoeuvres and/or storage, freight terminals, marshalling yards, railway infrastructure in sea and river ports, infrastructure for access to fuel facilities, etc).

Private sidings are railway tracks owned by a company, built on their own premises and have to connect to national railway infrastructure. If such private sidings can serve other companies, the owner of the private siding has to provide access with no discrimination.

Public sidings are mainly in stations. They are part of the national railway infrastructure managed by PLK or are still with PKP SA and in this case have to connect to the national railway infrastructure. PLK and PKP SA have both to provide access to every train operating company and to this aim may conclude rental agreements.

Public and private sidings are now considered in Poland as very important for the development of railfreight. In particular, public sidings ensure all train operating companies offering railfreight services in Poland access to the railway infrastructure without having to invest in their own railway infrastructure. Private sidings ensure companies efficient raifreight services.

Ongoing initiatives

The new railway law should be ready before summer 2016 after consultation. The new law will define railway infrastructure components: national infrastructure, infrastructure for access and use of essential facilities, public sidings, and private siding.

UTK, the Railway Directorate in Poland, participates to the preparation of the new railway law and is in charge for preparing the definitions and consulting about them.

UTK is also responsible for the creation of the national infrastructure register that will include information about public and private sidings to be possibly used. UTK will also be responsible for disseminating the information for railway infrastructure in general as well as PLK for national railway infrastructure.

PLK, the national infrastructure manager recently created a working party to know better the situation in Poland with public and private sidings, to identify needs for possible new developments and support new railfreight activity.

PKP Cargo and PKP Cargo Services are developing joint approaches to provide adapted and efficient railfreight services from end to end.

In particular PKP Cargo Services is proposing services on public and private sidings going from creation, modernisation, maintenance, operations, certification. PKP Cargo Services consider that the needs for modernisation of such facilities represent high investment as companies'needs differ now from what they were in the past.

3. Programme/instrument in EU

For the purposes of the present study, the existing **“dedicated support-programmes”** have been considered as all the schemes **specifically set up by European countries** – either at country, regional or local level – with the aim of **building, extending, reactivating and maintaining last-mile infrastructure**. An extended definition of the term may include also broader support programmes **with part of the budget exclusively for last-mile infrastructure** or envisaging other conditions on this kind of investment project (e.g. funding granted only to investment with a compulsory minimum percentage of last-mile infrastructure).

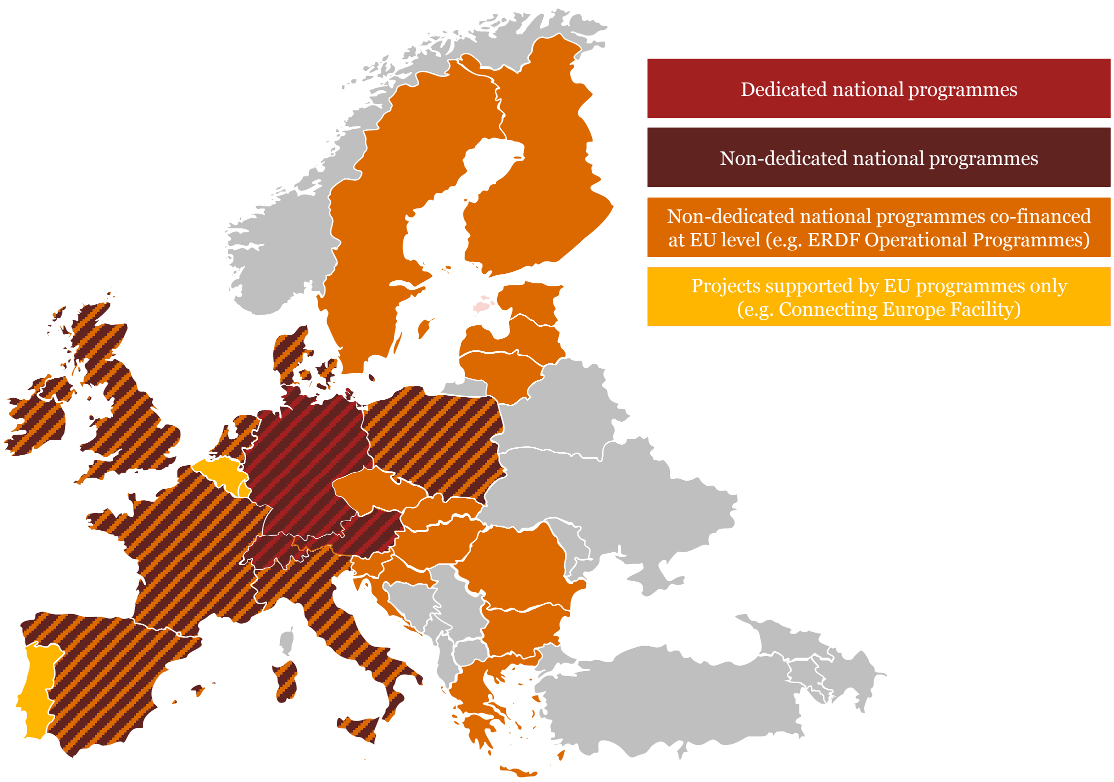
As for **“non-dedicated programmes”**, instead, a variety of instruments available both at national and EU level have been considered which were **not specifically set up** to support investment in last-mile infrastructure, but that **could be used** for such purpose.

A wide range of programmes is currently available to support transport infrastructure across Europe, from more generic and broader scope to more specific ones. In this context, the **Hungarian Operational Programme “Transport”** has been summarised in the chapter 3.2.5 since the Hungarian authorities notified to the Commission a specific State Aid scheme about the last mile infrastructure (more details are reported into chapter 5.2.5.1).

However, **only few countries have introduced dedicated support programmes for last-mile infrastructure**.

Indeed, only **Austria, Germany and Switzerland** are currently offering dedicated last-mile support schemes (see Figure 13). In the rest of Europe, instead, last mile infrastructural projects can be supported by non-dedicated national programmes, national programmes co-financed at EU level (e.g. ERDF Operational Programmes) or receive assistance from EU instruments (e.g. Connecting Europe Facility).

Figure 13 – Overview of last-mile support programmes across Europe



3.1. Existing dedicated support-programmes/instruments

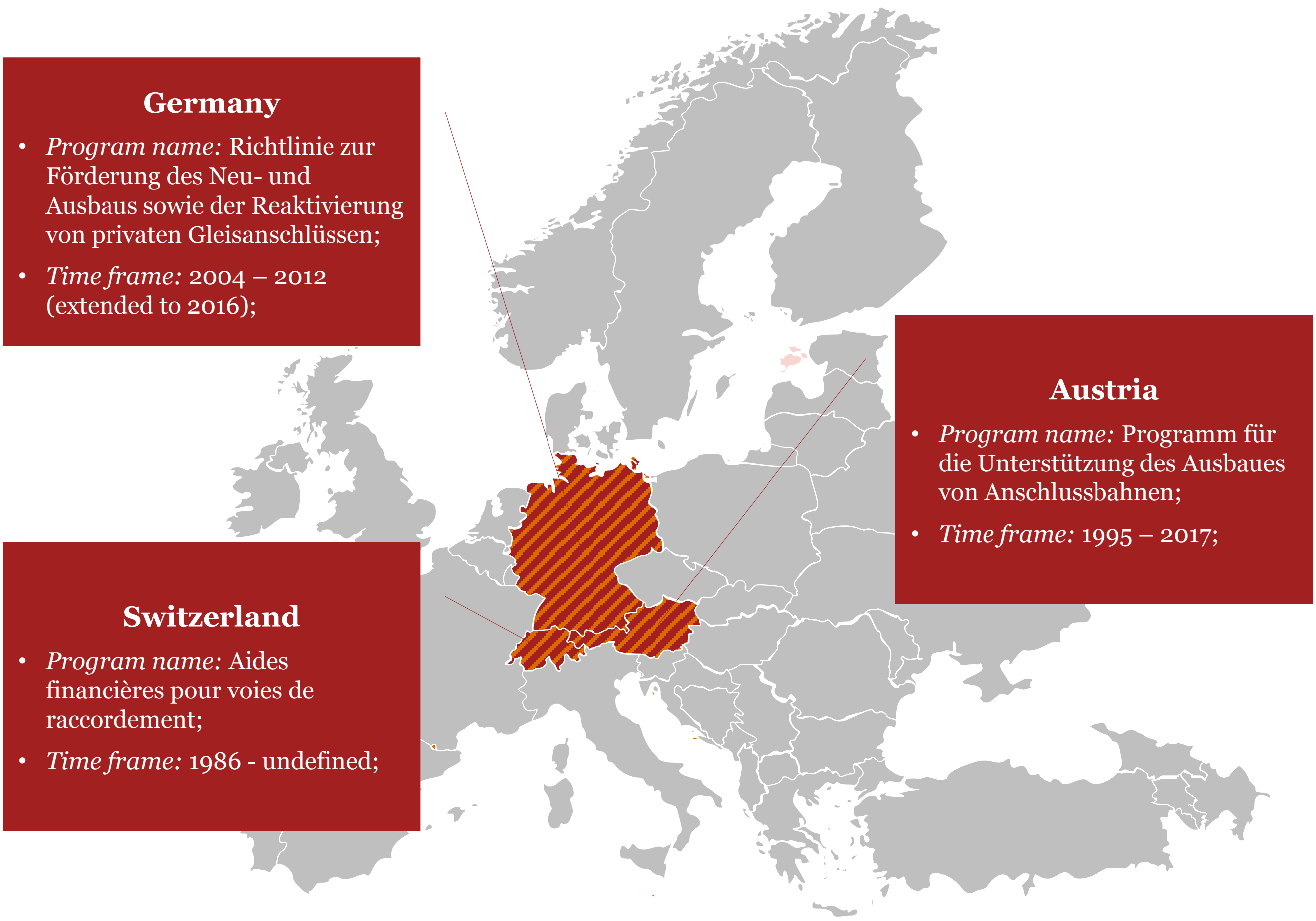
Supporting the development of last-mile infrastructure is of paramount importance to boost competitiveness, economic growth and sustainable development within the EU. Investing in last-mile infrastructure is about providing the private sector (e.g. industries, commercial enterprises, shippers, etc.) with a **safer**, **greener** and **more efficient logistic alternative to road transport**. Such a development could lead to different benefits ranging from the **abatement of road congestion, pollution** and **greenhouse gas emissions** to the **reduction of costs** both for individuals and for the society as a whole.

In line with the main findings emerged from the *Single Wagonload Study* completed by PwC in 2014, **three countries in Europe** are currently providing dedicated programmes supporting investment in last-mile infrastructure:

- **Austria** (*Programm für die Unterstützung des Ausbaues von Anschlussbahnen*);
- **Germany** (*Richtlinie zur Förderung des Neu- und Ausbaus sowie der Reaktivierung von privaten Gleisanschlüssen*);
- **Switzerland** (*Aides financières pour voies de raccordement*).

For more details, see Figure 14 below.

Figure 14 – Dedicated national programmes in Europe



Austria

In Austria, last mile funding schemes for manufacturing and trading companies have been established by the Ministry of Transport (BMVIT) since the late '90s (see Notifications on State Aid 2000-2006, 2007-2012). Today, funding for last-mile infrastructure is provided by the BMVIT on the legal basis of State Aid "SA.34985 (2012/N) – Österreich". The timeframe of the funding scheme currently in place is five years (1st January 2013 – 31st December 2017), while the funding agency is SCHIG mbH, a 100% subsidiary of BMVIT.

Funding focuses on the **construction, extension and reactivation of sidings**, which may include investments in rail infrastructure, superstructure and machinery (cranes, forklifts, etc.). **Potential beneficiaries** of funding are **private companies** with substantial inbound-outbound cargo flows, currently using trucks as their main means of transport and looking for alternative ways to satisfy their transportation needs. The proximity to suitable public railway infrastructures and the availability of rail cargo operators able to service the location at competitive prices are crucial prerequisites for funding.

Given the economic structure in Austria, **only a limited number of companies** do generate transport volumes justifying regular operations of block trains/semi-block trains (i.e. annual cargo volumes higher than 500,000 tons). **The majority of shippers** – due to the size of the generated flows - usually make use of **wagonload services** either by shipping, receiving single wagons or groups of wagons, which is generally more cost-intensive.

Germany

In order to increase rail freight, and in particular promote the shifting of freight transport from road to rail, the Federal Government decided to financially support the **construction, reactivation and expansion of private railway sidings**. Indeed, after the expiry of the previous Directive of 3 August 2004, a new Directive on the promotion of the construction, extension and reactivation of private sidings has come into force **since 21 September 2009**.

The body in charge of granting subsidies is the **Federal Railway Authority**, the German supervisory, licensing and safety authority for railways and railway undertakings that is part of the Federal Transport Administration. In order to benefit from the subsidy, the sidings to be built or renovated **have to be directly or indirectly connected** to the national railway network.

Switzerland

In Switzerland, the availability of sidings is of strategic importance for ensuring an efficient inbound and outbound of wagonload transport. Every year, approximately **1.6 million wagons are loaded on and unloaded from Swiss sidings** – corresponding to 33 million tons of goods – which account for the **90% of total wagonload transport** in the country, excluding transit traffic.

To enhance the competitiveness of rail freight traffic compared to road transport, the Federal Government contributes to the development of sidings by financing **their construction, expansion and renovation**. The aim is to address the shortage of capacity and contribute to the further growth of freight transport by rail.

In accordance with the federal law on sidings and the related ordinance (OBR) potential beneficiaries – respecting the eligibility requirements set out in the regulation – can apply in order to obtain financial aid in the form of repayable contributions.

Time frame

The above-mentioned dedicated programmes have been put in place **at different times in the last decades**, with **Switzerland** being the **first country** (1986) to offer financial support in this sense. **Austria** implemented a dedicated instrument **9 years later** (1995) and Germany followed the **same period of time** (2004).

Unlike the last two mentioned countries (Austria and Germany), which programmes are **planned to expire – if not renewed** – between 2016 and 2017, Switzerland **did not formally establish the end of the time-horizon** within which investment projects in sidings infrastructure may be considered to receive financial assistance from the Confederation.

United States

Apart from the European context, the research performed under the present study focused also on the U.S. experience in the field of rail infrastructure support programmes, this being a relevant market in terms of infrastructure endowments and public resources made available. However, no evidence was found of the presence of dedicated programmes specifically set-up to support last-mile projects as those available in Europe (Austria, Germany and Switzerland). On the contrary, only general and broader-purpose programmes revealed to be present in the country, as detailed in the box below.

Programmes supporting rail infrastructure investments in the United States

In the U.S. freight rail infrastructure are funded almost entirely by the private sector: rail maintenance, replacement, and expansion of track, structures and equipment by "Class I railroads" - those with annual operating revenues of over $250 million - is almost entirely financed by the income from private companies' operations. On the contrary, smaller and regional freight rail infrastructures tend to be the major beneficiary of state funding.

As far as last-mile support programmes are concerned, the research revealed that no dedicated schemes are currently in place in the country. Indeed, last-mile infrastructure as rail sidings may receive financial aid from broader-scope programmes either at Federal[17] (e.g. Federal Grants, Federal Rail Loans and Tax Credits, etc.) or State level[18]. In the latter case the State may develop rail plans funded by the State's resources (e.g. taxes) but also utilize federal funds to take forward rail projects (e.g. Revolving Loans).

3.1.1. Key aspects characterizing the existing programmes/ instruments

The analysis of the schemes presented before revealed that in all cases financial aid is provided for the **construction, extension/modernisation and reactivation** of railway sidings. Some of the key aspects characterising the identified dedicated programmes include the **share of funding** that can be obtained by the applicant (expressed as a percentage on the eligible costs), the **minimum-maximum thresholds** for granting aid and the **form of financing** adopted.

As shown in Table 14, the share of funding that can be allocated to the construction, extension or reactivation of sidings varies between **25% and 50% in Austria**, between **40% and 60% in Switzerland**, while in **Germany** may reach **up to 50%** of the eligible costs. Austria and Germany set the **same minimum project threshold** for granting funding (€ 15,000) **significantly lower** than in the Swiss case (€ 28,892)[19].

Table 14 - Key aspects of the existing programmes

Country	Share of funding - % eligible costs:	Minimum project threshold	Maximum project threshold		Form of financing
			New construction	Extensions/Renewal	
Austria	25% to 50%	€ 15,000	€ 2.5 million per project	€ 2 million per project	Non-repayable grants
Germany	Up to 50%	€ 15,000	€ 8 per tonne/year or € 32 per 1,000 tonne-km/year	€ 6 per additional tonne/year or € 24 per additional 1,000 tonne-km/year	Non-repayable grants
Switzerland	40% to 60%.	€ 28,892	The maximum federal co-financing is limited and cannot exceed € 29 (30 Swiss francs) for each tons transhipped annually through sidings, and € 4.235 (4400 Swiss francs) for each metre of "mother siding" (this term identifies tracks linking the main network with several sidings).		Non-repayable grants

As far as the maximum project threshold is concerned, Austria and Germany **set different ceilings on the basis of the type of intervention** for which the application is submitted, which may concern the **new construction** or the **extension/renewal** of existing sidings. In the first case, the Austrian authority provides a maximum budget per project **equal to € 2.5 million**, while in Germany each project related to the construction of sidings may **not receive more than € 8 per tonne/year** or **€ 32 per 1,000 tonne-**

[17] US Department of Transportation – Federal Railroad Administration. Accessible at: www.fra.dot.gov
[18] Texas Transport Institute – University Transportation Center for Mobility. Accessible at: http://utcm.tamu.edu/tfo/rail/
[19] Taking into consideration an exchange rate EUR-CHF of 1,0385 (Source: Bloomberg; accessed May 6th, 2015)

km/year as funding. In the second case – the extension or renewal of sidings – Austria set a financial aid threshold of **€ 2 million per project**, while in Germany the support may **not exceed € 6 per additional tonne/year** or **€ 24 per additional 1,000 tonne-km/year**.

Switzerland, instead, set a **unique maximum threshold** for financing either the construction or extension/renewal of sidings that cannot exceed **€ 29**[20] (30 Swiss francs) for **each tons transhipped annually** through sidings, and **€ 4,235**[21] (4400 Swiss francs) for **each metre of mother siding**. Please note that the term "mother siding" identifies tracks linking the main network with several sidings. In all cases, financing is provided exclusively in the form of non-repayable grants.

Potential beneficiaries and prerequisites for funding

In Austria, **beneficiaries** of the dedicated last-mile funding scheme are **companies with a production or distribution site** located in the country. Companies that, as of today, benefitted from grants were mainly belonging to the paper, wood, lumber, waste recycling and - more generally - primary production industries.

In Switzerland, **potential beneficiaries** of funding for the development of **connecting sidings** are the **owners of private connected sidings, groups of interest, consortia**, etc. Beneficiaries of grants for the development of **"mother sidings"** (tracks linking the main network with several sidings), instead, may be **municipalities** or **owners of private connected sidings**. **Engineering offices** and **shippers associations** acting on behalf of the owners of connected sidings may also apply for funding if duly endowed **with power of attorney**.

Each of the above-mentioned programmes has specific requirements for the candidates' eligibility for financing. For instance, the German programme guidelines **define some assessment questions** that – if answered correctly – may indicate the opportunity of an eventual **funding request** by the Federal Government.

3.1.2. Comparative analysis

The comparative analysis focused on the method envisaged by each instrument for calculating financial assistance and the related specific conditions for the disbursement of the aid.

In Austria, **no specific method is followed** to calculate financial support as eligible costs are **"simply" multiplied by the respective share of co-financing** (from 25% to 50% depending on the type of eligible costs), which provides the amount of funding that can be granted by the Government to the project. In Germany, instead, funding is calculated on the basis of the **additional traffic expected to be generated** on the sidings covered by the intervention – which may concern their construction, extension or reactivation – and without which such increase **would not have occurred**.

In Switzerland the calculation depends on the **typology of sidings concerned**, that can be either **private** or **public**. Indeed, while the contribution to private sidings is a **function of the volume to be transported**, financial support to public ones depends on the **number of connected sidings** covered by the project. To this regard a **minimum of two sidings** have to be declared eligible for the financial aid to be granted. For instance, the construction of private sidings may receive a financial contribution equal to 50% of eligible costs if the volume to be transported along them reaches 400.000 tonnes per 24.000 wagons, whereas to receive the same quota of financial aid in case of public ones 4 connected sidings have to be involved (see Annex D).

When considering the extension and renewal of sidings, the **additional volume** to be transported is the **key driver** for defining the **amount of financial aid**. In particular, the **difference** between the **average volume transported** during the last three years prior to the intervention and the one **expected after it** is considered. If the volume remains unchanged, the financial aid will correspond to 40% of the eligible costs. It will instead increase by 1% for any 5% increase in the volume to be transported. If the eligible costs are above average, financial aid might be increased by maximum 5%, provided that the applicant cannot influence the causes of higher costs (e.g. they shall be due to municipal taxes, length of the sidings, geology, etc.).

[20] Taking into consideration an exchange rate EUR-CHF of 1,0385 (Source: Bloomberg; accessed May 6th, 2015)
[21] Taking into consideration an exchange rate EUR-CHF of 1,0385 (Source: Bloomberg; accessed May 6th, 2015)

Table 15 – Method of calculation and conditions for funding

Country	Method of calculation	Eligibility conditions	Monitoring conditions
Austria	• Funding intensity depends on the investment measures the applicant proposes. No specific method is applied; • Eligible expenses are multiplied by the corresponding funding quota to determine the maximum funding volume that becomes part of the subsidy contract.	• Decrease of road transport (tons of cargo shifted from road to rail p.a., saved tKm road transport, reduction of CO2 Emissions); • The ex-ante definition of cargo volumes serviced by the siding is mandatory in the application phase.	• Once funding is granted, the 5-year traffic monitoring becomes an integral part of the subsidy contract.
Germany	• Funding is a function of the expected additional traffic generated on the sidings; • The construction, extension or reactivation of railway sidings must entail an actual, substantial, measurable and sustainable transport of freight by rail that would not otherwise have occurred.	• The applicant shall demonstrate the expected traffic performance (traffic in tonnes and tonne-km per annum on German railways) and the commitment to its achievement.	• The granting authority checks compliance with the annual transport volume in the 5-year period. By the end of the fourth year of the 5-year period it may be extended (at request) to 7 years; • In case of non-compliance with the planned transport volume, the funding has to be repaid back in proportion. The applicant shall provide a bank guarantee or an equivalent warranty to secure the repayment of the obligation.
Switzerland	• The contribution to private sidings is a function of the volume to be transported while for public sidings it depends on the number of connected sidings (at least two sidings have to be eligible to receive financial aid). • The volume to be transported is defined generally in tonnes or number of cars if they weight is less than 16.7 tonnes on average.	• Grants are available only for sidings with a traffic volume of at least 12,000 tonnes/year or 720 wagons/year.	• The Federal Office of Transport monitors the transport performance on the siding for 5 years from the start of the operations; • Full repayment of the grant is required when, within 5 years from the completion of the project, the siding is not operating (despite the authorization) or the minimum traffic volume threshold of 12,000 tonnes/year or 720 wagons/year is not reached; • Except for cases of permanent abandonment of a siding, a 5% annual interest rate is charged on the amount to be repaid;

Country	Method of calculation	Eligibility conditions	Monitoring conditions
			• The Confederation reduces its financial aid when, together with other public contributions, it exceed the 90 % of the eligible costs.

In all three instances, funding is conditional upon **respect of certain requirements**. In Austria it is of primary concern that the intervention will **positively affect modal shift** from road to rail transport, which consequently leads to a reduction of road congestion (tonnes of cargo saved on yearly basis) and CO2 emissions. Moreover, during the application process it is considered mandatory the **ex-ante definition** of cargo volumes serviced by the siding, as well as a 5-year monitoring by the competent authority once funding is granted.

Similarly, an applicant to the German support programme shall **demonstrate the expected traffic performance** resulting from the implementation of the intervention (traffic in tonnes and tonne-km per annum on German railways) and a **realistic commitment to its achievement**. As for the previous case, the granting authority checked compliance with the annual transport volume over a 5-year period, which may be extended - at request and at the end of the fourth year - to 7 years.

As specified in the regulation of the German scheme, in case of non-compliance with the transport undertakings – possibly emerged during the 5 to 7 year period – **funding has to be repaid back in proportion**. In addition, the applicant shall provide a **bank guarantee** or an **equivalent warranty** in order to secure the repayment of his obligation.

In Switzerland funding is available **only for sidings connected to stations** or **lines** with a traffic volume of **at least 12,000 tonnes/year** or **720 wagons/year**. The volume to be transported, used as a function for calculating financial assistance, is defined generally **in tonnes** or **number of cars** if the weigh is less than **16.7 tonnes on average.**

The Federal Office of Transport monitors the freight transport performance (volume to be transported) on the siding for 5 years from the start of operations. In case within this period, the siding **revealed to be not operating**, despite the authorization provided in this sense, or the **minimum traffic volume threshold** of 12,000 tonnes/year or 720 wagons/year is not reached, a full repayment of the financial aid will be required.

Moreover, except for cases of permanent abandonment of a siding, a **5% annual interest rate is charged** on the amount to be repaid. Finally, the Confederation shall reduce its financial aid when, together with other public contributions, it **exceeds the 90 % of the eligible costs**.

As far as the **cost eligibility** criteria are concerned, a comparative assessment of these schemes showed that some common categories of costs are generally considered eligible or non-eligible by the three instruments, with a few limited exceptions.

As mentioned earlier, all the schemes provide financial aid to the construction, but also renovation and extension of sidings. Apart from these basic costs, Austria, Germany and Switzerland finance also the **expenditures for the railway systems necessary to operate the sidings**, although in the German case the systems for managing internal traffic are **normally excluded from support** (see Table 16). Costs for loading/unloading facilities and equipment are eligible **in the Austrian and German schemes only**, while Switzerland considers these expenditures, which may include for instance ramps, loading platforms, pallets, handling facilities and cranes, **as non-eligible for co-financing**.

Table 16 – Eligibility matrix: eligible and non-eligible costs (non-exhaustive list)

Cost items	Austria	Germany	Switzerland
Construction of sidings	E	E	E

Cost items	Austria	Germany	Switzerland
Expenditures for the railway systems necessary to operate the sidings	E	E (excluding systems for managing internal traffic)	E
Loading/unloading facilities and machinery	E	E	NE (e.g. ramps, loading platforms, pallets, handling facilities, cranes, etc.);
Repair and maintenance of all kinds	NE	NS	NE
Land acquisition	NE	NE	NE
Switches	NE	NE	NE
Costs incurred before the application	NE	NE	NE
Leasing-funded facilities and equipment	NS	NE	NS

Legend: E=Eligible; NE=Non-eligible; NS=Non-specified.

Finally, the findings highlighted that **some categories of costs**, including expenditures for repair and maintenance, land acquisition, switches and – as a rule – all the costs incurred before the application **shall not be considered eligible**. In addition, the German programme excludes from support **all the facilities and equipment** financed by **means of leasing**, while it was not possible to verify such detail in case of Austria and Switzerland.

3.1.3. Evaluation of the existing dedicated support-programmes/instruments

The data provided in the section below should be considered as **preliminary findings** uniquely gathered from the **bodies in charge** of the **Austrian and Swiss schemes' implementation**. More complete and thorough information to this regard will be provided at a later stage of the study, once the **interview process** involving the most relevant **users of the infrastructure** covered in the past by the dedicated programmes will be **successfully completed**. Nevertheless, irrespective of the findings collected during the above-mentioned consultation phase, the final evaluation of the programmes in quantitative terms will be in any case complicated by the **impact of the 2008/2009 economic crisis** on the **European freight transport sector**, since this factor had **relevant disturbing effects** on the **transport performance figures** that are still clearly perceptible today.

Austria

Concept Evaluation

When shifting freight traffic from road to rail in Austria, the body in charge of the national dedicated programme **has drawn attention** on the following problems:

- A fierce competition of the road freight transport sector;
- The "Cherry-Picking" of private rail operators with non-traditional cost structures erodes financially viable market segments of the former - state owned - monopolist Rail Cargo Austria (RCA). As a result, RCA has to deal with the increasingly problematic market of single wagonload traffic, which in turn is highly relevant for industrial sidings.

More generally, some of the **criticalities encountered** during the implementation of the dedicated programme – as pointed out by the authority – include:

- Failure of the beneficiary to meet the contractual obligation in terms of annual cargo volumes (as agreed upon in the subsidy contract), which led to the repayment of the subsidy;
- Cost increases for the rail operator;
- Lack of railway operators able to provide service at a reasonable price;
- Bankruptcy of the beneficiaries.

According to the Austrian authority, the projects funded by the dedicated programme started to **deliver tangible benefits** as soon as the sidings built, extended or renovated started to **enter in operation** and the **administrative burden and costs** triggered by the programme revealed minimum, standing **below the 2%** of the annual funding volume.

Impact evaluation

Between 1999 and 2013, **360 applications** for funding were received by the BMVIT, **350 of which** were successfully approved, providing a very high ***success rate* equal to 97%**. National authorities stressed that the slight discrepancy was related to the fact that few finalized subsidy contracts **were not accepted in the end** by the beneficiaries of funding.

In monetary terms, approximately **€ 210 million were disbursed** as funding out of a total funding volume of more or less the **same size**. Successful candidates, instead, received grants which average size amounted to **€ 575,000.**

Since the condition to receive subsidies include the obligation for the beneficiary to **prove the shipment of certain annual cargo volumes** over a period of 5 years, the national authority was able to estimate that – between 1999 and 2013 – an average volume of **40 million tons of freight** were transported on industrial sidings every year.

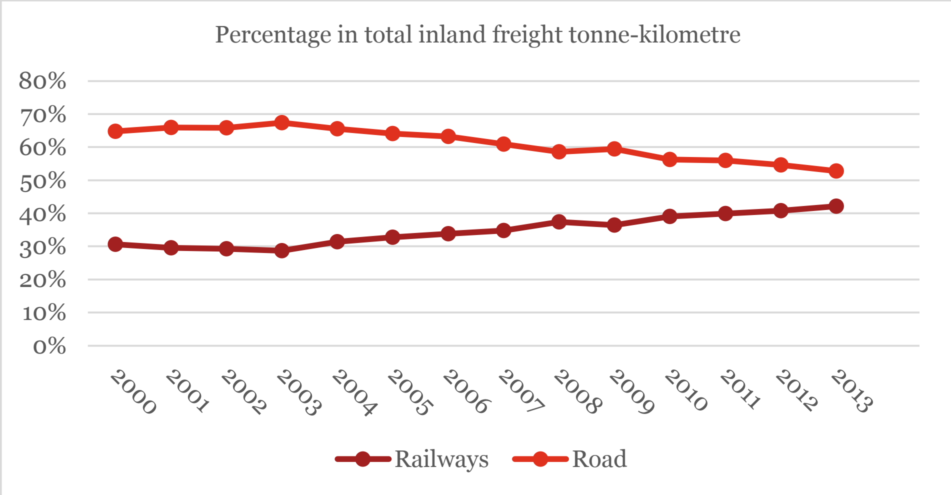
More specifically, in 2013 **ca. 95.4 million tons of freight were transported by rail** in Austria out of a total (road and rail freight transport) of **420.8 million**, which is equal to **23%**. Approximately **50%** of such volume (47.7 million tons) **passed through the industrial sidings** that benefitted from the dedicated funding scheme.

Freight traffic analysis – Modal split

In Austria, the share of freight transported by rail and road in the period 2000-2002 remained substantially stable (see Figure 15)**. Since 2003, however, the modal split quota has constantly varied in** favour of rail transport, **increasing from approximately** 30% to more than 40% **in 2013. The share of freight road transport, instead, decreased accordingly – in a symmetrical manner – from 67% in 2003 to 53% in 2013.**

Figure 15 – Modal split of freight transport in Austria (2000-2013)[22]

[22] Source: Eurostat Database (2015)



The dedicated scheme *Programm für die Unterstützung des Ausbaues von Anschlussbahnen* is **not the only one to support and facilitate** road-to-rail modal shift in Austria, as the Ministry of Transport (BMVIT) provides funding also through:

- Service contracts with cargo operators (single wagon traffic, unaccompanied combined transport, *"Rollende Landstraße" (RoRo)*, approx. € 100 million p.a.);
- Subsidy Contract §42 ÖBB-G: approx. € 700 million p.a. for infrastructure operation (including shunting services);
- Additional programmes for investment in transport containers, semitrailers, etc.

Therefore, while the funding granted through the Austrian last-mile dedicated programme **cannot be considered as the only cause** of the growth in the rail freight modal split quota, the former **is likely to have contributed** towards a growth of the latter.

Germany

Concept Evaluation

The German Federal Ministry of Transport and Digital Infrastructure analysed the funding programme for private railway sidings from January 2005 to the end of December 2015.

Impact evaluation

According to the programme, the Ministry **fund up to 50 % of the eligible investment in the building and development of private railway sidings**.

In particular, **a total amount of 55,5 Mio. additional tons of goods on rail** has been reached and the traffic performance came up to 18,1 billion tkm.

Furthermore, the number of truck drives has been strongly reduced to the amount of about 2.524 (total) or 561.083 truck rides per average per year.

Switzerland

Concept Evaluation

As far as the qualitative evaluation of the scheme is concerned, the Federal Office of Transport (Bundesamt für Verkehr - BAV) of the Swiss Confederation questioned to this regard stated that:

- No specific criticalities were encountered during the implementation of the dedicated programme;
- No additional administrative costs resulted to be related with the programme;

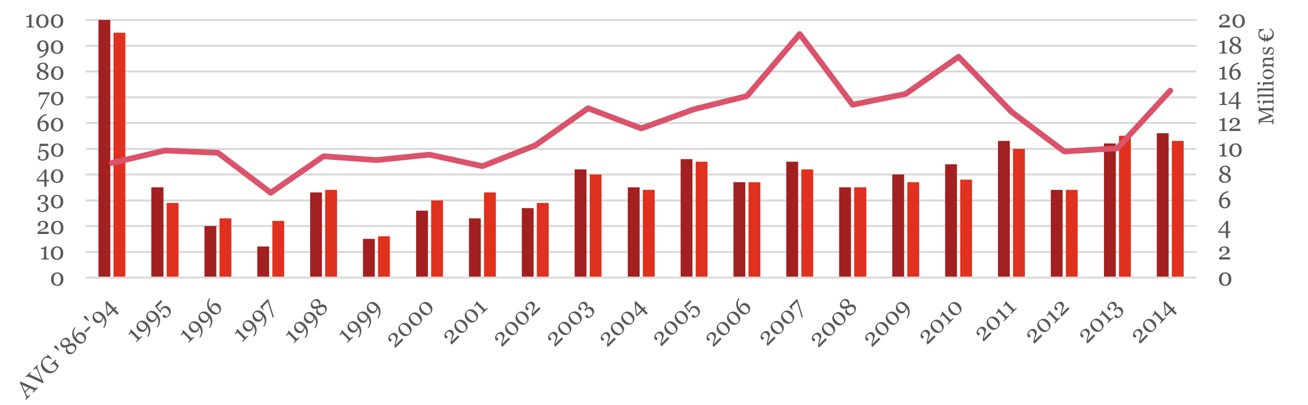
- Shift of freight traffic from road to rail was the most significant and tangible benefit provided by the scheme.

Impact evaluation

From the analysis of the time series provided by Swiss BAV, the financial aid for the development of private sidings in the country proved to be **more or less stable in the period 1986-2000**. Since 2001, however, it started to **grow at a sustained rate**, reaching a **first peak in 2007**, **a second - less intense - peak in 2010** and then **falling abruptly until 2013**. Between **2013 and 2014** the total amount of funding granted has **catch up remarkably**, matching the 2008 level (see Figure 16).

In the period 1986-1994, a **significant number of applications** for funding were received and approved on yearly average basis, nearly double compared to the 2014 level. However, the total volume of subsidies granted in the same period **revealed to be in line with** the level of financial support provided in the following decade, meaning that the **average grant size** in the initial time frame was considerably lower. It should finally be noted that the number of applications for funding received and approved on yearly basis between 1995 and 2014 **varied discontinuously**, although it **increased in the long run**.

Figure 16 - Swiss Confederation's financial contribution to private sidings in nominal values (1986-2014)[23]



The Swiss dedicated programme – since its establishment in 1986 – **received 1,508 applications** for funding, **1,473 of which were successfully accepted**. The ***success rate*** in this case revealed to be almost maximum, as it **equals 98%**. In monetary terms, **ca. € 275 million were committed** to the construction, extension and renovation of sidings, ca. **€ 245 million of which** were successfully disbursed as funding. Finally, the average grant size revealed to be **equal to € 166,231**.[24]

Freight traffic analysis – Modal split

Switzerland, due to its strategic geographical position, **plays a key role** in the European transport network. Indeed, a relevant share of international goods transport between northern and southern Europe goes over **Swiss alpine passes**. In 2012, the volume of goods transported by road and rail over the passes reached **37.4 million net tonnes**, more than twice the amount recorded three decades before, when the Gotthard tunnel was first opened.

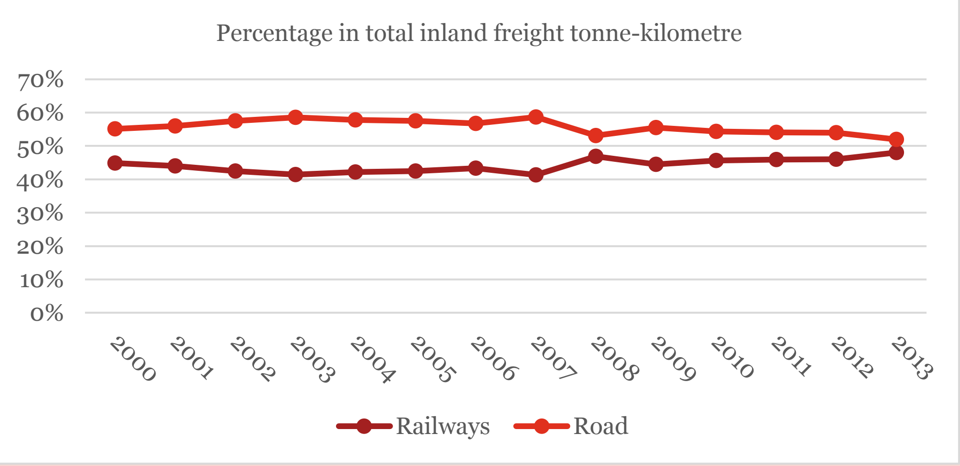
Unlike other neighbouring countries (e.g. Austria, France, etc.) **transalpine goods transport** is - for the most part - **done by rail**, with a quota of net tonnes transported over the alpine passes that **reached 63% in 2012** (out of the total traffic). Even more significant is the **share of combined transport in rail transport**, which rose **from 17% in 1981 to 71% in 2012**.[25]

When considering the overall freight movements on the Swiss territory, in the last decade the modal split of freight transport **developed slightly in favour of rail** (compared to road), with a share that grew from about **45% in 2000 to 48% in 2013** (see Figure 17).

[23] Source: Swiss Confederation, Federal Office of Transport, Financing Division (Bern, 30 December 2014)
[24] All the values in Swiss Francs were converted into Euro applying the average annual exchange rates covering the period 1986-2014
[25] Source: Swiss Confederation, Federal Statistical Office (FSO) website 2015 Accessible at: http://www.bfs.admin.ch/bfs/portal/en/index/themen/11/05/blank/04.html

Such **limited increase**, however, occurred for the most part **in the 2007-2008 period**, does not seem to be **random** but related to the **outbreak of the economic crisis**, which very likely led to **a decrease in freight transport by road** (more sensitive to changes in the macro-economic context) and the consequent **increase in the relative rail freight share**.

Figure 17 - Modal split of freight transport in Switzerland (2000-2013)[26]



According to the Federal Authorities, **around 90% of freight traffic in Switzerland** (about 32 million tons per year) **transits via sidings**, which is a remarkable figure that confirms the strategic importance of such infrastructure for the country. However, in the absence of further information in this respect, it is difficult to **evaluate the extent to which** the country's dedicated last-mile support scheme contributed to the modal split performance figures shown above.

Indeed, the authority which has competence in the matter and which is authorized to monitor the transport performance of the beneficiary established before granting the aid can only verify the relative positive impact of the dedicated schemes in traffic growth and modal shift terms.

Comparison and conclusions

As of today, **Germany has a number of private sidings (2.395) which is higher compared to Austria (716)** and **Switzerland (497).** Accordingly, the **yearly average funding** provided by the dedicated program in this **former country** for the construction, extension or renovation of private sidings **revealed to be higher** (+72%) with respect to the **latter one**.

In Germany, the total amount of funding has been **€ 95,2 million** and the number of applications that have been approved was 126.

However, the **number of applications** for funding received and approved **on average every year in Switzerland** revealed to be **more than double** compared to the number recorded in **Austria**. As a result, the **average size of the grants** provided by the Swiss dedicated program resulted to be **approximately three times lower (€ 166,231)** when compared to the average aid granted by the Austrian one.

As far as the ***success rate*** is concerned, calculated as the ratio between the number of applications submitted and approved, it resulted to be **almost equal in both countries** (97% in Austria and 98% in Switzerland).

Table 17 – Summary impact evaluation of the programmes

Evaluation items	Austria	Germany	Switzerland
Time Frame considered	1999 - 2013	2004 – 2015	1986 - 2014

[26] Source: Eurostat Database (2015)

Evaluation items	Austria	Germany	Switzerland
No. private sidings	716	2.395	497
Overall funding volume	Ca. € 210 million	€ 250 million	Ca. € 275 million
Overall funding disbursed	Ca. € 210 million	n.a	Ca. € 245 million
Funding disbursed (Annual average)	15 million €/year	n.a	8.7 million €/year
Average grant size	€ 575,000	€ 756,000	€ 166,231
No. applications received	360	n.a.	1508
No. applications approved	Ca. 350	126	1473
No. applications approved (Annual average)	25	n.a	53
Success rate	97%	n.a	98%

Drawing from experience in the evaluation of financing schemes in the transport sector, some **preliminary positive issues were envisaged** for each of these cases, as for instance:

- Definition of **minimum/maximum project thresholds** and *sine qua non* conditions for the disbursement of funding;
- Clear and exhaustive **identification of the eligible and non-eligible costs** (e.g. repair and maintenance, land acquisition, costs incurred before the application, etc.).

Moreover, some additional **key elements emerged** that could be taken into consideration as **relevant issues** when **developing future EU guidelines**. Among the critical aspects and limitations of existing programmes, the more important ones appear to be related to ex-ante evaluation and ex-post monitoring of the effectiveness of the projects. As follows, a preliminary list of **critical aspects, limitations and possible solutions** were also envisaged for each of these cases.

Table 18 – Summary evaluation of relevant issues, critical aspects, limitations and solutions

Relevant issues	Critical aspects and limitations
Ex-ante evaluation of the potential benefits resulting from the project (e.g. volume of freight traffic shifted from road to rail, reduction in CO2 emissions, etc.);	Potential benefits may be under- or over-estimated;
Ex-ante evaluation of the traffic growth estimates triggered by the investment and included in the application form;	Risk of over-estimated freight traffic projections;
Ex-post monitoring of traffic performance on the sidings subject to intervention for a determined number of years since the start of operations;	Unforeseeable external circumstances (e.g. macro-economic conditions, natural disasters, industrial accidents) affecting traffic performances shall not be neglected to understand actual evolution;
Proportional reduction of the grant when other public sources provide financial aid to the project;	Some beneficiaries in below-average GDP countries (e.g. MS under the Convergence objective) are most in need of financial support;
Full/partial repayment of the grant (with possible interest charging) in case the performance criteria were not successfully met (except for proven exceptional circumstances).	Potential bankruptcy of the beneficiary.

Finally, for reasons of clarity and comprehensibility, the **key findings** emerged from the **desk research** on last-mile dedicated programmes in Europe were **summarised** in the following box:

Key findings

- Dedicated programmes supporting last-mile infrastructure are currently available in three European countries: **Austria, Germany and Switzerland**. All the schemes provide subsidies, in the form of **grants**, for the **construction, reactivation and extension** of railway sidings;
- In **Austria** the programme's **beneficiaries** are generally **privates**, while in **Switzerland public bodies may also benefit** from funding **under the condition** that the project concerns **"mother sidings"** (tracks linking several sidings to the main rail network);
- In **Germany and Switzerland** the method for calculating financial assistance is **performance-based** (e.g. freight volume to be generated or transported on the sidings), while in **Austria** subsidies are simply calculated **multiplying eligible costs by the respective co-financing quotas** set out in the programme. A full/partial **repayment of the grant** is required when the **undertakings are not honoured** by the beneficiary;
- The body in charge of the Austrian dedicated programme pointed out that **some criticalities were encountered** during the **implementation of the scheme**, while according to the **Swiss authority no evidence was found** that this should be the case;
- **No clear causal or "cause effect" link** could be established **between the funding provided by the Austrian and Swiss dedicated schemes** to railway sidings projects and the **freight traffic modal shift performance** (from road to rail) recorded in the respective countries;
- In **Austria and Switzerland**, the ***success rate* of the programmes** – calculated as the ratio between the number of applications submitted and approved – **resulted to be very close to 100%.**

3.2. Other programmes/instruments at EU and national level

This section is focused on the programmes and instruments existing at EU and Member States' level, which are **not dedicated** to last-mile railway infrastructures, but which could (potentially) used for financing last-mile infrastructure. Unlike the previous section (3.1), the research carried out for identifying non-dedicated or ancillary programmes/instruments required adopting a **broad scope**. More specifically, it aims at covering and analysing a broad range of instruments and programmes to assess their relevance for last-mile infrastructure.

In this paragraph, the identification and analysis of non-dedicated programmes and instruments **in 26 Member States** (Cyprus and Malta have been excluded as not having railway infrastructure) have been described, as well as at **EU level**. *Rationae temporis*, the study considered programmes and instruments available from 2007 onwards. The main reason for this choice was to gain more concrete insights into how the various programmes and instruments, which are being implemented or have been implemented in the Member States and at EU level, were relevant to last-mile. The distribution of the EU programming periods (i.e. 2007-2013 and 2014-2020), facilitated in structuring the analysis of the EU level programmes and of the various Operational Programmes available in the Member States.

This study also considered the relevant **policy context** encompassing initiatives towards revising last-mile infrastructures at EU level and within the Member States. As regards the **EU level**, the 2011 **Commission's White Paper on EU transport policy**[27] covers initiatives related to last-mile infrastructure, such as EU measures foreseen to promote clean freight transport, increase rail safety through maintenance of railway infrastructures, and create multimodal freight corridor structures, ensuring increased modal shift of freight transportation from road to rail and promoting clean freight transport modes in ports and industrial sites. As for the **Member States**, many programmes or instruments are in place that could be used for last-mile infrastructure. Austria is an exemplary country as regards the development of policy initiatives and programmes covering last-mile. In Austria, there is a National Transport Infrastructure Development Plan for the period 2013-2018, which unique feature is that it is designed basing on a Transportation Forecast 2025+ adopted also by the Federal Ministry of Transportation, Innovation, and Telecommunication.

3.2.1. CEF project-based last-mile development for Core Network of ports and rail-road terminals

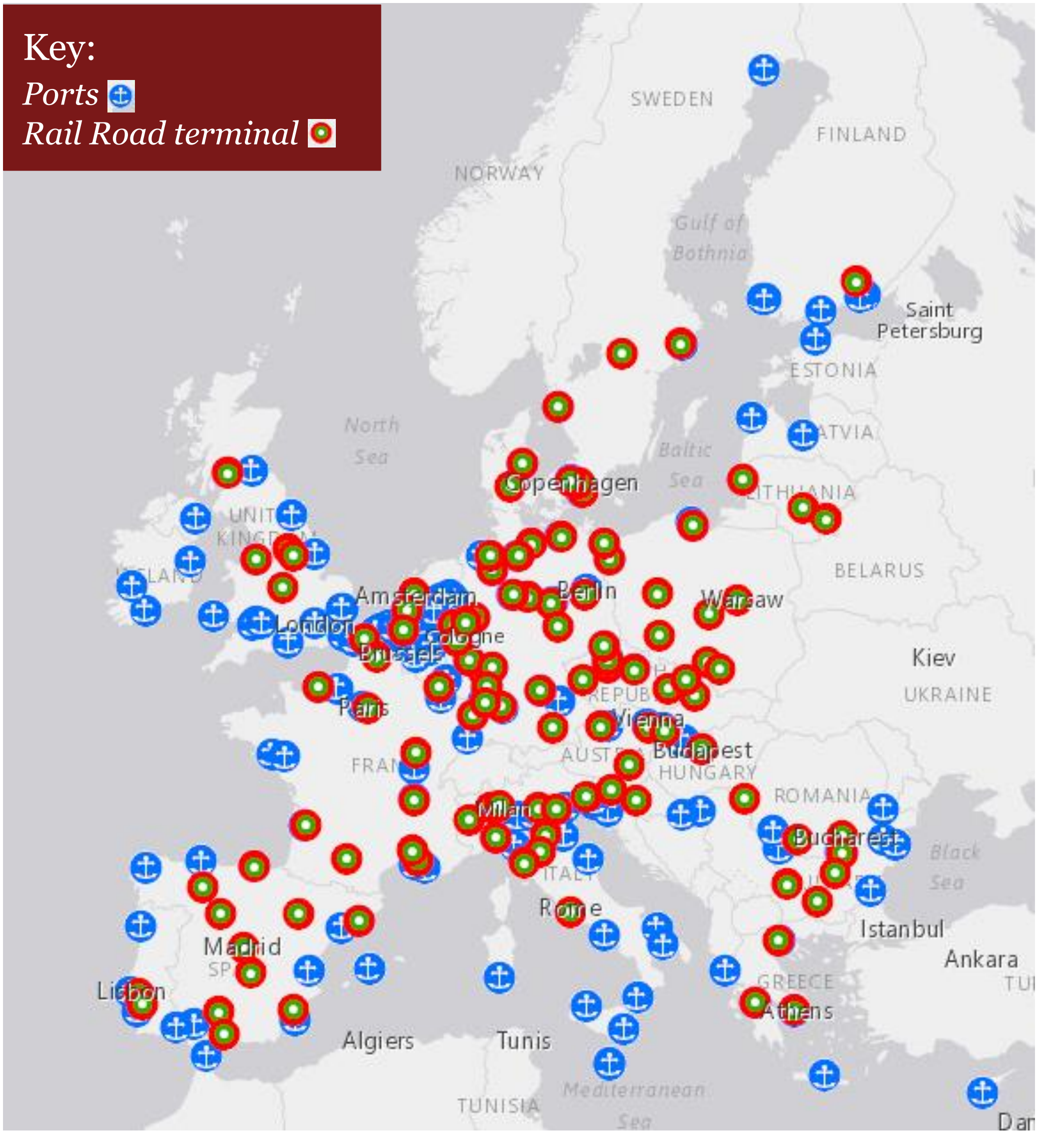
The Connecting Europe Facility (CEF) programme has been used - in combination with other financial sources originating in the Member States (at country, regional and local levels), as well as from private parties - for supporting and financing last-mile projects. However, **this programme is not a dedicated instrument**: as other relevant financing programmes in place, CEF programme focuses on "investment in infrastructure" and often the usage of the programmes for last-mile infrastructure - and consequently the impact on it - is difficult to measure.

However, in some cases, clear examples of last-mile infrastructure projects have been found, as reported in this section.

The following map shows the European Core Network of ports and railroad terminals:

[27] "Roadmap to a Single European Transport Area– Towards a competitive and resource efficient transport system", COM(2011) 144 final

Figure 18 - Core Network of ports and railroad terminals



3.2.1.1. Overview of 2014 CEF Transport calls

In light of the main aims of the CEF (completing the TEN-T Core Network and its Corridors by 2030), a total budget of € 24 billion has been made available for projects on the Trans-European Transport Network within the 2014 – 2020 timeframe. Out of this budget, € 11.3 billion is reserved for projects in the Member States that are eligible for support under the Cohesion Fund[28]; the funding allocated to projects is organised around three funding objectives:

- **Funding Objective 1 (FO1)**: removing bottlenecks and bridging missing links, enhancing rail interoperability, and, in particular, improving cross-border sections;
- **Funding Objective 2 (FO2)**: ensuring sustainable and efficient transport systems in the long run, with a view to preparing for expected future transport flows, as well as enabling all modes of transport to be decarbonised through transition to innovative low-carbon and energy-efficient transport technologies, while optimising safety;

[28] Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia

- **Funding Objective 3 (FO3)**: optimising the integration and interconnection of transport modes and enhancing the interoperability of transport services, while ensuring the accessibility of transport infrastructures.

To obtain CEF funding, it is essential demonstrate, firstly, how the proposal addresses the four blocks of award criteria:

- **Relevance**: it is not enough for a proposed action to be on a Corridor or TEN-T network to receive funding. It is necessary that the proposal meets the call objectives, addresses European transport policy objectives, makes a positive contribution to the TEN-T network and shows the added value to EU;
- **Maturity**: it relates to the status of the proposed action and its activities, including the technical specifications and time plan. CEF Transport is interested in actions that are “ready to roll”. Certificates or supporting documentation about necessary and legally obligatory approvals are essential;
- **Impact**: in this case, the benefits of the action is expected to bring have to be clearly identified and how it contributes to sustainable development;
- **Quality**: the quality criterion refers to a comprehensive description of the objectives and how they will be achieved, and it includes a sound project management process and plan.

Secondly, each proposal have to be reviewed on the basis of:

- EU added value (e.g. bridging missing links, enhancing rail interoperability, ensuring environmentally friendly transport mode, etc.);
- CEF objectives and priorities;
- Budgetary constraints;
- Compliance with EU environmental law;
- Programming under the European Structural and Investment Funds.

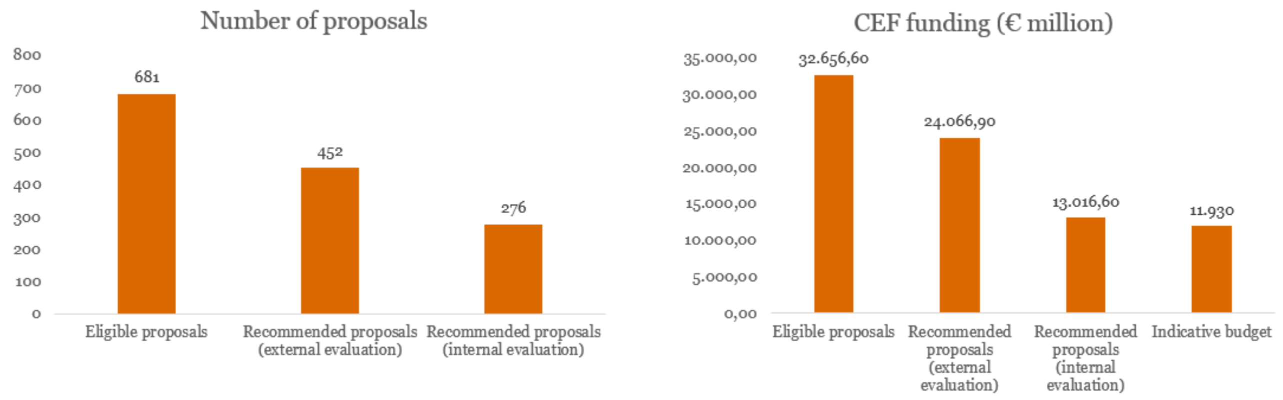
In the **2014 CEF Transport calls**, 735 proposals were received in response to the calls: 699 were deemed admissible (presented in due time and form); 681 were declared eligible (meeting all formal criteria requested in the call) and were subsequently evaluated by external experts.

Figure 19 - Eligible proposals under 2014 CEF Transport calls

Call	Number of eligible proposals	Requested CEF funding (€)	Available budget	Oversubscription factor
MAP – Funding Objective 1	231	17,351,208,542	6,000,000,000	2.9
MAP – Funding Objective 2	56	375,015,291	250,000,000	1.5
MAP – Funding Objective 3	134	1,438,774,030	750,000,000	1.9
MAP – Cohesion call	79	6,492,026,707	4,000,000,000	1.6
Annual call	181	6,999,601,822	930,000,000	7.5
TOTAL	**681**	**32,656,626,391**	**11,930,000,000**	**2.7**

At the end of the evaluation, **276 proposals, totalling more than € 13 billion in EU support**, were recommended for funding (more details are reported in Annex G). **Four hundred and five projects were not recommended for funding**.

Figure 20 - Proposals and funding by stages of evaluation



3.2.1.2. CEF project-based measure for last-mile support development

Any CEF-based measure for last-mile support program needs:

- To consider the European support programmes;
- To take the funding objectives of the EU Commission into account;
- To involve the stakeholders to analyse the needs and requirements for supporting the development of the last-mile infrastructure.

This approach permits access to programme funding more easily.

One of the most important findings emerged from the analysis of the 2014 CEF Transport calls is the **limited number of actions specifically focused on last-mile infrastructure**. The following table shows the main recommended and not recommended proposals by EU with a brief description of the actions, the eligible costs, and the share of EU support:

Table 19 - Recommended and not recommended last-mile 2014 CEF Transport proposals

Proposals	Title	Description	Total eligible costs (€)	Requested funding (€)	Recommended funding (€)	Recommended EU support
R	Timely inter-networks traffic management on Lyon metropolitan area	The proposed action is focused on the inter-connections between highway networks and metropolitan radial roads that constitute last-mile itineraries towards city centre. The action will provide a better-interconnected management of TEN-T network corridors and metropolitan networks and enhance networks management and end-user information	12.140.000	2.428.000	2.428.000	20%
	Mediterranean Corridor. Section Valencia – Tarragona – Barcelona. Implementation of UIC gauge	The proposed action will implement the UIC standard gauge along the 489 km Valencia – Tarragona – Barcelona track section of the Mediterranean Core Network Corridor. The action is part of a Global Project on removing a bottleneck and enhancing rail interoperability from Andalusia to the French border. The action will allow a direct passengers and freight connection to Europe linking ports, logistical centres, individual branches and stations.	311.227.977	124.491.191	124.491.191	40%
	Improving North Adriatic ports' maritime accessibility and hinterland connections to the Core Network	The proposed action aims to improve the maritime and land accessibility of the ports of Venice, Trieste and Koper, part of the Baltic – Adriatic Corridor. It also covers works to reconstruct, adapt and extend the existing quay walls devoted to container traffic, dredging activities and the construction of new railway tracks to support new container volumes in the Port of Koper.	150.499.996	28.471.999	21.959.999	20%
	Improvement of the hinterland rail connection and the maritime accessibility to the Port of Valencia	The action aims at improving maritime and hinterland interconnectivity. The activities concern the upgrading of rail infrastructure to UIC gauge and the accommodation of up to 750 metres long trains, as well as the upgrading of a quay to berth 18.000 – 20.000 TEUs containerships.	62.478.090	12.956.613	11.622.375	20,78%
	Intermodal logistics Platform Constanti	The aim of the action is to connect the Constanti Logistical Center with the Mediterranean Corridor in Spain. The freight Terminal facilities and current rail infrastructure will be modified in order to adapt and connect the rail node according to standard gauge.	7.000.000	1.400.000	1.400.000	20%
	Mediterranean Corridor: Algeciras - Madrid – Zaragoza	The action aims at preparing the upgrade of Madrid Vicalcaro Railway Freight Terminal (Spain). The action will contribute to	2.400.000	1.200.000	1.200.000	50%

Proposals	Title	Description	Total eligible costs (€)	Requested funding (€)	Recommended funding (€)	Recommended EU support
	– Barcelona section. Madrid – Vicalvaro freight railway terminal upgrade	adapt the terminal to accept 750 m long trains, enhance rail interoperability, remove a bottleneck and facilitate modal split.				
	Intermodal logistics platform in Southwestern Europe	The action consists of design and works to build a 132-hectare multimodal logistics platform, including the road and rail accesses to the Atlantic Corridor.	35.766.385	7.576.522	7.576.522	21,18%
	Port of Rijeka multimodal platform development and interconnection to Adriatic Gate container terminal	The proposed action aims at upgrading the railway connection between Rijeka and the Adriatic Gate Container Terminal. The action consists of the following activities: project management, construction of an intermodal terminal for loading/unloading of container, the reconstruction of railway station Rijeka – Brajdica and the construction of a new track in the pull-out tunnel	35.556.000	30.222.600	30.222.600	85%
	Rail2Bordeaux – Rail connections to the port of Bordeaux, maritime node of the Atlantic Corridor	The proposed action consists in the renewal of two existing railway lines, which in the past years have experienced problems of obsolescence and consequently loss of freight volumes.	40.546.000	9.818.840	9.818.840	24,22%
	Designing the Port of Lisbon's Multimodal Platform	The proposed action aims to prepare studies for development of the Port of Lisbon's Multimodal Platform. The action includes strategic studies for the multimodal integrated development of the port of Lisbon, studies of development and revamping of the Barreiro and Seixal port and multimodal logistics area and studies for the development of access infrastructure to the Atlantic Corridor and the last-mile connections.	6.562.955	3.281.478	3.281.478	50%
	NordicWay	The proposed action is a pre-deployment pilot of Cooperative ITS services in four countries (Finland, Sweden, Norway, and Denmark) in order to improve safety, efficiency, and comfort of mobility and connect road transport with other modes.	5.200.000	2.600.000	2.600.000	50%
NR	Upgrading of Baltic-Adriatic Corridor	The proposed action aimed to adapt the main freight railway lines and to overcome the bottlenecks in the last-mile connections.	130.000.000	34.600.000	0	0

Proposals	Title	Description	Total eligible costs (€)	Requested funding (€)	Recommended funding (€)	Recommended EU support
	Improving of the intermodal interconnections at Port of Freudenau/Vienna	The Global project aims at the expansion of the container transhipment capacities at the Port through land reclamation and optimisation of operational areas to increase storage capacity and handling performance.	9.020.200	1.804.040	0	0
	Port of Cartagena's railway access. Connection infrastructure with the national railway network	The proposed action concerns connecting the port railway with the national railway network.	18.512.426	3.702.485	0	0
	Development of a multimodal platform in the port of Dunkirk and its connection to the North Sea – Mediterranean Corridor	The action includes the expansion of the access channel and turning circle and the upgrade of the container berth on the maritime side; on landside, it will develop a new multimodal and logistics area.	25.980.000	5.196.000	0	0
	Design and pilot implementation of an integrated modular rail transport system for freight suitable for tanks	The proposed action aimed to study and pilot deploy of a new transport system of liquid (chemical) goods by train, and increased the competitiveness of rail transportation. The action would automate first and last-mile processes (with automated guided vehicles)	20.100.000	10.050.000	0	0
	Upgrading of existing multimodal terminal with rail access: investments in Ghent Container Terminal and Interface Terminal	The action concerns an expansion of the container terminal and the start-up of a rail terminal located at the Kluizendock.	19.263.000	3.852.000	0	0
	Section Barcelona – Perpignan standard gauge access to and upgrade of La Llagosta multimodal platform	The proposed action consists of drafting a construction project to connect La Llagosta Railway freight terminal to Corridor and upgrade it to enhance interoperability.	1.080.000	540.000	0	0
	Rijeka Port upgrading, development of multimodal platforms and connections –	The action aims to upgrade infrastructure and develop interconnections in the Core Port of Rijeka.	112.375.000	95.518.750	0	0

Proposals	Title	Description	Total eligible costs (€)	Requested funding (€)	Recommended funding (€)	Recommended EU support
	Zagreb pier container terminal					
	Road European Infrastructure Automation (REInA)	The proposed action aimed to study and pilot deploy in Barcelona (Spain) and Versailles-Satory (France) the advantages of key innovative technologies of road transport automation for last-mile transport services in terms of technical, economical, and legal aspects.	29.851.508	14.925.754	0	0
	Project for the improvement of public transport services to Merignac Airport from Bordeaux Centre	The proposed action aimed to cover the preparatory studies to bridge the last-mile link between Bordeaux and Merignac Airport through the 5 km extension of tram line A.	3.941.000	1.970.000	0	0
	Iberian Regions of the Atlantic and Mediterranean Corridors: urban-interurban interfaces for improving last-mile services	The proposed action aimed to study road-rail passenger accessibility of the Core Network Nodes within Iberian Peninsula.	1.000.000	500.000	0	0

R = recommended for funding;

NR = not recommended for funding

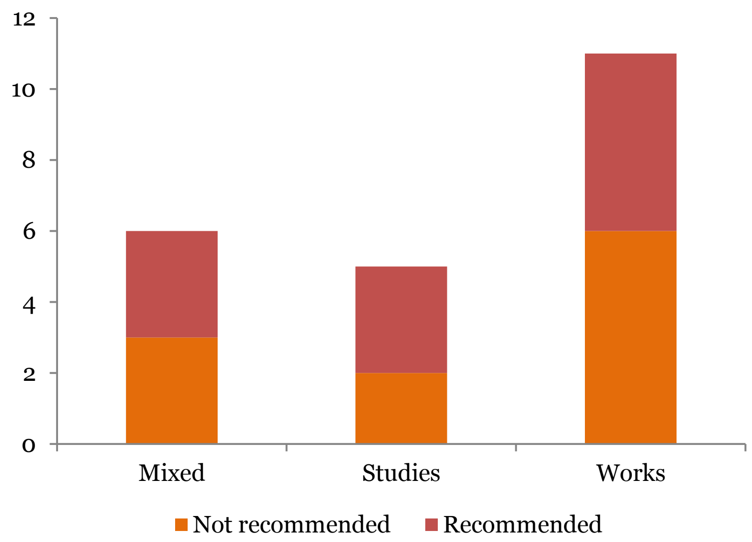
The outcomes of the analysis of the submitted proposals are presented below. The analysis was structured from two perspectives:

- Quantitative perspective – elaborates on the type of proposals submitted;
- Qualitative perspective – analyses the reasons why certain proposals were recommended/not recommended.

Quantitative evaluation

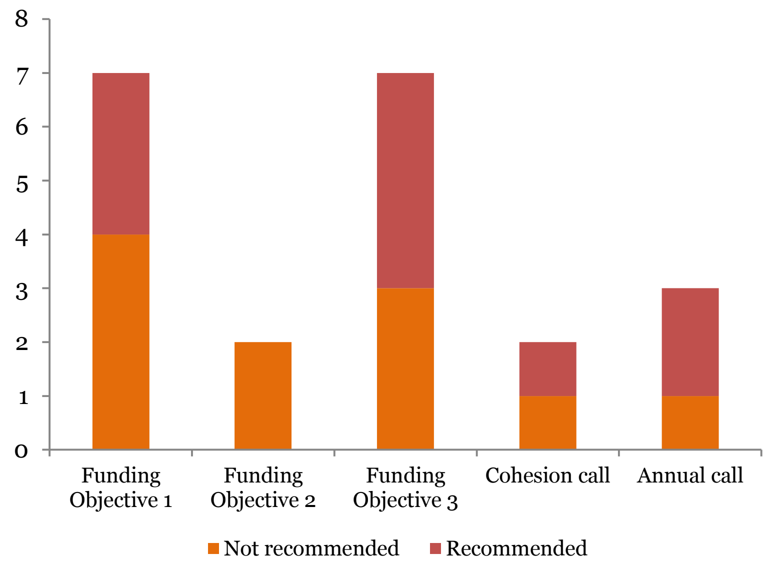
From the analysis of the data gathered above it can be seen that the majority of the submitted proposals for last-mile projects (11 proposals) addressed works. Meanwhile five proposals addressed studies and six were mixed projects (containing both works and studies).

Figure 21 - Number of proposals per types



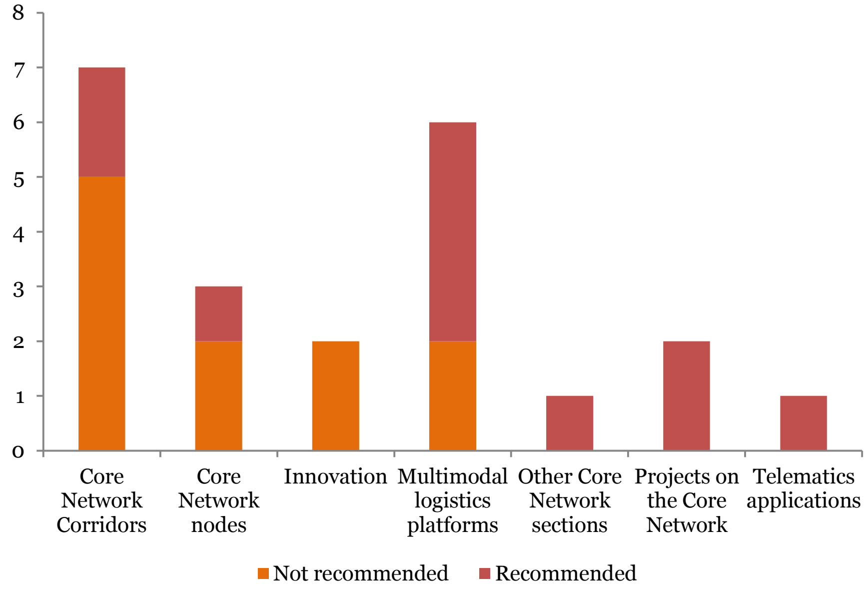
When looking into distribution of the proposals between work programmes it is observed that the majority of proposals were submitted for Funding Objective 3 (seven proposals) and Funding Objective 1 (seven proposals).

Figure 22 - Number of proposals per work programme



With regard to priority, the majority of proposals addressed core network corridors and multimodal logistics platforms. For each of the priorities "Other core network sections" and "Telematics applications" there was only one proposal submitted.

Figure 23 - Number of proposals per priority

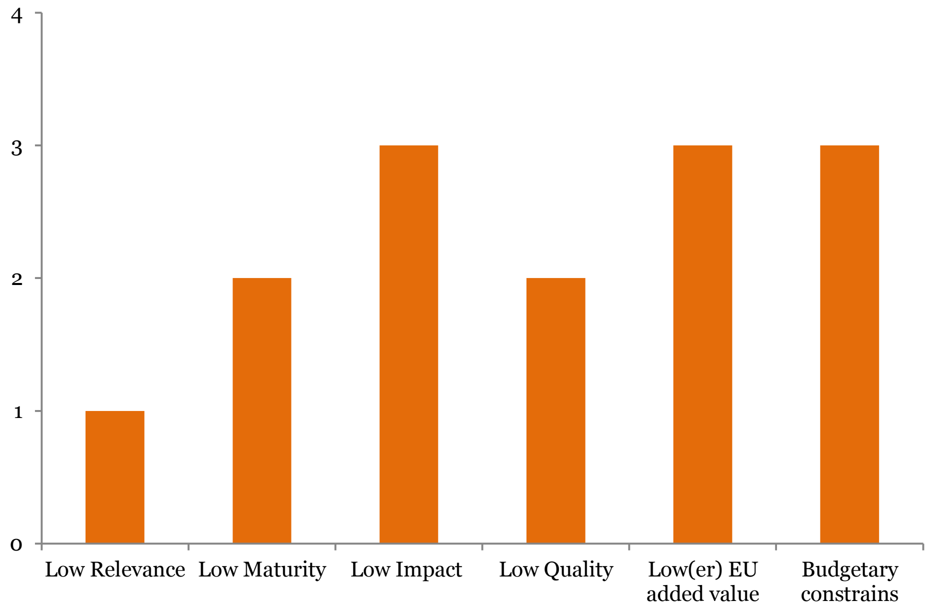


Qualitative evaluation

When analysing the proposals for last-mile projects, the values of award criteria "Relevance", "Maturity" and "Impact" vary from "excellent" to "good" while the values for "Quality" criteria vary from "good" to "very good".

The score of the not recommended proposals is low for one or more award criteria. The main reasons mentioned for not retaining the proposal are presented in the following figure:

Figure 24 - Reasons for proposals rejection



At the same time it shall be noted, that two proposals, though scoring high in general, were not recommended due to the budgetary constraint combined with the lower EU added value when comparing to the other projects. Furthermore, one project was cancelled only due to the budgetary constraint, though it scored very high according to all other award criteria.

This can be explained by the fact that **due to the budgetary constraint the evaluation committee decided to focus the available funding first on the major cross-border projects and then on projects addressing the main bottlenecks of the 9 TEN-T multimodal Core Network Corridors**, as well as on horizontal priorities such as ERTMS. Therefore, as the last-mile projects do not address cross-border issues, they are not the top priority for funding.

According to the analysis of the data gathered above, the **main rationales/reasons** of each proposal recommended/ not recommended for funding, have been highlighted, specifically:

Table 20 - Matrix of rationales/reasons of each proposal for funding

Proposals	Main rationales/reasons
Recommended funding	• The proposed actions are very relevant in terms of European transport policy objectives; • The proposed actions are already started, therefore their maturity is good; • The proposed actions have a great impact because they bring EU added value; • The quality of the proposed actions is good as the objectives are clear and the activities are analytically presented
Not recommended funding	• The proposed actions have not been retained for funding due to budgetary constraints; • The proposed actions have not been retained for funding due to the lower EU added value; • The proposed actions have not been retained for funding due to the limited/poor relevance and not addressed the Call priorities.

Such findings (limited number of applications, of which few are accepted) shall be explained by the following remarks, in an overall context of budget constraints:

- Although infrastructure financing provides the most direct link to last-mile infrastructure, it might not appear as playing strategic role in bringing last-mile infrastructure (there is relatively recent integration of such type of infrastructure as key part of the TEN-T development and as a matter of fact, TEN-T development was actually focused on main line and nodes);
- The relevance of such projects in terms of EU added value seems to be not fully perceived: while it is recognized that last-mile infrastructure is a critical issue for the intermodal part on the TEN-T Network, the specific added value of this kind of projects is likely to be perceived lower than for other infrastructure projects (e.g. the ones related to bottlenecks removal on the main network).

Also considering these outcomes, **more focus on the last-mile infrastructure should be guaranteed**. Specifically, a **CEF project-based measure to support last-mile infrastructure** should be clearly defined and included into the **Funding Objective 3 and Cohesion call in order to:**

- Enhance the interoperability of the transport system;
- Increase the modal shift from road to rail;
- Ensure the accessibility of transport infrastructure.

This dedicated support programme may be managed under the CEF funding (also in specific Calls of Proposals) and should involve all the beneficiaries operating within logistic nodes, freight villages, ports and railroad terminals.

In particular, the support programmes for ports and railroad terminals should be:

- Developed at EU/country level;
- Approved at Member States level;

- Focused mainly on ports with limited links to the inland (e.g. port of Koper is committed to improving own railway connections to hinterland markets in order to increase intermodal traffic and the operational efficiency);
- Developed in order to homogenize the transmission of data between railroad terminals and main railway network.

3.2.2. Overview of other relevant programmes/instruments

Desk research resulted in a comprehensive list of programmes and instruments that are or could be relevant in terms of financing capability for last-mile infrastructure. Based on the information collected, we have classified the programmes **into three categories** based on their relevance to financing last-mile infrastructure, specifically: "Low Relevance" (LR); "Relevant" (R); "High Relevance" (HR). The full list of programmes labelled according to the three categories mentioned above is provided in Table 21 for EU initiatives and Table 22 for Member States initiatives. This represents a preliminary assessment and it is based on the analysis of the public information available for each programme/instrument. This entailed a top-down approach and, whenever possible a bottom-up examination of the data available along pertinent drivers, such as the scope and coverage of the programme, the types of investments covered and eligible actions.

We ranked as "**Highly Relevant" (HR)** those programmes concerning specifically the transport sector and zooming on transport infrastructure, including rail infrastructure, as these were judged on the basis of the information available to cover last-mile infrastructure.[29]

We ranked as "**Relevant" (R)** those programmes and instruments covering the transport sector and focusing on issues not necessarily related to last-mile (e.g. transport services; innovation), as well as instruments of a broader scope.[30] What all these instruments have is common is that they could nevertheless cover last-mile infrastructure.

We used the label **"Low Relevance" (LR)** for programmes and instruments which, in view of their specific features and/or focus on other domains than transport or transport infrastructure, have the potential to cover last-mile only marginally and exceptionally[31] .

3.2.2.1. Programmes and instruments at European Union level

This sub-section provides an overview of the EU level programmes and instruments that have been or could be used for financing last-mile infrastructures, highlighting key characteristics, such as implementation period, total funding volume, and the possibility to combine different funding instruments.

General

Through desk research, **ten (10) programmes and instruments** that have been or could be used for financing last-mile projects have been identified and examined. An overview of these programmes and instruments is presented in Table 21. Among these instruments, the Shift2Rail Joint Undertaking,[32] the Connecting Europe Facility (CEF), the European Regional Development Fund (ERDF), the Cohesion Fund (CF) and Marco Polo II are highly relevant for last-mile infrastructure. Other programmes, such as the EBRD and EIB instruments, as well as the Marguerite Fund have been considered as being relevant also for the last-mile infrastructure in view of their vocation to be used for financing transport infrastructure.

Implementation Period

[29] E.g. Shift2Rail, Marco Polo, TEN-T (at EU level); Innovation program for combined freight transport (Austria); Funding for combined transportation terminals for non-federal undertakings (Germany); Infrastructuurfonds (Netherlands); Operational Program "Transport" (Croatia, Slovakia, Romania, etc.).
[30] E.g. Marguerite Fund; European Investment Bank instruments (at EU level); Nordic Investment Bank instruments in the some Member States.
[31] E.g. European Social Fund (at EU level); Future of Mobility (Austria); Garantie Ondernemingsfinanciering (Netherlands); Local sustainable transport fund (UK).
[32] Both the objectives and the eligible actions of Shift2Rail according to Regulation 642/2014indicate a potential to cover research and innovation projects entailing last-mile infrastructure. Shift2Rail has a dedicated innovation programmes (IPs), of which IP5 is aimed at Technologies for Sustainable & Attractive European Rail Freight. This IP deals amongst other with last-mile infrastructure. According to Shift2Rail, enabling technology is needed to realise economies of scale on the long-distance legs of a wagonload system – e.g. through train-coupling and -sharing – which must be combined with new ways to carry out last-mile operations. Although Shift2Rail is research oriented, it is expected to eventually contribute to last-mile infrastructure by linking research to innovation and providing seamless and coherent funding from idea to market.

Some of the EU instruments identified run for the **period 2014-2020** (Shift2Rail, CER, ERDF and CF). Whereas, Shift2Rail and CEF are new initiatives, TEN-T, ERDF and Cohesion Fund were active the previous programming period. For the programmes active in the past and which are still operational, we have focused on the current description of the programmes. We have included programmes from the previous programming period (i.e. 2007-2013) to collect examples of how these instruments have been used in practice. **The Marco Polo II programme** was running until 2013, but it is considered relevant for our study for several reasons. Firstly, because of its relevance for financing last-mile infrastructure. Secondly, because this programme is still topical as there are still projects being implemented under this instrument. This enabled us not only to find exemplary projects covering last-mile infrastructures financed through this instrument, but also to bring forward recommendations for EU financing of last mile in the future. For some instruments, more specifically **Marguerite Fund, EBRD and EIB instruments**, the implementation period is not precisely determined.

Total Funding Volume

The total funding volume of the EU programmes considered is established in most cases **for a seven-year** programming period (i.e. Shift2Rail, TEN-T, ERDF, Cohesion Fund, Marco Polo), whereas in the other cases the funding provided is **not clearly linked to a determined programming period** (Marguerite Fund, and EIB instruments). Regarding the EBRD, the total funding volume invested in the transport sector is provided roughly for a period of 20 years (between 1992 and 2012) at 10 billion EURO. The funding volume available under the financial instruments considered ranges from up to 1 billion EURO (Shift2Rail, Marco Polo II, Marguerite Fund, European Investment Bank LGTT), to amounts up to 10 billion EURO (European Investment Bank SFF; EBRD Instruments – Loans, Equity Instruments and Guarantees) and finally, to amounts over 10 billion euro (TEN-T, ERDF, Cohesion Fund). In the case of the ERDF and the Cohesion Fund, the total amounts allotted to the transport sector out of the total funding volume are specified. Obviously, these amounts address a much broader scope than last-mile infrastructure.

Use and combination of the various instruments

EU programmes and instruments examined often do not finance entirely a project. These programmes and instruments are often used **in combination with other financial sources** originating in the Member States (at national, regional and local levels), as well as from private parties. In the Central and Eastern European countries, for instance, ERDF and the Cohesion Fund represent the main funding source for the transport and regional Operational Programmes, which are used for financing transport infrastructure projects, including last-mile infrastructure. On the other hand, the Marco Polo II programme has been used to finance directly projects involving last-mile infrastructure. Various EU financial instruments can be applied in combination for investing in transport infrastructure projects (including last-mile infrastructure). For instance, EIB financial instruments are used in order to complement wider EU funding for specific projects.

Table 21 – Other support-programmes/instruments at EU level

No.	Programme Name	Implementation Period	Total Funding Volume (€)
1	Shift2Rail (HR)	2014-2020	920 million
2	Connection Europe Facility - CEF[33] (HR)	2014-2020	26.2 billion
3	TEN-T Programme (HR)	2007-2013	8.1 billion
4	European Regional Development Fund (HR)	2014-2020	25.6 billion (for transport)
5	Cohesion Fund (HR)	2014-2020	63.4 billion (10 billion for transport infrastructure projects)
6	Marguerite Fund (R)	Indefinite period	710 million
7	Marco Polo II (HR)	2007-2013	450 million

[33] Connection Europe Facility is the successor of the TEN-T Programme 2007-2013 (some sort of a new TEN-T for 2014-2020) - http://inea.ec.europa.eu/en/cef/cef_transport/apply_for_funding/cef_transport_call_for_proposals_2014.htm

No.	Programme Name	Implementation Period	Total Funding Volume (€)
8	EBRD Instruments – Loan, Equity Instruments and Guarantees (R)	Indefinite period	10 billion (for transport 1992-2012)
9.1	European Investment Bank LGTT (R)	Indefinite period	1 billion
9.2	European Investment Bank SFF (R)	Indefinite period	3.75 billion

3.2.2.2. Programmes and instruments at Member State level

This sub-section provides an overview of the non-dedicated programmes and instruments identified in the Member States, which are being, have been or could be used for financing last-mile infrastructure.

General

In most Member States one or more programmes or instruments have been identified which could be used for financing last-mile infrastructure, as listed in Table 22. A total of **62 funding schemes and instruments have been found in 23 Member States**. In the case of Luxembourg, Belgium and Portugal, desk research did not result in identifying relevant information regarding funding schemes and instruments relevant for last-mile infrastructure. Just like in the case of the EU financial instruments, the programmes identified in the Member States have been classified according to their relevance for last-mile infrastructure. Thus, **out of the 62 programmes 20 have been considered** as having **Low Relevance (LR)**, **26 being Relevant (R)**, and **16 as having High Relevance (HR)** for last-mile infrastructure (see Table 22). This classification is based on the opportunity of using these programmes for financing last-mile infrastructure.

Some Member States have put in place several programmes and funding schemes which may be used for investing in last-mile infrastructure. **A good example is Germany** where a funding scheme named “Funding for Combined Transportation Terminals for Non-Federal Undertakings” was set up in 1998. This is not directly intended for railway sidings, but for combined transportation terminals where there will be railway sidings. Germany also has other programmes that are more general in nature and intended for transport infrastructure, such as the United Germany Transportation Project and the Infrastructure Acceleration Programme II[34].

In other Member States, available options often combine state with EU funding. This is notably the case in Central and Eastern European countries. Bulgaria, Croatia, Czech Republic, Greece, Hungary, Italy, Lithuania, Poland, Romania, Slovakia, and Slovenia benefit from Operational Programmes, supported by ERDF and Cohesion Funds, in which the majority of funding comes from the EU. This is reflected in the Operational Programmes in the above-mentioned Member States.

For instance**, Slovenia has two Operational Programmes**, financed mostly through ERDF and Cohesion Funds, with additional state funding. The first Operational Programme “Development of Environment and Transport Infrastructure” is directly targeted on transport and development and is considered relevant for last-mile infrastructure. It should be noted that in general the Operational Programmes for Transport have a broader scope, with emphasis on development of main infrastructure connections. However, last-mile infrastructure is not excluded. The Lovochemie siding in the Czech Republic is an example where last-mile infrastructure is funded through ERDF.

Implementation Period

In our desk research, we focused on Member State level programmes running **from 2007 onwards**. The reason is that these programmes have been operational for a certain period, which permits to obtain useful

[34] The United Germany Transportation Project through a total of 17 transport projects (VDE) built the backbone of efficient transport links between the “new” and “old” German federal states. The programme consists of nine rail, seven highway projects and a waterway project. The programme with a total volume of 39.4 billion € was launched in 1991 to accelerate the convergence of East and West German federal states. The implemented projects have been large scale projects and in practice have had limited relevance for last-mile-infrastructure (funding). This also applies to the Infrastructure Acceleration Programme II.

insights with regard to their relevance for last-mile infrastructure. Moreover, it is assumed that by looking at such instruments it is possible to identify concrete examples and potential best practices. The most important programmes are those **that are still available today** because this means that there is a **concrete possibility for future applicants to use these funding schemes** in order to finance their last mile infrastructure related projects. However, also programmes and funding schemes that have been used recently are relevant for this study, in particular for identifying best practices that have been used in the past (and could be considered for the future).

A total of 19 funding schemes has already expired after 2010 and before 2015.[35] The rest are still available up to date. Some of these programmes are indefinite in the sense that their ending period is not specified. Most of them mention that they are available for an indefinite period, but there is a problem for example in the case of the loan programme from Nordic Investment Bank where there is no information on their term, but what is known is that it is still opened for applications. The most common period of the funding programmes is from 2007-2013 and from 2014-2020 (in particular for the Operational Programmes available in the Member States).

Total Funding Volume

As regards the total funding volume of individual funding schemes in different Member States, it is hard to advance a general conclusion. However, it is important to note that the total funding volume expressed in Table 22 concerns the total funding volume available for the programme or instrument in general (not only last-mile infrastructure *per se*).

Concerning the programmes put in place by the Member States within the framework of the EU instruments, as well as some of the instruments developed at national level, the total funding volume **is expressed for the whole implementation period** and usually comprises billions of EURO. For example, in France the Programme d'investissements d'avenir has a budget of 47 billion EURO, covering the period 2010-2014[36]. On the other hand, the purely national funding schemes available in some Member States are established **on a yearly basis** and, therefore, comprise smaller amounts of funding volume. Therefore, it is hard to evaluate the differences between the individual Member States. Even though some countries may have only one or two instruments and rely mostly on support from the European Union (Eastern and Central European countries), the total funding volume can be comparable to that available in Member States with mostly national funding divided in smaller funds (e.g. United Kingdom, Germany). In some instances, **there is no information on the total funding volume** provided such as the "Beihilfe des Bundes für die Erbringung von Schienengüterverkehrsleistungen in bestimmten Produktionsformen in Österreich" (Federal Aid for the Provision of Rail Freight Services). Nonetheless, we consider it as a relevant instrument as it addresses last-mile infrastructure.

Use of and combination of various instruments

The research conducted on 26 EU Member States reveals that **13 States[37] do not have any national programmes or instruments**, but mostly make use of **funding from EU level** with only a **limited contribution from the national budget** (e.g. Slovenia, Romania, Greece, Hungary) or **foreign investment banks** (Sweden, Estonia, Finland). Only in **ten countries[38] national funding schemes can be found**, Germany, Austria and the Netherlands being frontrunners as regards the number of national funding instruments implemented. An example of a country, which effectively combines the national instruments with programmes supplemented from EU, is Poland. Started with the Polish Investment Programme in 2012, a significant amount of financing was contributed through national channels (national investment bank), also making use of EU resources by implementing different Operational Programmes.

[35] Innovationsförderprogramm Kombinierter Güterverkehr (Austria), IV2SPlus Transnational (Austria), IV2SPlus National (Austria), Operational programme "Transport" (Bulgaria). Operational Programme "Transport" (Croatia), Operational Programme "Transport"(Czech Republic), Inter-ministerial Land Transport Research and Innovation Programme (France), Programme d'investissements d'avenir (France), Operational Programme "Improvement of Accessibility" (Greece), Transport Operational Programme (Hungary), Economic Development Operational Programme (Hungary). Adriatic IPA (Italy), Operational programme "Network and Mobility"(Italy), Operational Programme "Zachodniopomorskie" (Poland), Operational Programme "Infrastructure and Environment" (Poland), Operational Programme "Transport" (Romania), Regional Operational Programme (Romania), Operational Programme "Transport" (Slovakia), Operational Programme "Development of Environment and Transport Infrastructure" (Slovenia)

[36] In France there are other funds available for R&D in transport, such as ANR (Agence Nationale pour la Recherche), FUI (Fond Unique Interministeriel) , ADEME (projects related to energy savings) and PREDIT.

[37] Slovenia, Romania, Greece, Hungary, Sweden, Estonia, Finland, Bulgaria, Croatia, Czech Republic, Latvia, Lithuania, and Slovakia.

[38] Germany, Austria, Netherlands, France, Denmark, Ireland, Italy, Poland, Spain, and United Kingdom

Table 22 – Other support-programmes/instruments at Member State level (LR=Low Relevance; R=Relevant; HR=High Relevance)

No.	Countries	Programme Name	Implementation Period	Total Funding Volume (€)
1	Austria (R)	Beihilfe des Bundes für die Erbringung von Schienengüterverkehrsleistungen in bestimmten Produktionsformen in Österreich (Federal Aid for the Provision of Rail Freight Services)	2012-2017	No information
2	Austria (HR)	Innovationsförderprogramm Kombinierter Güterverkehr (Innovation Programme for Combined Freight Transport)	2009-2014	Approx. 3 million per year
3	Austria (LR)	Intelligent Transport Systems and Services plus (IV2Splus) - Transnational	2007-2012	1 million per year
4	Austria (LR)	Intelligent Transport Systems and Services Plus (IV2Splus) – National	2007-2012	17 million per year
5	Austria (LR)	Mobilitat der Zukunft (Future of Mobility)	2012-2020	13-19 million per year
6	Bulgaria (R)	Operational Programme “Transport”	2007-2013	2 billion
7	Bulgaria (R)	Operational Programme “Transport and Transport Infrastructure”	2014-2020	1.89 billion
8	Bulgaria (R)	Nordic Investment Bank Long Term Loan	No information	1,922 million
9	Croatia (R)	Operational Programme Competitiveness and Cohesion (OPCC)	2014-2020	1.3 billion
10	Croatia (R)	Operational Programme Transport	2007-2013	278 million
11	Czech Republic (R)	Státní Fond Dopravní Infrastruktury/ The State Fund for Transport Infrastructure	From 2000 for indefinite period	Approx. 3.4 billion
12	Czech Republic (HR)	Operational Programme “Transport”	2007-2013	6.8 billion
13	Denmark (LR)	Green Investment Plan	2011-2020	Approx. 20 billion
14	Denmark (R)	Nordic Investment Bank Long Term Loan	No information	1,992 million (per 2013)
15	Estonia (R)	Nordic Investment Bank Long Term Loan	No information	1,992 million (per 2013)
16	Finland (LR)	Nothern Dimension Partnership on Transport and Logistic Support Fund	Indefinite period	No information
17	Finland (R)	Nordic Investment Bank Long Term Loan	No information	1.,92 million (per 2013)
18	France (LR)	Inter-ministerial Land Transport Research and Innovation Programme (Predit 4)	2008-2013	400 million
19	France (R)	Programme d’investissements d’avenir (PIA 1 and PIA 2)	2010-2014	47 billion

No.	Countries	Programme Name	Implementation Period	Total Funding Volume (€)
20	Germany (R)	Infrastrukturbeschleunigungsprogramm II (Infrastructure Acceleration Programme II)	From 2012 for indefinite period	1,750 million
21	Germany (HR)	Förderung von Umschlaganlagen des Kombinierten Verkehrs nichtbundeseigener Unternehmen (Funding for Combined Transportation Terminals for Non-Federal Undertakings)	From 1998 for indefinite period	92 million (per 2015)
22	Germany (R)	Verkehrsprojecte Deutsche Einheit (United Germany Transportation Project)	From 2012 for indefinite period	39.7 billion
23	Greece (R)	Operational Programme 'Improvement of Accessibility'	2007-2013	4,976 million
24	Greece (LR)	Operational Programme Transport 'Infrastructure, Environment, and Sustainable Development'	2014-2020	5.2 billion
25	Hungary (HR)	Transport Operational Programme	2007-2013	7.3 billion
26	Hungary (R)	Economic Development Operational Program	2007-2013	2.93 billion
27	Ireland (LR)	Irish Infrastructure Fund	From 2013 for indefinite period	1 billion
28	Italy (R)	Adriatic IPA	2007-2013	298 million
29	Italy (HR)	Operational Programme "Network and Mobility"	2007-2013	1.8 billion
30	Latvia (LR)	Nothern Dimension Partnership on Transport and Logistic Support Fund	Indefinite period	No information
31	Latvia (R)	Nordic Investment Bank Long Term Loan	No information	1,992 million (per 2013)
32	Lithuania (HR)	Operational Programme for EU Structural Funds Investments for 2014-2020	2014-2020	7.9 billion
33	Lithuania (R)	The Northern Dimension Partnership on Transportation and Logistics	2009-indefinite period	1.4 million (per 2015)
34	Lithuania (R)	Nordic Investment Bank	No information	1,922 million (per 2013)
35	Netherlands (LR)	Borgstelling MKB	Indefinite period	No information
36	Netherlands (LR)	Garantie Ondernemingsfinanciering	Indefinite period	More than 1.2 billion issued guarantees by the government since 2009
37	Netherlands (HR)	Hoogfrequent Spoorvervoer	2010-2020	4.4 billion
38	Netherlands (HR)	Infrastructuurfonds	2014-2028	36.9 billion

No.	Countries	Programme Name	Implementation Period	Total Funding Volume (€)
39	Netherlands (LR)	Innovatiefonds MKB+	2012-2015	500 million
40	Netherlands (HR)	BDU 'Brede Doeluitkering Verkeer en Vervoer'	Indefinite period	1.6 billion per year
41	Poland (R)	Nothern Dimension Partnership on Transport and Logistic	From 2009 for indefinite period	1.4 million (per 2015)
42	Poland (R)	Nordic Investment Bank	No information	1,992 million (per 2013)
43	Poland (LR)	Operational Programme 'Zachodniopomorskie'	2007-2013	982.8 million
44	Poland (LR)	Operational Programme 'Development of Eastern Poland'	2014-2020	2.35 billion
45	Poland (HR)	Operational Programme 'Infrastructure and Environment'	2007-2013	37.56 billion
46	Poland (HR)	Operational Programme 'Infrastructure and Environment'	2014-2020	32.27 billion
47	Poland (HR)	Inwestycje Polskie (Polish Investment Programme)	From 2012 for indefinite period	Approx. 196.93 billion
48	Romania (HR)	Operational Programme Transport	2007-2013	5.69 billion
49	Romania (R)	Regional Operational Programme	2007-2013	4.38 billion
50	Slovakia (R)	Nordic Investment Bank	No information	1,992 million (per 2013)
51	Slovakia (HR)	Operational Programme "Integrated Infrastructure"	2014-2020	4.66 billion
52	Slovakia (LR)	Operational Programme "Transport"	2007-2013	3.08 billion
53	Slovenia (HR)	Operational Programme "Development of Environment and Transport Infrastructure"	2007-2013	1.92 billion
54	Slovenia (LR)	Operational Programme for the Implementation of the EU Cohesion Policy	2014-2020	3.76 billion
55	Spain (LR)	Financiación del Convenio con el Cabildo Insular de Gran Canaria en materia de ferrocarril (Financing Agreement with the Grand Canary Island Council, on Rail Infrastructure)	Indefinite period	1.46 million
56	Spain (R)	2013 Estrategia Logistica de Espana (Spain Logistic Strategy 2013)	From 2013 for indefinite period	7,650 million
57	Sweden (LR)	Nothern Dimension Partnership on Transport and Logistic Support Fund	Indefinite period	No information
58	Sweden (R)	Nordic Investment Bank Long Term Loan	No information	1,992 million (per 2013)

No.	Countries	Programme Name	Implementation Period	Total Funding Volume (€)
59	United Kingdom (LR)	Growing Places Fund	From 2011 for indefinite period	Approx. 620 million (per 2011)
60	United Kingdom (LR)	Local Sustainable Transport Fund	From 2011 for indefinite period	Approx. 138 million (per 2015)
61	United Kingdom (R)	Modal Shift Revenue Support	2009-2015	No information
62	Scotland and Wales	Freight Facilities Grant	From 2001 for an indefinite period	7 million per year

3.2.3. Main features and comparative analysis

3.2.3.1. Main features

The analysis of the EU and Member State level programmes has been carried out along the following key features: types of investments covered; types of eligible costs; form of financing; share of eligible costs; share of EU funding; usage of the programme; eligible beneficiaries; eligibility criteria and funding that can be allocated to last-mile infrastructure (see Annex E). These main features are defined below and are used to structure the comparative analysis as presented in the two follow-up sections.

The **types of investments** pertain to the overall theme of the projects that is covered by the respective funding programme. Unlike Section 3.1 of this report, in this section, a broader perspective is taken due to the focus on schemes that do not concern explicitly last mile infrastructures.

Unlike the types of investments, which are more thematic and general in scope, the **types of eligible costs** are related to the specific activities that are covered under the relevant instruments. Some funding instruments are more permissive in allowing more types of costs to be covered than others, but in general, costs under this key aspect include project planning, construction, land acquisition, consultancy, feasibility studies, technical assistance, taxes, etc. Overall, scarce information has been obtained as regards the eligible costs under different financial instruments identified in the Member States.

The **form of financing** indicates how the funding is provided to the beneficiary under the relevant instrument. Most commonly, the funding is provided in the form of a grant, where the financing body simply gives the beneficiary an amount of money depending on the share of eligible costs. Yet some programmes and instruments feature other forms of support, consisting of loans, guarantees and equity investments.

The **share of eligible costs** is the portion out of the total project costs that is eligible to receive funding from the programme, whereas the **share of EU funding** is the share out of the eligible costs that comes from the EU. The share of eligible costs may vary largely across the Member States and at EU level, depending on the features of the particular programmes, types of eligible actions and other criteria.

The **usage of the programme** entails essentially looking at the number of applications that have been made for the programme, how many were accepted, and the total amount of money or capital approved by the financing body. The information collected through desk research on these aspects is scarce. Only in few cases was it was possible to obtain more precise data on this key driver with regard to EU and Member State level instruments.

The **funding that can be allocated to last-mile infrastructure** is the least covered key driver in our study. The information concerning this key driver was very difficult to obtain both at EU and Member State level.

The **eligible beneficiaries** cover the private and/or public entities that may receive support under the different EU and Member State level programmes. They vary depending on the purpose and design of the each particular instrument. Whereas overall the desk research covered beneficiaries in a satisfactory manner, in few Member States little or no information could be obtained with regard to this key feature.

The information on **eligibility criteria** is missing in many cases due to the (slight) overlap with the conditions for funding. The various eligibility criteria are linked to the type of the action, the objectives to be attained, the size of the projects, the co-financing of the project, etc. Sometimes more specific requirements are imposed. Regarding the **conditions for funding**, the focus is on more specific aspects, concerning usually the attainment of certain ex post requirements or targets.

Beside the more direct financial incentives provided under the instruments/programmes identified at EU and Member State level**, there are also other incentives that are available for supporting last-mile investments, such as** concessions and tax incentives. The example of the **Rotterdam World Gateway Terminal** (see the box below) provides a good illustration on how other incentives, besides financing through various EU and Member States level programmes, can be used for supporting investment in last-mile infrastructure.

Rotterdam World Gateway Terminal

The purpose of this project is to develop the Maasvlakte 2, the newest port location of the Rotterdam Harbour. The beneficiaries are the Port of Rotterdam Authority and the RWG Consortium. The project includes a rail terminal and a track connection to Betuweroute. The terminal is operated by the RWG consortium. The container terminal has committed to transport maximum 35% for containers by road, whereas the remaining 65% must be transported by rail or water. This requires a doubling of the current 10% share of the railway. In the case of the RWG container terminal, this also entailed building a dock rail terminal with 6 rails. This project started in 2007 and will end in 2016. The total project costs are approx. € 700 million, mostly supported through private funding. Alongside this investment, there is also a concession granted by the Port of Rotterdam to the terminal operator to build the terminal. This project is an excellent example of how a concessions regime in combination with imposing on the operator the commitment to limit the transport by road in favour of other means of transport can be used to attract investment in last mile infrastructures.

In the case of the Rotterdam World Gateway Terminal, the concessions regime was applied by the Port of Rotterdam to convince the concessionaires to build rail terminals can be advanced as a best practice for stimulating investment in last-mile infrastructure. This example also shows that a **combination of concessions with other non-financial incentives** (such as the requirement to increase the share of transport by rail) **can be very effective** as it demonstrates added value to the use of last-mile rail infrastructure.

Other indirect incentives, such as the availability at national and local levels of various tax benefits to stimulate investment in various projects **might also be relevant** for last-mile infrastructure. In addition, state aid provided under certain conditions to undertakings investing in projects involving last-mile infrastructure can be considered within this category, as illustrated by the Mercedes-Benz manufacturing facility example in Hungary (see chapter 5.2.1).

3.2.3.2. Comparative analysis at EU level

This section contains a comparative analysis of the non-dedicated support -programmes and instruments at EU level. Key drivers, as outlined below, are reviewed for the ten identified programmes and instruments. A comparative matrix is included in Annex F.

Types of investments covered & types of eligible costs

When comparing the **types of investments covered** by the EU financial instruments relevant for last-mile, it is noted that most of them cover explicitly transport infrastructure (TEN-T; Cohesion Fund; ERDF; Marco Polo; Marguerite Fund, EBRD, EIB instruments). Within this category, variations occur as some programmes may cover also other types of investment, such as infrastructure in environment or energy, whereas other programmes are focused on transport infrastructure, or sometimes on specific types of transport infrastructure.

More details regarding the types of investments are provided by the instruments dedicated to transport infrastructure, such as TEN-T, as compared to the more concise information provided by instruments of a broader scope. On the other hand, few EU instruments refer to transport services (Marco Polo II) or research and innovation of transport infrastructure (Shif2Rail), suggesting that last-mile infrastructure could also be covered in an ancillary manner.

The information concerning the **eligible project-related costs** was inconclusive for most of the EU instruments. Whereas for some instruments (Marguerite Fund, EBRD instruments and the SFF ran by EIB) no data was available through open sources with regard to specific eligible costs, in other instances the instrument refers to eligible costs in general terms such as "operational expenditure", "public and private expenditure", "research and innovation" or "senior debt". Unlike the previous cases, for the TEN-T programme it was possible to distinguish between different types of eligible costs concerning projects covered under the instrument. This suggests that **various types of project costs may be eligible under the different EU instruments** and programmes considered.

In this context, most of the instruments **cover costs related to the direct implementation of the infrastructure project**, whereas others appear to **focus on a certain project stages** (e.g. research, planning) or on **more indirect financial incentives** (e.g. LGTT instrument provided by EIB). This suggests that various types of project costs may be eligible under the different EU instruments and programmes considered. However, beyond these general comparative observations, the limited information obtained does not allow performing a full-fledged comparative analysis for this key driver.

The Freight Terminal Wolfurt project in Austria illustrates how the TEN-T programme has been used for financing a planning study covering last-mile infrastructure.

Freight Terminal Wolfurt (Austria)

The project consists of a study for planning activities for the future expansion of the Wolfurt Terminal in Austria. It includes planning for the construction of facilities for intermodal transport, equipment for general cargo, and devices for conventional freight transport. The total costs of the project, 8.730.000 EURO, were equally divided between EU and the Republic of Austria as part of the TEN-T Programme. The project started in 2012 and was finished in 2014.

Form of financing

Most of the EU financial instruments considered, namely six, make available non-refundable financial assistance in the form of **grants**. Marco Polo II (see the box "LHT Intermodal") and Shift2Rail provide solely grants, as compared to the remaining four financial instruments which include also **other forms of financing**, such as prizes, repayable assistance, procurement and financial instruments. Unlike the previous programmes, Marguerite Fund, the EBRD and EIB instruments **do not provide grants**. Instead, support through **other financial instruments** is offered (such as equity, guarantees, loans, mezzanine finance or derivatives). As a concluding remark, the EU instruments dedicated to transport and the ESIF instruments offer most attractive possibilities for financing last-mile infrastructure. However, the differences between these and the remaining instruments can also be taken as an indicator as to the possibility to use different instruments complementarily, for supporting the same project (see for an example of combination of financing in the form of EU grants under ERDF and Cohesion fund with an EIB loan (see the box above "Construction of Thriassio Pedio Complex").

Share of eligible costs & share of EU funding

There is great variation between the EU level instruments considered as far as the **share of funding for eligible project costs** is concerned. Most of the instruments provide for different shares depending on the type of actions that are eligible for financing (e.g. Shift2Rail; TEN-T; ESIF instruments; Marco Polo II). For instance, the TEN-T supported 50 % the eligible costs for the Freight Terminal Wolfurt whereas only a share of 8% of the project costs has been covered by Marco Polo II in the case of the LHT Intermodal. In contrast to the previous, few instruments (EIB and EBRD instruments) provide only an indicative ceiling for all the costs covered, usually expressed in terms like "maximum % of" or "less than 50% of".

Unlike the EBRD instruments, the EIB programmes provide explicitly for the possibility to increase the standard ceiling in exceptional circumstances. Normally, the share of eligible project costs covered under the EU instruments is up to 50% (for a concrete example of a combined share of 50% under ERDF and CF, with an addition al 40% consisting of an EIB loan (see the box "Construction of Thriassio Pedio Complex"). However, in certain circumstances the share of EU funding may be higher, reaching exceptionally 100% (e.g. research and innovation actions financed under Shift2Rail). It may be concluded from this comparative overview that the EU instruments offer a wide range of possibilities for covering partly the eligible project costs. The shares covered under the EU instruments depend on the types of actions, and are flexible in that they can be adjusted according to the specific features and circumstances pertaining to the relevant project.

As regards the **share of EU co-financing** of the programmes and instruments considered, this is expectedly 100% for most of them. In contrast to the previous, Shift2Rail and Marguerite Fund feature a combination of EU funding and other (private and/or public) funding. In the case of the ERBD instruments, it was not possible to determine the share of EU funding. This reveals that beside the EU level instruments fully financed by EU the institutions, inventive solutions, combining EU funding with funding from other sources, have been put in practice recently at European level for supporting investments in infrastructure.

Usage of the programme and funding that can be allocated to last-mile

The desk research revealed only limited information concerning the usage (both in terms of number and in terms of volume of applications) of the EU programmes and instruments considered. The same applies with regard to the determination of the funding that can be allocated to last-mile infrastructure under the EU instruments. Accordingly, it is not possible to perform a comparative assessment under these key drivers.

Eligible beneficiaries & Eligibility criteria

Most EU instruments (TEN-T, ESIF instruments, Marco Polo II) cover a **wide range of potential beneficiaries** ranging from infrastructure managers, public administrations in the Member States, international organizations and joint undertakings, private undertakings and various public-private partnerships. Similarly, the EBRD instruments include generally public and private undertakings among the eligible beneficiaries, whereas Marco Polo II adds a territorial dimension by referring to undertakings established in the Member States or participating countries. By contrast, Shif2Rail seems to target mainly the founding and associated members of the joint undertaking, tough non-members are not excluded per se. In a similar vein, the LGTT instrument provided by EIB is available only to debt providers. Insufficient information has been obtained during desk research with regard to eligible beneficiaries under Marguerite Fund and the SFF instrument.

As regards the **eligibility criteria**, it is generally required that the projects or actions concerned **contribute to attaining the more general or more specific objectives and priorities** of the relevant programme or instrument. Some instruments refer explicitly to actions and projects in the transport sector (Shit2Rail; TEN-T; Marco Polo II; LGTT instrument), whereas in other cases such references are made in the programmes implementing the main instrument (ESIF instruments).

By contrast, **other EU instruments cover all types of actions and projects meeting certain eligibility criteria**, including potentially also transport infrastructure projects (Marguerite Fund, EBRD and EIB- SFF instruments). Sometimes the different EU instruments (e.g. a certain size of the project, meeting certain performance indicators, a territorial requirement, etc.) specify various specific requirements and conditions. From this comparative account, one may infer that the EU instruments considered may cover various projects involving last-mile infrastructure. Moreover, such instruments do not seem in principle exclude each other and, therefore, could be combined with each other for financing the same project.

3.2.3.3. Comparative analysis at Member States level

This section contains a comparative analysis of the non-dedicated support-programmes and instruments at Member State level. Key drivers, as outlined below, are reviewed for the 62 identified programmes and instruments. A comparative matrix is included in Annex F.

Types of investments covered & types of eligible costs

We managed to group the **types of investments** roughly into **four categories** (infrastructure, research, service, and miscellaneous). **Most of these programmes belong to the first category** as their purpose is to develop the national infrastructure, mainly revolves around railway transportation, but sometimes they also include energy, environment, telecommunication, etc. This approach is used for all Member States except Spain where the existing scheme for conducting studies falls under the second category. Austria has already developed the last-mile concept. Austria focuses more on R&D through three of its programmes, leaving one programme for infrastructure and one programme for services. The United Kingdom provides investment for services through the Modal Shift Revenue Support programme. The miscellaneous category addresses programmes that does not fall under the other categories. For example, the Programme d'investissiments d'avenir in France invests in both R&D and infrastructure and the Local Sustainable Transport Fund in the UK invests in resource and capital, providing a very general approach.

As regards the **types of eligible costs**, the desk research revealed overall limited information. From the information available, it appears that in **France and the Netherlands a wide range of project-related costs may be covered by the existing programmes**. On the other hand, the NIB loan only mentions that VAT is not covered. Germany's Förderung von Umschlaganlagen des Kombinierten Verkehrs nichtbundeseigener Unternehmen **covers eligible costs related to its objective of building new or renovating terminals**, as it includes land acquisition, properties settlement, purchase of handling equipment, and construction costs. A similar approach is also taken by Austria, Hungary, Czech Republic, Greece, Hungary, Romania, Slovenia, and the United Kingdom.

Form of financing

There are **five types of financing** under the available instruments: **grant, loan, guarantee, credit, and repayable advances.** Most of the programmes identified provide funding in the form of a grant. For examples of projects in which a direct grant from the state is combined with investment from PPPs, bringing together local or regional authorities and private investors (see boxes below). Loans often come from banks, such as the **Nordic Investment Bank**. **Credits** are also provided in some Member States, such as France with its **Programme d'investissements d'avenir**, The Netherlands through its **Innovatiefonds MKB+**, and United Kingdom in its **Growing Places Fund**. The Nordic Investment Bank also provides an option for **guarantees**. The Netherlands also has programmes that give **guarantees** to its applicants, the **Borgstelling MKB and Garantie Ondernemingsfinanciering**. **Repayable advances** is one of the option available in Programme d'investissements d'avenir from France.

Burghausen Intermodal Terminal

The main purpose of this project is to build a new road & rail intermodal terminal in Burghausen, Bavaria, Germany. This terminal is equipped with four railway sidings as long as 600 m each, paved surfaces that can fit up to 1,000 containers, and a depot that can fit another 800 containers. The beneficiary of this project is KombiTerminal Burghausen (KTB) GmbH. KTB is a consortium of chemical transport specialist DB Schenker BTT GmbH, a German rail/road handling company Deutsche Umschlagsgessellschaft Schiene-Strasse (DUSS), and the freight-forwarding firm Karl Schmidt Spedition GmbH & Co. KG. This project started in 2012 and was finalised in 2014.

The total project cost is 30 million euros. The financing of this project is done by two parties: the first of them is, another consortium called RegioInvest Inn-Salzach GmbH that consists of public and private investors and provides 8.6 million EURO (28,67%) while the rest of the cost is covered by German Federal Railway Authority (Eisenbahn-Bundesamt) that provides to 21.4 million euros (71,33%). Members of RegioInvest Inn-Salzach GmbH are local companies and entities that will receive the benefit from using this intermodal terminal.

Share of eligible costs & share of EU funding

For some programmes, the **share of eligible costs** that can be covered by the funding scheme is **up to 100%,** such as in the case of some of the Operational Programmes in the Central and Eastern European Member States. Examples from the Operational Programme for Transport (OPT) from Bulgaria, Czech Republic and Hungary are presented in the boxes below.

Lovochemie Siding

This project in the Czech Republic concerning the construction of a new siding on the premises of the beneficiary represents a good example of efficient combination of the different funding schemes. The Operational Programme was used as an incentive for the private investor to accomplish the project, co-finance partially also from the national public funds. The beneficiary was a private company, the largest producer of fertilizers in Czech Republic. The EU contribution (through ERDF) was 34% and the national financing constituted 6% out of the total costs (amounting to 47,175,000 CZK). The project started in 2008 and was finalised in 2010.

Industrial Park in the city of Győr

In an effort to improve the local economy, the City of Győr, Hungary, extended the existing last-mile infrastructure in the city's growing industrial part with 1.9 km. This provided direct access to railways to a larger area within the park. This way, the city wanted to make it more attractive for companies to move their business to Győr. Since its inauguration, the new last-mile infrastructure is used by 120 trains every month and is expected to bring new companies to the city and create new jobs for the local people. The project costs were 800m Forint (approx. €2.7m). The costs were co-financed by the EU and the Hungarian Government (65%) and by the city of Győr (35%). The project was undertaken in the years 2013-2014.

The development of the last-mile in the river-maritime sector of the Port of Constanta (Romania)

The project entails building railway infrastructure in the Port of Constanta, to serve the current and future port operators. In the first stage, which is the subject of the mentioned project, only railways serving current operators will be built. The total costs of the project is circa 94.779.144 RON; 85% were funded through ERDF and 15% from state budget.

The programmes cover shares ranging from a **minimum of 10%, 30%, and 50% up to a maximum of 90%**. This variety is not necessarily determined the differences existing between various Member States. In this respect, it should be noted that in Austria there is a programme that can finance up to 100% of the eligible costs, (i.e. Beihilfe des Bundes für die Erbringung von Schienengüterverkehrsleistungen in bestimmten Produktionsformen in Österreich), and also a programme that can only finance up to 50% of the eligible costs (Innovationsförderprogramm Kombinierter Güterverkehr).

The Nordic Investment Bank Loan and Northern Dimension Partnership on Transport and Logistic Support Fund that exist in Nordic countries for example **only gives loans that cover up to 50% of the project cost**. The Brede Doeluitkering Verkeer en Vervoer (BDU) programme from Netherlands is different from others as it provides for a different threshold of the value of the project based on a geographical criterion (below €225 million in the Amsterdam-Den Haag-Rotterdam area, as compared to €112.5 million in the rest of the country) for establishing the share of eligible costs that can be covered. For some programmes, no information was available with regard to this key driver (see Table 22).

As mentioned before the **share of EU funding** is only applicable for Operational Programmes (OP) because these combine sources from both EU and national budgets. **These programmes only exist in Eastern, South, and Southeast Europe** as these parts of Europe consist of developing countries and newer Member States. The share of EU funding is quite significant. The smallest share of EU funding being featured by the Greece Operational Programme "Improvement of Accessibility" with only 75%, whereas the biggest share (100%) is found in the Operational Programme Competitiveness and Cohesion (OPCC) from Croatia. For the rest of the OPs the EU share stands around 85%. There is one unique programme, Státní Fond Dopravní Infrastruktury from Czech Republic where the EU share is given as a number of 5.8 million CZK for the period 2007-2020 (approx. €211 thousand) instead of providing it in percentage.

Usage of programme

This part of the comparative matrix is poorly filled as such **information is very scarce**. Out of all Member States, **only nine programmes provided information on the usage of programme**. Even for some of these Member States this aspect is partly covered. For example, for Austrian Innovationsförderprogramm Kombinierter Güterverkehr programme only the number of applications is given, 20, without the volume of it. The same occurs in Italy's Operational Programme "Network & Mobility" with 98 applications. Meanwhile the Austrian Intelligent Transport Systems and Services Plus (IV2S) – National programme is very detailed and include the information about the total number of applications (430) as well as about the number of applications that were granted (200). The total funding volume under this programme amounts to €47 million.

The most extensive information in this regard has been obtained for the United Kingdom. For example, within the Local Sustainable Transport Fund programme there were 96 accepted and 19 refused applications with the volume of £539 million (approx. €742) during the period from 2011-2015. Unfortunately, the very limited information available on this aspect does not allow an appropriate comparative analysis.

Funding that can be allocated to last-mile infrastructure

The scarce information obtained from the desk research and the stakeholder consultation process does not allow for a comparative analysis of this key driver. The reason for this is that the instruments tackled in this section are not directly focused on last-mile infrastructure and, therefore, the information concerning this aspect was often missing. While in some OP the amount of funding was deducted from the budget available for freight transport, in almost all national funding schemes this approach could not be used due to the specificity of the instruments and the general information available as regards their budget.

Eligible beneficiaries & eligibility criteria

To compare the **eligible beneficiaries** in different financial instruments, it can be seen that usually they are almost the same in every Member State. Taking into account the plural number of instruments available in most of Member States, the recurring eligible beneficiaries in all Member States consist mostly of public entities and private companies or private undertakings relevant to transport industry. **The only two exceptions are** the Operational Programme Transport in Bulgaria and Financing Agreement with the Grand Canary Island Council, on Rail Infrastructure in Spain, where the financial instrument was targeted to particular beneficiaries chosen in advance and listed as the only eligible beneficiaries under the instrument.

Only 24 out of 62 identified financial instruments provide information concerning the **eligibility criteria**. This applies mostly to the EU funded Operational Programmes or the Nordic Investment Bank funding. Also considering the information available particular financial instruments differ depending on the purpose of the funding. On one hand there are the OPs with extensive coverage, which impose very general criteria, mostly referring to the general objectives and priorities of the given programme or the ability to co-finance the project if necessary, similar in all Member States. In contrast, there is a number of highly targeted national funds, which impose very specific criteria such in the case of the Funding for Combined Transportation Terminals for Non-Federal Undertaking in Germany.

Pilot Member States

Below, a brief illustration of the various programmes is given through two pilot Member States (Germany and Poland). **Germany is an example of a pro-active Member State** as regards the development and the financing of last-mile infrastructure, whereas **Poland may serve as model for** support to last-mile infrastructure in particular for the **Central and Eastern European countries**.

Germany

Germany has a **supporting policy towards last-mile infrastructure**. Besides the “Offensive Gleisanschluss” programme that is dedicated for railway sidings, there are **three other financing schemes that can be allocated for last mile infrastructures**, such as:

- The Infrastructure Acceleration Programme;
- Funding for Combined Transportation Terminals programme;
- The United Germany Transportation Project.

All of these support programmes are funded from the **national budget** managed by the Federal Ministry of Transportation and Digital Infrastructure. These programmes can be used **either alone or in combination with other financial instruments and incentives** for supporting projects covering last-mile infrastructure. Germany also has well-developed last-mile infrastructure. For example, the Port of Duisburg has one of the biggest inland waterway terminal in the world, including well-functioning last-mile infrastructure. Germany can be considered as an exemplary Member State regarding implementation and financing opportunities in the field of last-mile infrastructure.

Poland

Poland makes effectively use of diverse funding instruments that could be related to last-mile infrastructure. **Seven funding schemes have been identified in Poland**, specifically:

- Four (4) Operational Programmes from the European Union;
- Two (2) funding schemes from the Nordic Investment Bank;
- One (1) purely national programme for investment, including transport infrastructure and industrial networks.

Five of the programmes represent **grants available** and **two of them work on the concept of loan**. Poland seems to actively use the instruments available, taking into account the high numbers of usage of two most relevant programmes in the country.

The investment coverage is diverse. **From very broad programmes**, which cover investment in research and development of infrastructure in general or improvement of transport accessibility in eco-friendly ways, the focus switches to **construction and modernization of railway infrastructure**, and in some cases more specifically construction and reconstruction of **factory sidings** (Operational Programme "Infrastructure and Environment").

Eligibility criteria and eligible beneficiaries **are not easily accessible**. However, taking into consideration the nature of the funding schemes, it can be assumed that eligible beneficiaries are mostly private companies and public entities in general with possible territorial limitations, whereas the eligibility criterion is mostly focused on enhancing development of the country and its transport infrastructure and securing satisfactory financial means for full realization of the co-finance projects.

For programmes being funded by the EU, **the share of EU financing range from 75%-85% of the total funding**. The share of eligible cost differs according to the source of funding and form of financing. Grants from EU offer a share of eligible costs up to 100%, whereas national and international loans provide substantially smaller share depending on the size of the project concerned.

3.2.4. Evaluation of the other programmes/instruments

This section presents the results of the evaluation of the most relevant non-dedicated funding programmes on the basis of their concept and impact. The evaluation is based on the information as presented in the previous sections of this chapter.

The subject of the evaluation is not the programme or instrument as a whole, but the contribution of the programme or instrument to the development of last-mile infrastructure. In the evaluation, we consider two aspects, i.e. (i) the **evaluation of the concept** of the programme or instrument and (ii) the **evaluation of the impact** of the programme or instrument.

3.2.4.1. Evaluation of the concept

The evaluation of the concept of the non-dedicated programmes is based on the evaluation criteria as presented below.

Effectiveness

Evaluation question: *Is the programme/instrument suitable for achieving the objective of the development of the last-mile infrastructure? To what extent?*

The findings from desk research complemented by the information available from the stakeholder consultation indicates that a number of the ancillary programmes identified **are suitable for achieving the objective of the development of last-mile infrastructure**. This is especially the case for those initiatives that we have labelled "Highly Relevant". These encompass six EU level instruments[39] and 16 instruments available at the

[39] Shift2Rail, Connection Europe Facility (CEF), European Regional Development Fund (HR), Cohesion Fund (HR), TEN-T Program, Marco Polo II.

Member States level in Austria (1), Czech Republic (1), Germany (1), Hungary (1), Italy (1), Lithuania (1), Netherlands (3), Poland (3), Romania (1), Slovakia (1), Slovenia (1), and UK[40] (1).[41]

The suitability of these instruments for last-mile infrastructure **results from their design** in that they are **fully or partly dedicated to transport infrastructure** in such a way that various actions regarding **last-mile infrastructure could become eligible for financing**. Moreover, for some of the programmes, their suitability for the development of last-mile infrastructure has been confirmed by concrete examples of projects involving last-mile infrastructure.

For example, we found last-mile projects in the Transport Operational Programmes in a number of Member States, including Romania, Czech Republic, Hungary and Greece.[42] The use of the TEN-T funding for developing the last-mile infrastructure has been identified in a range of Member States, including Austria,[43] Italy,[44] Sweden,[45] and UK[46]. Furthermore, under the newly established Shift2Rail Joint Undertaking, the European Commission following the first "Mobility for Growth" call of the Horizon 2020 Programme has selected the IN2Rail project recently. The IN2Rail project addresses the Intelligent Infrastructure pillar of Shift2Rail, with a potential contribution to the development of last-mile infrastructure[47]. Looking at project level, the Marco Polo II Programme has proven to be a suitable instrument for last-mile infrastructure, with almost 100 projects funded that can be related to last-mile aspects during the period 2007-2013.

Suitability

Evaluation question: *Is the programme/instrument suitable for the different EU country realities?*

The EU level programmes appear to be **overall adapted to the diversity characterizing the Member States across the European Union**. In this regard, certain EU level instruments are more suitable or better applicable for specific Member States in view of their specific economic and financial features. ERDF and Cohesion Funds, for example, provide significant support for transport infrastructure for the Central and Eastern European countries. Whereas programmes, such as TEN-T, CEF, Marco Polo II and Shift2Rail cover all Member States in view of their overall objective to support the development of EU-wide transport infrastructure. These instruments often provide the possibility to co-finance various projects up to a maximum ceiling or between a minimum and a maximum level, which allows for flexibility in order to respond to the different financing options and conditions existing in the Member States.

The national programmes obviously are designed to respond to the specific Member State realities.

Implementation time

Evaluation question: *How long does it take since start-up before the programme/instrument delivers tangible benefits with regard to the development of last-mile infrastructure?*

Limited information could be obtained in order to answer this evaluation question comprehensively. The implementation time required for the relevant projects depends largely on the design of the programmes. For instance, in the case of Marco Polo II the requirement that the projects financed must achieve tangible results within a certain period is an important design feature of the programme. In this regard, it should be noted that

[40] As indicated in Table 11, the Freight Facilities Grant is only applicable in parts of the UK.
[41] The 16 highly relevant programmes available at Member States level includes the following: Austria (Innovation Program for Combined Freight Transport); Czech Republic (Operational Program "Transport"); Germany (Funding for Combined Transportation Terminals for Non-Federal Undertakings); Hungary (Transport Operational Program); Italy (Operational Program "Network and Mobility"); Lithuania (Operational Program for EU Structural Funds Investments for 2014-2020); Netherlands (Hoogfrequent Spoorvervoer; Infrastructuurfonds; BDU 'Brede Doeluitkering Verkeer en Vervoer'); Poland (Operational Program 'Infrastructure and Environment' 2007-2013; Operational Program 'Infrastructure and Environment' 2014-2020; Polish Investment Program); Romania (Operational Program Transport); Slovakia (Operational Program "Integrated Infrastructure"); Slovenia (Operational Program "Development of Environment and Transport Infrastructure"); United Kingdom (Freight Facilities Grant).
[42] The development of the last-mile in the river-maritime sector of the Port of Constanta (Romania); Extending siding on the premises of Lovochemie, Inc. (Czech Republic); Extension of last-mile infrastructure in the local industrial park in the city of Győr (Hungary); Construction of Thriassio Pedio Complex (Greece).
[43] E.g. Freight Terminal Wolfurt – Planning; Intermodal Terminal Wörgl (TEN-T Priority Project 1 - Section Kufstein-Innsbruck).
[44] E.g. Ramping up rail terminal facilities at the Port of Venice (2007-IT-91503-P).
[45] Establishment of infrastructure facilities at Norra Hamnen in Malmö for modal shift between sea.
[46] E.g. Port Salford Global Project.
[47] The IN2Rail is to set the foundations for a resilient, consistent, cost efficient, high capacity European network by delivering important building blocks that unlock the innovation potential that exists in Shift2Rail: innovative technologies will be explored and resulting concepts embedded in a systems framework where infrastructure, information management, maintenance techniques, energy, and engineering are integrated, optimised, shared and exploited.– UNIFE / Kick-Off of three Shift2Rail lighthouse projects: Roll2Rail, IT2Rail and In2Rail http://www.unife.org/news/115-kick-off-of-three-shift2rail-lighthouse-projects-roll2rail-it2rail-and-in2rail.html

under the Call for Proposals 2013, an eligibility criterion for the actions financed under this programme is that they must achieve their objectives in a period varying between 12-60 months, depending on the type of action[48].

For ERDF and Cohesion Funds more detailed information might be provided in the various operational programmes available in the Member States. In the case of the TEN-T programme, the implementation schedule of some of the funded projects indicates that the materialization of the projects normally starts in the year when the financing has been granted and takes between 2 to 5 years until full completion[49].

Impact on competitiveness of rail transport

Evaluation question: *Does the programme or instrument create obstacles to the use of rail freight transport, particularly on the main European corridors?*

The findings from desk research and from the stakeholder consultation **did not reveal clear evidence** regarding potential or actual hindrances created by the programmes and instruments identified as to the use of rail freight transport. It should be noted that these programmes and instruments **are generally aimed at contributing to the development of the transport sector**, including rail freight infrastructure and services. Moreover, many of the EU programmes emphasize the importance of modal shift, providing a potential stimulus for the rail freight sector.

Administrative feasibility and cost

Evaluation question: *Does the programme or instrument create an additional administrative burden for the rail sector and what are the related costs?*

In general, the programmes and instruments **require effort in preparation, often in the form of feasibility studies** (ERDF, Cohesion Fund) or **proposals** (Shift2Rail, TEN-T, Marco Polo). This can come with substantial administrative burden, depending on the programme or instrument, also from the rail sector. The absorption capacity of ERDF and Cohesion Funds has been limited for a long period as a result of lack of capacity to submit high quality project applications. This is illustrative for the substantial effort that is needed to prepare the applications.

For example in Hungary's Transport Operational Programme report of 2009, they state to commit to the continued development of the institutional system in order to ensure appropriate institutional capacities, this can be realised thanks to increasing of the budget of the development plan and the EU's contribution. Hungary decided to the structural reform of the institutional system, would allow achieving both the increase of the efficiency of task assignment and operational management as well as the extension of administrative capacities. These kind of investments and developments on (administrative) capacity are necessary in order to have an effective and working Operational Programme. The fact that the European Investment Bank has created the JASPERS facility, to support new Member States preparing high quality applications by providing technical assistance, is an indication of the effort needed. In the Marco Polo II programme applicants have to comply with a list of criteria and have to submit evidence thereof in a proposal (e.g. financial capacity, technical capacity, explanation of current route and new "modally shifter" route).[50]

Effort is also required in **monitoring the progress of projects implemented** under a programme or instrument. For Marco Polo II, the applicant has to report on the progress of the project in order to be monitored on the achieved results[51]. The monitoring system of TEN-T programme requires the beneficiaries to submit action status reports (ASR) and be monitored regulatory on the basis of their strategic action plans (SAP). Here the beneficiary has to provide different kinds of information (e.g. risk and time management, technical, progress, milestones).

Consistency with the existing legal framework

[48] European Commission , Transport , Marco Polo , Getting funds – http://ec.europa.eu/transport/marcopolo/getting-funds/application-packs/2013/index_en.htm

[49] http://inea.ec.europa.eu/en/ten-t/ten-t_projects/ten-t_projects_by_transport_mode/rail_includes_ertms.htm

[50] MARCO POLO II, *CALL FOR PROPOSALS 2011* , available at ,http://ec.europa.eu/transport/marcopolo/files/calls/docs/2011/full_call_text_2011_en.pdf Section 3

[51] REGULATION (EC) No 923/2009 available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:266:0001:0010:EN:PDF
Europe Economics Chancery House , *Evaluation of the Marco Polo Program 2003-2010*, available at http://ec.europa.eu/transport/facts-fundings/evaluations/doc/2011_marco-polo-program-2003-2010.pdf

Evaluation question: *Does the programme or instrument fit into the existing European and national legal framework?*

The design of EU programmes or instruments **is subject to a careful review of coherence**, often as part of an ex-ante evaluation or impact assessment process. In the assessment of coherence, the focus is on the extent to which the intervention does not contradict other interventions with similar objectives[52]. As such, a safeguard is built into the design system of new EU programmes or instruments to provide a fit with the existing European legal framework.

When looking at the Operational Programmes, and the use of the ERDF and Cohesion Funds, **both the Commission and the Member States have to ensure that assistance from the Funds is consistent with the activities, policies and priorities of the Community** and **guarantee the complementary** to other financial instruments of the Community. In order to do so this consistency and complementarity shall be indicated in particular in Community strategic guidelines on cohesion, in the national strategic reference framework and in the Operational Programmes itself[53].

According to the final report on the Marco Polo II programme for the period 2007 - 2011, comparing Marco Polo II with relevant Member State programmes results in the notion that Marco Polo II is coherent with the national programmes and that there is no sign of contra-productivity or large conflicts of interest. An important reason mentioned is that both the Member State and the EU have the same objective, namely shifting freight transport off the roads. However, the majority of Member State programmes aim at national objectives, whereas Marco Polo II is focusing on international freight transport, hence is complementary to most of the national programmes and does not cause any conflicts with the existing legal frameworks.

When taking into consideration the TEN-T programme, Marco Polo II has an intrinsically different nature. TEN-T is an instrument to construct a European infrastructure network, with long-term goals, whereas Marco Polo is a market-oriented, demand driven instrument focusing on sustained modal shift achieved by transport services. The goals of these programmes differ in such a way that there would not arise any conflicts between the existing legal frameworks.

It can be concluded that **coherence is incorporated in the design of EU programmes** and instruments. We have not encountered cases in which friction appeared between the programme and instrument in our analysis.

Traceability of the results

Evaluation question: *Does the programme or instrument easily allow its effects and costs to be monitored?*

In general, **monitoring costs is manageable**, **but monitoring effects of projects financed through the mentioned programmes and instruments is complex**. Attribution of effects complicates matters. Notwithstanding the above, some programmes or instruments require monitoring the effects. For example, the Marco Polo II Programme requires monitoring and evaluation. In order to determine whether the project fulfils its expectation, it is crucial to report on the progress of the projects and make strategic evaluations on a regular basis. Field visits by experts in this subject field are a part of this task as well[54]. Monitoring of effects is also needed for TEN-T projects, as stated above.

When looking at the national level, monitoring of operational programmes **is necessary to ensure the quality of their implementation**. In order to do so an Operational Programme Monitoring Committee (MC) has to be set up within three months of the decision approving the programme. However, Member States have the primary responsibility on the monitoring of operational programmes, they are to carry out evaluations and the results have to be sent to the monitoring committee for the Operational Programme and to the Commission[55].

With regard to the monitoring system of the CEF, Member States need to undertake the technical monitoring and financial control of actions in close cooperation with the Commission. The Member State need to report on

[52] Evaluating EU Activities, a Practical Guide for the Commission Services (2004).
[53] Article 9, Council Regulation (EC) No 1083/2006 available at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006R1083
[54] ECORYS Nederland BV, *Program monitoring & evaluation,* available at http://ec.europa.eu/transport/facts-fundings/evaluations/doc/2007_marco_polo_2.pdf
[55] Para (64), Art. 48, Art. 63 Council Regulation (EC) No 1083/2006 available at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006R1083

the progress annually to the Commission, which will in turn monitor the implementation and publicly report on the progress.

Complementary nature

Evaluation question: *Is it possible to combine two or more programmes or instruments without any negative impact on their individual effectiveness and efficiency?*

The overall assessment of the programmes and instruments available at EU and Member State levels **indicates that there are various possibilities for combining them** in order to support projects in the transport sector. At EU level, the complementary nature of the relevant programme and instrument is normally part of its design. CEF, for instance, is specifically designed to provide contributions to innovative financial instruments, developed together with entrusted financial institutions, such as the European Investment Bank, i.e. through the Marguerite Fund, the Loan Guarantee for TEN Transport (LGTT) and the Project Bond Initiative[56].

Moreover, a **clear link is established between the CEF and the Cohesion Fund** in that an important part of the funds available under this framework is directed to Member States eligible for the Cohesion fund[57]. In addition, Shift2Rail indicates explicitly that links must be established with CEF, as well as with the ESIF instruments[58]. The TEN-T Programme has always been used to co-finance transport infrastructure projects in combination with various funding sources, including national and regional/local funding[59]. Also the overall TEN-T financial envelope included €500 million for the Loan Guarantee Instrument (LGTT), an innovative financial instrument set up and developed jointly by the European Commission and the European Investment Bank aiming at facilitating a larger participation of the private sector in the financing of TEN-T infrastructure[60].

ERDF and Cohesion Funds are always combined to different extents with national funding through the Operational Programmes available in the Member States (See Annex E)[61]. Moreover, at project level, financing from ERDF and Cohesion Funds is used complementary to other EU instruments, such as EIB loans[62]. Finally, Marco Polo II Programme was used as complementary source of funding for last-mile projects up to a 35% share in accordance with the Marco Polo Regulation[63]. The concrete example of LHT Intermodal project (Port of Antwerp, Belgium) also illustrates how funding under this programme played a supporting role in combination with regional funding, bank loans, and private investment (see chapter 5.1.1).

3.2.4.2. Evaluation of the impact

The evaluation of the impact of the ancillary programmes is based on the evaluation criteria as presented below.

Number of projects financed and completed

Evaluation question: *How many last-mile project have been financed and completed under the various ancillary programmes?*

The data collected so far **provide a complete overview of the last-mile projects funded only under the Marco Polo II programme**. Thus, for the period 2007-2013, 98 out of the 174 projects funded by Marco Polo are, according to our assessment, related to last-mile[64]. In the case of the recently crated Shift2rail undertaking, one of the three projects selected by the European Commission in 2015 following the first

[56] European Commission / Transport / Transport themes / New TEN-T guidelines and CEF / Project funding under CEF, http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/project-funding/cef_en.htm
[57] European Commission / Transport / Transport themes / New TEN-T guidelines and CEF / Project funding under CEF, http://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/project-funding/cef_en.htm
[58] Article 14(4) of Regulation 642/2014.
[59] See for concrete examples financed under the TEN-T program, Innovation and Networks Executive Agency (INEA) / Projects: 2007-2013 Financial Framework http://inea.ec.europa.eu/en/ten-t/ten-t_projects/ten-t_projects_by_year/projects_2007-2013_financial_framework.htm
[60] Innovation and Networks Executive Agency (INEA) / TENT / Funding possibilities: http://inea.ec.europa.eu/en/ten-t/apply_for_funding/follow_the_funding_process/follow_the_funding_process.htm
[61] The only exception is the Operational Program Competitiveness and Cohesion in Croatia, which is 100% EU funded.
[62] E.g. Extending siding on the premises of Lovochemie, Inc. (Czech Republic); Extension of last-mile infrastructure in the local industrial park in the city of Győr (Hungary); Construction of Thriassio Pedio Complex (Greece).
[63] See Annex to Regulation (EC) No 1692/2006. See also for concrete examples, 2009 Call for Proposals: Funded Projects, European Commission /Transport / Marco Polo / Marco Polo in action http://ec.europa.eu/transport/marcopolo/in-action/index_en.htm
[64] European Commission / Transport / Marco Polo / About the programme / Beneficiaries: http://ec.europa.eu/transport/marcopolo/about/in-law/beneficiaries/index_en.htm

"Mobility for Growth" call of the Horizon 2020 Programme cover last-mile[65]. For the TEN-T programme, the brochures presenting the yearly 10 TEN-T project implementation successes mention one last-mile related projects (out of ten) in 2011, two (out of ten) in 2012, two (out of ten) in 2013.[66]

No centralized information regarding the total number of projects financed under ERDF and Cohesion Funds could be used because of the fact that these programmes are being implemented via various Operational Programmes covering an important number of Member States. However, the project examples identified in the Operational Programmes of Member States indicate that last-mile projects are indeed financed under these instruments[67].

Amount of funding involved

Evaluation question: *How much funding was involved in the projects implemented under the various ancillary programmes?*

Only limited information could be obtained with regard to the **funding allocated to last-mile under the different EU and Member State level programmes and instruments**. In the few cases where exact amounts are mentioned, the finding is mostly deducted from the financing targeted to freight infrastructure, assuming that it might be potentially available for last-mile infrastructure. The figures deducted on the basis of the information available mostly in various Operational Programmes in the Member States indicate different shares ranging from less than 10 % up to an average of 20-40% funding available for last-mile infrastructure out of the total funding volume (see Annex E). A national programme, the Dutch BDU 'Brede Doeluitkering Verkeer en Vervoer' features a share of 25% that could be allocated to last-mile (see Annex E).

Examples of projects illustrate the share of funding allocated through the various programmes and instruments. For example, the Lovchemie Siding project in Czech Republic (see project example mentioned earlier in this section) features a 34% share supported through ERDF of total project costs amounting to some EUR 1.7 million[68]. The construction of Thriassio Pedio Complex (Greece) entails an allocation amounting to 50% of the project costs through the Cohesion Fund supplemented with an EIB loan up to 90% of the project costs. The example of Freight Terminal Wolfurt – Planning; Intermodal Terminal Wörgl (Austria) illustrates that the funding under the TEN-T programme could go as far as 50% of the eligible project costs.

Increase in rail transport volumes and modal shift

Evaluation question: *How are rail volumes and modal split affected as a result of the projects implemented under the various ancillary programmes?*

There is little information provided in a structured way on **how the projects implemented under the various ancillary programmes affect rail volumes or modal split**. At best, this can be reviewed at an individual project level and even then little information is available. There are general difficulties in this respect, such as (i) availability of data and (ii) the extent to which changes in rail volumes and modal shift can be attributed to a project. An exception is the Marco Polo II programme. The overall objective of this programme is **to shift freight from roads to alternative modes of transport**. Two actions in Marco Polo Ii are especially relevant for last-mile projects, i.e. the modal shift and the catalyst action. For both type of actions the Marco Polo Regulation[69] defines that "the Community financial assistance determined by the Commission on the basis of the tonne-kilometres shifted from road to short sea shipping, rail and inland waterways shall initially be set at EUR 2 for each shift of 500 tonne-kilometres of road freight". Applying this ratio to the total EU contribution for relevant Marco Polo project will result in an estimate of modal shift. For example, in the 2013 call 27 projects were selected for funding, out of which 25 projects were a modal shift action, representing a total EC contribution of EUR 41,675,767. Applying the formula, this contributes to a minimum of 10,419 million tonne-kilometres shifted from road. We would need to zoom in on the projects with real last-mile potential. The "LHT Intermodal" project, that is mentioned as one of the example projects earlier

[65] UNIFE / Kick-Off of three Shift2Rail lighthouse projects: Roll2Rail, IT2Rail and In2Rail http://www.unife.org/news/115-kick-off-of-three-shift2rail-lighthouse-projects-roll2rail-it2rail-and-in2rail.html
[66] European Commission, TEN-T Project Implementation Successes : http://inea.ec.europa.eu/en/ten-t/ten-t_implementation_successes/project_implementation_successes.htm :
[67] E.g. The development of the last-mile in the river-maritime sector of the Port of Constanta (Romania); Extending siding on the premises of Lovochemie, Inc. (Czech Republic); Extension of last-mile infrastructure in the local industrial park in the city of Győr (Hungary); Construction of Thriassio Pedio Complex (Greece).
[68] Based on an exchange rate of 0.0365780 Czech Koruna: 1 EURO (May 2015).
[69] Regulation (EC) No 1692/2006 of the European Parliament and of the Council of 24 October 2006.

in this chapter, and is selected in the 2013 call, received 737,755 EU contribution. It can be included that at least 184 million tonne-kilometres are shifted from road to rail.

3.2.5. Case Study: Hungarian Operational Programme Transport

On 1 August 2007, the European Commission approved Hungary's Operational Programme for Transport for the period 2007-13. The Operational Programme fell within the framework laid out for the Convergence Objective and had a total budget of around € 7.3 billion. Community assistance through the **European Regional Development Fund** (ERDF) and the **Cohesion Fund** amounts to some € 6.2 billion, which represented approximately 24.5% of the total EU investment earmarked for Hungary under the Cohesion Policy for 2007-13[70].

3.2.5.1. Expected impact of the investment

The Programme's impact included:

- Constructing about 330 km of new expressways;
- Modernising about 500 km of railway track, including the upgrade of IT, safety and traffic control equipment;
- Upgrading about 1100 km of roads so that they can take an 11.5 tonnes axle load capacity.

The Programme provided Hungary with a host of new urban transport systems including a sub-urban railway for Budapest. In addition, urban transport was improved in Hungary's major regional centres through investment in infrastructure such as trams, trolley buses, intermodal hubs, etc.

3.2.5.2. Priorities of the Programme

The Operational Programme was structured around the following priorities. The investment regarding the last mile infrastructure was included into the **Priority 4**.

Table 23 - Priorities of the Hungarian Operational Programme for Transport

Priorities	Title	Description
Priority 1	Improving international accessibility to the country's road network and regional centers	• Increasing international access to Hungary; • Improving the access to regional centers via the road network; • Developing Hungarian motorways and expressways that form part of the EU's TEN-T
Priority 2	Improving international accessibility to the country's rail and waterway networks	• Developing Hungarian railways lines that are part of the TEN-T rail network; • Developing relevant information technology and telematics and investing in safety measures; • Developing the Danube as an EU inland waterway corridor
Priority 3	Improving regional accessibility	• Improving accessibility to Hungary's regional centers; • Developing main roads to improve links between regions and TEN-T network
Priority 4	Linking modes of transport and improving the intermodality and transport infrastructure of economic centers	• Developing infrastructure for intelligent traffic management; • Improving accessibility in economical and environmentally friendly ways; • Developing better infrastructure links between the

[70] http://ec.europa.eu/regional_policy/it/atlas/programmes/2007-2013/hungary/operational-programme-transport-5

		country's main transport networks and important commercial hubs like ports and industrial estates
Priority 5	Improving urban and sub-urban public transport	• Tackling overcrowding on urban transport networks; • Improving conditions and services for users
Priority 6	Technical assistance	• Providing technical assistance to implement the programme

In the following table, the financing plan of the operational transport programme is reported.

Table 24 - Financing plan of the Operational Programme for Transport

Priorities	Source	UE funding	Domestic funding	Total funding
Priority 1	Cohesion fund	1.182.619.139	208.697.495	1.391.316.634
Priority 2	Cohesion fund	1.721.106.773	303.724.725	2.024.831.498
Priority 3	ERDF	1.526.986.617	269.468.227	1.796.454.844
Priority 4	ERDF	152.074.457	28.836.669	178.911.126
Priority 5	Cohesion fund	1.558.804.069	275.083.071	1.833.887.140
Priority 6	Cohesion fund	81.838.094	14.442.017	96.280.111

3.2.6. Summarised conclusions

The inventory of other programmes indicates that 10 EU programmes and 16 Member States programmes are considered highly relevant for last-mile infrastructure. This classification (highly relevant) is based on the focus of these programmes on transport infrastructure, including rail infrastructure, potentially including last-mile infrastructure. A review of the most relevant programmes indicate that many programmes at EU level focus on investment in infrastructure (TEN-T, CEF, ERDF, Cohesion Fund, EBRD and EIB facilities), while other programmes focus on services and infrastructure (Marco Polo II) and research and innovation (Shift2Rail). Although infrastructure financing provides the most direct link to last-mile infrastructure, we believe Shift2Rail also plays a role in bringing innovations from research to market, including last-mile infrastructure. In the Member States programmes, there is a similar focus on investment in infrastructure. Most of the incentives to last-mile infrastructure comes in the form of financial support, notably through grants, although loans and guarantees are also applied. Other incentives, such as concessions and tax agreements, are also used, but on a much less frequent basis. Most EU funded programmes require co-financing, which varies per programme. The usage of the programmes for last-mile infrastructure, and consequently the impact, is difficult to measure across the board. Some programmes, such as Marco Polo II, provide a clear overview of projects with (a component of) last-mile infrastructure, which is substantial. For other programmes, this is more complex to assess. However, we have found clear examples of last-mile infrastructure projects in specific programmes, such as TEN-T and ERDF and Cohesion Funds, as reported in this section.

4. Investment needs/potential in EU

4.1. Introduction

In the framework of the study, **this task** (see paragraph 1.2) **focused on the quantification of the future investment needs for last-mile infrastructure in Europe**. This exercise has been carried out based on (1) the definition of Last-mile infrastructure (see chapter 1.3), (2) the types of last-mile infrastructure (see chapter 1.3.1), (3) a comprehensive analysis of the determining current market conditions and most likely future developments market for rail freight in Europe considering the following questions:

- What number of last-mile infrastructure do we have to consider in Europe ("inventory")?
- What are the current market conditions for rail freight in Europe?
- Which are the relevant technical and operational trends affecting the use and design of last-mile infrastructure?
- What are the most likely future market conditions for rail freight in Europe?
- What investments needs are expected?

Since there was no available comprehensive data base, neither on the existing last-mile infrastructure, nor on the future demand in Europe respectively the concerned countries, the consultants had to elaborate an own data base for the current situation and a forecast for the most likely future framework conditions for rail freight and last-mile infrastructure. This exercise has been carried out based on the following sources:

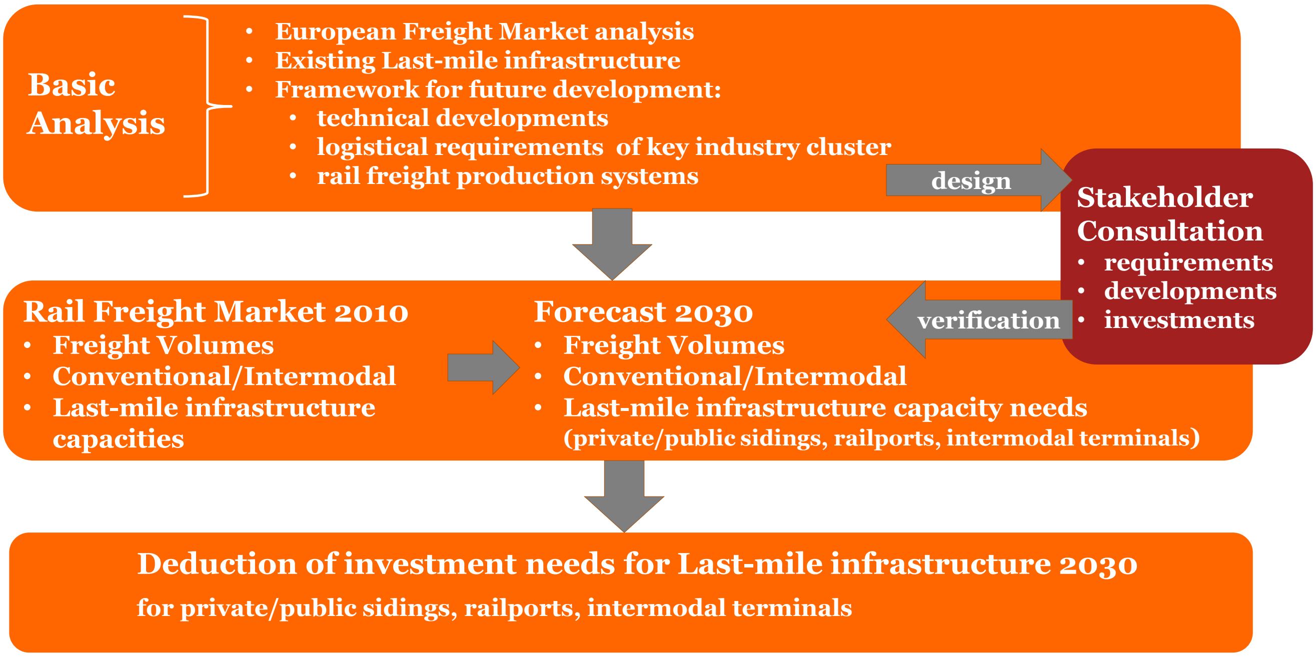
- Statistical data and relevant studies on European and national level for the analysis of current rail freight volumes and relevant future market developments;
- Desktop research for the analysis on the existing last-mile infrastructure, relevant technical developments and market trends affecting the requirements on last-mile infrastructure;
- A web-based stakeholder consultation involving both users and owners of last-mile infrastructure, supplemented by additional expert's consultation on specific topics.

Available results of the previous work packages have also been taken into consideration. This particularly refers to the main four types of last mile infrastructure, including their specific characteristics, which are the basis for all subsequent analyses (see chapter 1.3):

- Private sidings;
- Stations with public sidings;
- Intermodal terminals;
- Railports.

In order to achieve the goals listed above, the following workflow, consisting of three main steps has been applied (Figure 25).

Figure 25 – Methodology and main work steps



Source: HaCon

In order to show a comprehensive picture on the current situation of freight transport in Europe, **a basic analysis of the framework conditions of the respective national freight markets and a further in-depth analysis of the rail freight market has been carried out**. This exercise included the evaluation of total transport volumes, modal shares and commodities. For rail, **also information on freight volumes for conventional and intermodal transport has been gathered. Additionally, an overview on the existing last-mile infrastructure per country was executed**.

In parallel to the collection and evaluation of statistical data, an investigation of relevant trends and developments in the European rail freight and logistics market influencing the requirements on last-mile infrastructure has been made. This survey included both an analysis of developments regarding rail freight production systems (traditional and new concepts) as well as relevant technical developments in particular for shunting operation and wagon technology.

As an official 2030 rail freight forecast providing the necessary information was available neither for entire Europe nor for many of the concerned countries, it has been found necessary to elaborate these forecast values in the framework of this study. This has been carried out based on a forecast model that considers 2010 as a reference year, the results of the market development analysis as well as country forecast and additional relevant studies. The forecast results information on freight volumes for intermodal and conventional transport and the corresponding capacity needs per type of last-mile infrastructure in 2030 for three scenarios.

Supporting the basic analysis and the 2030 forecast, a stakeholder consultation has been carried out. Main goals were the collection of structural data, current as well as future requirements and planning activities considering different types of last-mile infrastructure and users. This stakeholder survey has been used for the verification and validation of presumptions and results of the 2030 forecast.

Based on the forecast outcome, financial needs for new construction and upgrade of last-mile infrastructure in Europe as well as for the corresponding maintenance costs have been deducted. In order to refer to different kinds of funding strategies, these financial needs have been specified for three scenarios, four types of last-mile infrastructure and four country clusters.

4.2. Last-mile infrastructure for rail freight

4.2.1. Overview on last-mile infrastructure for rail freight in Europe

The occurrence of the defined types of last-mile infrastructure in the European countries has been examined. The outcome provides important results in several respects:

- The number of dedicated types of last-mile infrastructure is an indicator of the relevance for associated rail freight services in the respective European country;
- The development of these figures within the last years provides an impression on the expected relevance of the last-mile infrastructure types in the future. This development is of particular importance for the assessment of futures last-mile infrastructure needs;
- The performance of the analysis has illustrated the situation regarding data availability and quality for last-mile infrastructure.

Within this study, **all EU-28 countries have been considered, plus Norway and Switzerland, but without Cyprus and Malta, which do not show any rail freight service**. Thus, 28 countries have been included into the following overviews.

During this work step, numerous data sources have been used, analysed and evaluated. Summarising, the data availability and quality shows an ambivalent picture: on one hand, sufficient up-to date data on list-mile occurrence is available particularly for intermodal terminals. This is due to international organisations like UIRR, AGORA or SGKV collecting and providing terminal data of their members towards (potential) customers. On the other hand, such international databases do not exist for private or public sidings. Respective information - as far as available at all - is provided by infrastructure managers on national level, either directly via web sites and personnel contacts or via network statements. Moreover, these sources do not provide homogenous data structures: for instance, some figures only include loading tracks, whilst other values refer to all kinds of tracks in the respective station. In this context, the status of the infrastructure is mostly unknown as well: are the listed private/public sidings merely existing, is there a service contract or are they actually served on a regular basis? Such questions could often not be answered even by the interviewed infrastructure managers.

When evaluating the available figures, only up-to date (not older than 2013) data sources have been exploited. This is most important to receive a consistent picture, as the number of all last-mile infrastructure types showed a significant development during the last years in nearly all European countries:

- Private sidings: decrease;
- Stations with public sidings: decrease;
- Intermodal terminals: increase;
- Railports/conventional terminals: increase.

Concluding, **it must be stated that the availability of data particularly for private and public sidings is rather limited**. In order to provide a complete view on the situation in all incorporated countries, missing data on last-mile infrastructure occurrence had to be gathered by approximate calculations (see paragraphs below). When receiving further official data, these approximate values will be replaced subsequently. With respect to available data sources, it cannot be guaranteed that respective figures of the different countries are fully compatible and comparable. For these reasons, the following figures should be understood as an indication rather than as an exact value.

According to the described procedure, more than 22,100 access points to rail freight have been identified in the 28 European countries (compare Table 25). The vast majority (~ 15,600 = 70%) of this overall figure refers to private sidings, followed by public sidings (~ 5,600), intermodal terminals (730) and railports/rail logistic centres (~ 190). On average, each of the included European countries features almost 800 access points to rail freight.

Table 25 - Last mile infrastructure in Europe, last update: September 2015

Country	Private Sidings[71]	Stations with public sidings[72]	Intermodal terminals[73]	Railports[74]	All access points	Track length[75]	Private sidings per 1,000 km	Stations with public sidings per 1,000 km	Intermodal terminal per 1,000 km	Railports per 1,000 km	All access points per 1,000 km
Austria	716	107	21	7	**851**	5.566	129	19	4	1	**153**
Belgium	484	113	49	13	**659**	3.578	135	32	14	4	**184**
Bulgaria	331	250	5	2	**588**	4.070	81	61	1	0	**144**
Croatia	92	211	8	0	**311**	2.722	34	78	3	0	**114**
Czech Republic	1.242	244	21	3	**1.510**	9.570	130	25	2	0	**158**
Denmark	69	29	11	6	**115**	3.181	22	9	3	2	**36**
Estonia	379	127	8	0	**514**	1.196	317	106	7	0	**430**
Finland	172	224	17	0	**413**	5.944	29	38	3	0	**69**
France	1.500	332	72	6	**1.910**	29.273	51	11	2	0	**65**
Germany	2.395	475	154	32	**3.056**	41.427	58	11	4	1	**74**
Greece	17	99	3	2	**121**	2.552	7	39	1	1	**47**
Hungary	711	456	16	9	**1.192**	8.141	87	56	2	1	**146**
Ireland	5	2	6	0	**13**	1.931	3	1	3	0	**7**
Italy	762	199	46	11	**1.018**	16.742	46	12	3	1	**61**
Latvia	484	162	6	0	**652**	1.859	260	87	3	0	**351**
Lithuania	416	54	7	0	**477**	1.768	235	31	4	0	**270**

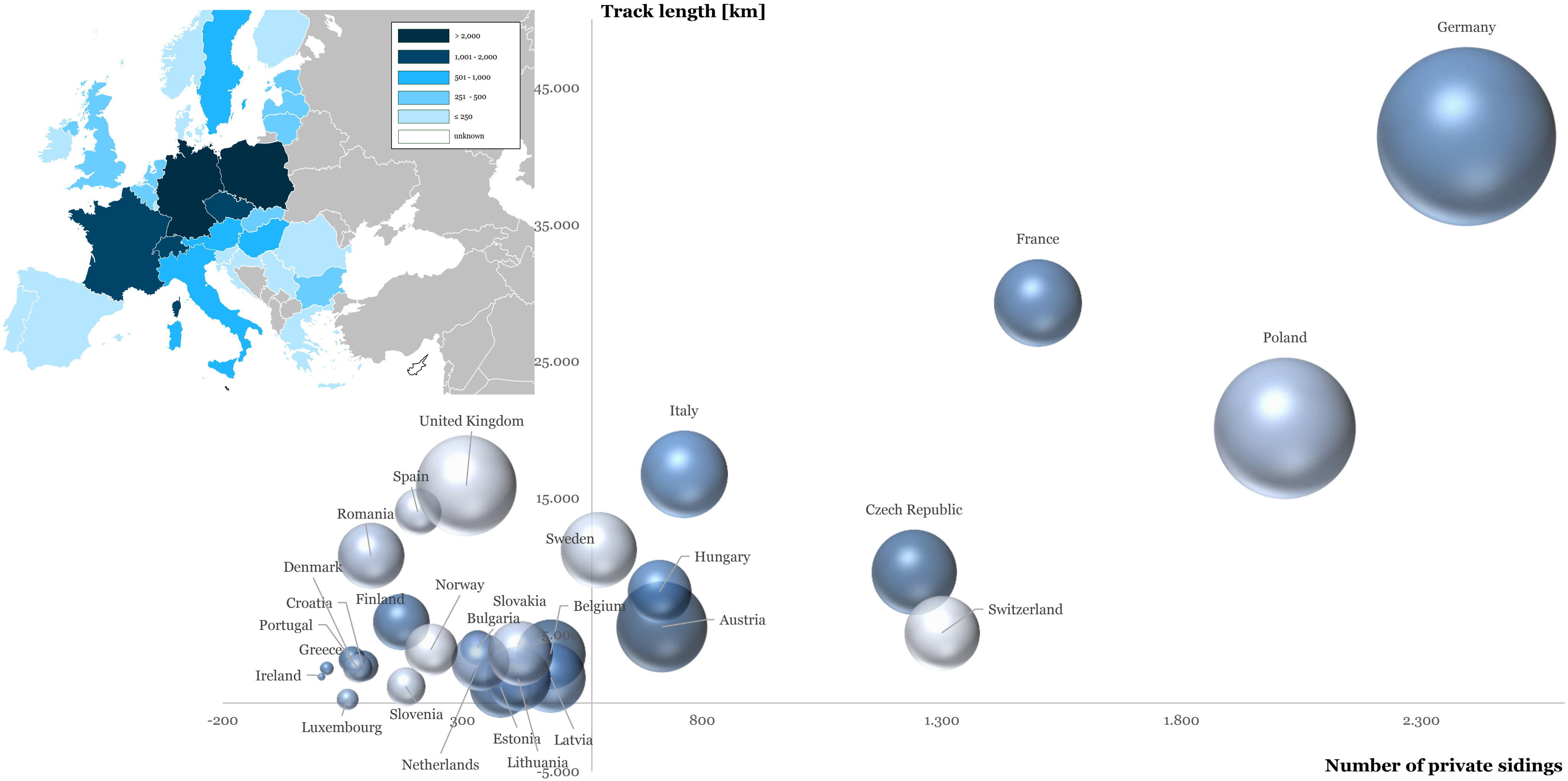
[71] Source: HaCon, based on German MoT, Networkrail, SNCF, OBB Infra, SZ, SBB, network statements, own estimations
[72] Source: HaCon, based on SBB Cargo, DB Schenker, Green Cargo, SZ, VDV, network statements, own estimations
[73] Source: HaCon, based on SGKV
[74] Source: HaCon, based on DB Schenker, RailScout, SZ, CP Carga
[75] Source: Eurostat

Country	Private Sidings[71]	Stations with public sidings[72]	Intermodal terminals[73]	Railports[74]	All access points	Track length[75]	Private sidings per 1,000 km	Stations with public sidings per 1,000 km	Intermodal terminal per 1,000 km	Railports per 1,000 km	All access points per 1,000 km
Luxembourg	60	15	3	0	**78**	275	218	55	11	0	**284**
Netherlands	337	10	27	41	**415**	3.013	112	3	9	14	**138**
Poland	2.016	414	35	11	**2.476**	20.094	100	21	2	1	**123**
Portugal	81	86	4	14	**185**	2.541	32	34	2	6	**73**
Romania	109	559	24	6	**698**	10.777	10	52	2	1	**65**
Slovakia	420	495	11	0	**926**	3.631	116	136	3	0	**255**
Slovenia	182	223	3	1	**409**	1.209	151	184	2	1	**338**
Spain	207	53	41	2	**303**	13.976	15	4	3	0	**22**
Sweden	584	180	34	12	**810**	11.206	52	16	3	1	**72**
United Kingdom	308	40	46	6	**400**	15.884	19	3	3	0	**25**
Norway	*234*	*50*	*19*	*2*	***305***	*3.891*	*60*	*13*	*5*	*1*	***78***
Switzerland	*1.300*	*401*	*33*	*3*	***1.737***	*5.124*	*254*	*78*	*6*	*1*	***339***
EU 28+2[76]	**15.613**	**5.610**	**730**	**189**	**22.142**	**231.141**	**68**	**24**	**3**	**1**	**96**
On average	***558***	***200***	***26***	***7***	***791***	***8.255***	***99***	***43***	***4***	***1***	***147***

More than 50% (~ 8,500) of all private sidings are allotted to the "top five" countries Germany + Poland + France + Switzerland + Czech Republic (see also Figure 25). Countries with particularly low occurrence of private sidings can be found primarily in South-West- and South-East-Europe. As indicated above, these values are of numerous origins, as a central database for such infrastructure does not exist. Moreover, for about half of all countries no figures on private sidings were available at all, or available figures were too old to be compared to the more recent ones of other countries. In order to cover these gaps, the missing values for private sidings were estimated according to the country specific share on the overall rail freight volume in Europe. In the following charts, the four types of last mile infrastructures are described in function of: Track length [Y axis]; Transport volume by rail [diameter scatter diagram]. The variable is represented by X axis on which the number of private sidings, stations with public sidings, intermodal terminals and railports is reported.

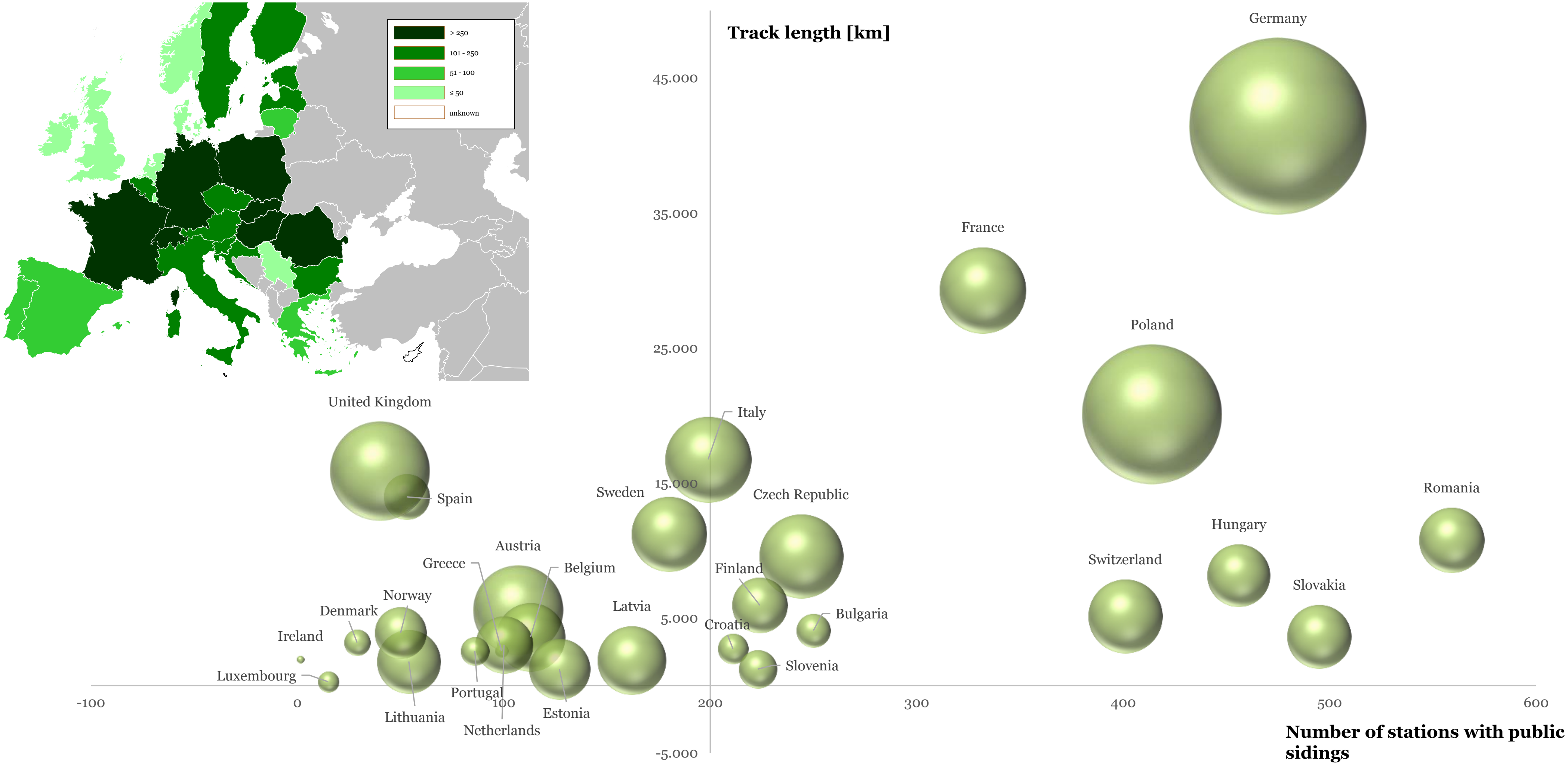
[76] Without Cyprus and Malta

Figure 26 - Private sidings – occurrence in Europe



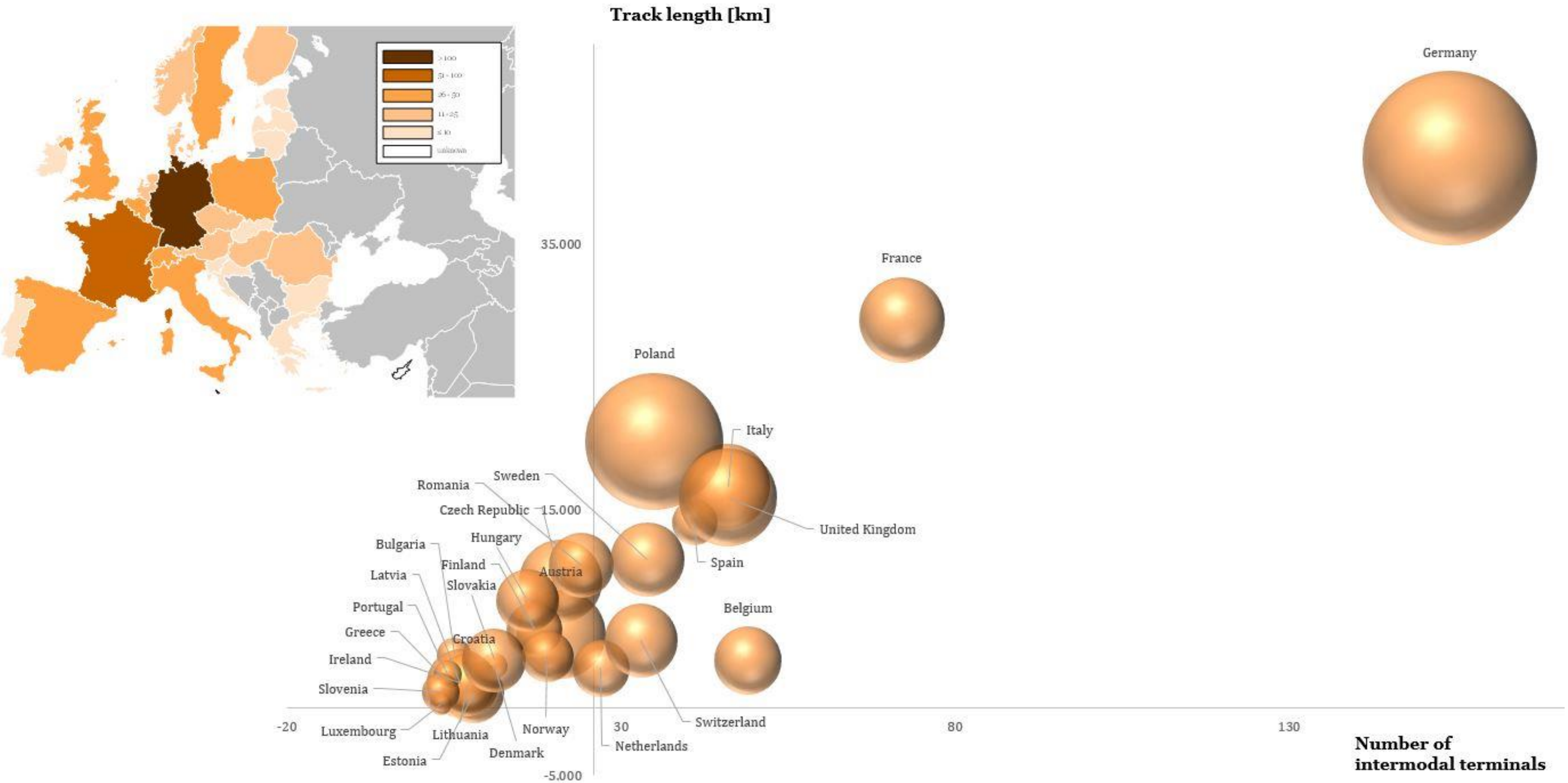
Sources: see Table 25

Figure 27 - Stations with public sidings – occurrence in Europe



Sources: see Table 25

Figure 28 - Intermodal terminals with rail access – occurrence in Europe



Sources: see Table 25

Figure 29 - Railports/conventional railroad terminals – occurrence in Europe

Sources: see Table 25

The density of access to private sidings refers the absolute figure to the length of the rail network in the respective country. With exception of Switzerland, this ranking is led by countries, in which the high density figures results from a small network rather than from a large number of access points (Baltic States, Luxembourg).

The occurrence of stations with public sidings (Figure 25) shows a slightly more balanced allocation to the European countries, but on a particular lower level. **Especially in Eastern and South-Eastern Europe public sidings are still widely spread**; obviously the structural change of reducing this kind of last-mile infrastructure, which has already taken place in many West-, South and Middle-European countries, is still ongoing here.

Again, numerous sources had to be exploited, mostly network statements of the (former) state railways; remaining data gaps were filled by approximation analogous to the private sidings procedure (see above). **As a result, about 5,600 stations with public accessible loading tracks currently have been detected, with a clear tendency of further decrease**. Most likely, the majority of these sidings merely exists, but is not regularly served any more.

In contrast to the private and public sidings, the information for intermodal terminals could be gathered from one single source: the “intermodal map” by SGKV is the currently most up-to-date, Europe wide database.

The statistic on occurrence sees Germany in front with some 150 terminals accessible by rail (compare Figure 26), followed by France, Belgium, Italy, UK and Spain. In total, all examined European countries showed at least one intermodal terminal, totally 730.

Railports or other conventional rail/road terminals could be detected in 20 (out of 28) countries, most of them associated to DB Schenker Rail and cooperation partners. Due to this, the majority of these terminals is allotted to central Europe, Italy and Sweden (see Figure 27). The total number is however small, compared to the other types of last-mile infrastructure; totally some 190 railports have been identified altogether.

4.2.2. Conclusions

Table 26 shows the summary of the last-mile infrastructure occurrence in Europe. In total, more than 22.000 access points to rail freight have been identified.

Table 26 - Occurrence and main logistic parameters of LMI types, last update: September 2015

	Private sidings	Stations with public sidings	Intermodal terminals	Railports/ conv. terminals
Number of sites in Europe (EU 28+2) Total: ca. 22.120	ca. 15,600	ca. 5,600	ca. 730	ca. 190
Trend for future development	↘	↓	↗	↑
Main rail freight markets	Single wagon/ wagon groups Block trains	Single wagon/ wagon groups	Intermodal trains	Single wagon/ wagon groups
Open to rail freight customers	Mostly no	Yes	Mostly yes	Yes
Restriction for commodities	Depending on owner	Generally no restrictions, actually only few dedicated commodities (e.g. wood)	Standardised loading units only	Generally no restrictions, actually affinity to dedicated commodities (e.g. steel, paper)

Source: HaCon

Nearly three quarters of all these access points refer to private sidings, followed by stations with public sidings, intermodal and conventional rail terminals. For the foreseeable future, it is expected that these figures will develop as follows (for detailed figures see also chapter 4.4):

- **The number of private sidings has been decreased significantly within last years (e.g. in Germany from about 13,000 in 1993 to 2,400 in 2013)**. In consequence, only sidings with high volume for block trains or at least strong wagon groups have survived and are still in operation. Many North-, West-, South- and Middle-European countries have shown a similar development, whereas in Eastern and South-Eastern Europe this process will reach its peak within the next years. For the future, a further consolidation process is expected: Large existing private sidings will be used more extensively than today, smaller facilities will be abandoned. In total, the number of private sidings in Europe will further decrease. **This decrease will only partially be balanced by new or revitalised facilities, due to national and international funding programmes or to relocation of industrial manufacturing towards (South) Eastern Europe**.
- Stations with public sidings are an anachronism nowadays. They are a relic of former times, when single wagon traffic used to be an area-wide transport system “for everybody”. Apart from dedicated niche markets or services provided by regional rail operators, they will disappear. Some of them will be replaced by railports.
- **Intermodal transport is the rail freight market segment with the highest expected growth rates**. Thus, many existing terminals will reach their capacity limits. This will demand either expansion of existing facilities or construction of additional ones. The trend towards industrialisation of intermodal transport will furthermore lead to a replacement of old terminals with complex infrastructure and processes by modern configurations. However, some countries already show intentions to limit the further increase of intermodal terminal in order to avoid “volume cannibalism”, e.g. by implementing respective check procedures in the funding schemes. In consequence, a moderate growth of the number of intermodal terminals is expected.
- **Railports/conventional terminals are designed to (partially) balance volume losses of single wagon transport**. Moreover, these facilities offer additional services like warehousing, storage etc., making them attractive for integration in dedicated logistic concepts (e.g. steel or paper industry). Their number is expected to rise strongly, especially in those countries that intend to give up single wagon transport. In total however, this will (by far) not equalise the number of abandoned private/public sidings.

4.3. Development of the rail and logistics market

4.3.1. Framework conditions of the freight market in Europe

The rail freight market had significantly changed in the past five decades. **In order to get a clearer understanding of the position of rail freight transport in Europe, this chapter briefly describes the current main framework conditions and challenges**. These have been determined mainly by the following factors:

External factors:

- **Liberalization of the European freight market**: since 1993, the market access in road transport has been gradually liberalized. This development took place with the release of cabotage without quantitative restrictions in July 1998. Hence, the European road transport companies can offer their services almost without any restrictions. In particular, road transport companies from Eastern European countries can offer their services at very competitive rates.
- **Changes of goods structure**: in the highly developed European economies, the transport volumes of consumer and production goods are growing. The share of mass and bulk goods, on the other hand, stagnates or even falls. Therefore, the distribution of goods shifts to high-quality products that must be transported quickly. Because of the relatively low costs, road transport generally benefits, whereas rail freight and inland waterway transports in general suffer because of their comparably long transport times. In particular, the booming internet business leads to a fragmentation of volumes in distribution logistics, which are less suitable for being moved by rail (small, fast and reliable shipments).
- **Logistics effect**: logistics systems are constantly subject to optimization processes. Supply chain management, production synchronized deliveries that employ just in time and just-in-sequence concepts with forgoing of storage and global outsourcing are just a few examples of this. The application of these logistics concepts affects the freight market regarding modal choice decisions. Particularly road transport is able to react flexibly to customers' requirements. Rail freight, and inland waterway transport as well, have difficulties to offer guaranteed arrival times and flexible capacities on short term demand.
- **Transparent transport chains**: Shippers and forwarders today demand for transparent chains and real-time tracking & tracing information. For road transport, adequate state-of-the-art telematics systems have been established. In this field, rail transport has a large pent-up demand. The rail industry as a whole is supposed to be unable to match the service level of road transport and therefore does not fully meet shippers' requirements.
- **Public awareness**: in the public opinion rail freight transport is located in a conflict area between an environmentally friendly transport mode and the role of an issuer of noise caused by train operation e.g. triggered through the wagon brakes. Hence, on hand big shippers advertise their use of rail freight, on the other hand citizens groups plead for the reduction of rail freight on specific corridors, e.g. along the Middle-Rhine area in Germany. The rising awareness of the population of railway noise and the decline of public acceptance of rail freight services will most likely oblige administrations to take actions against rail freight noise such as bans on night operations or speed limits.

Internal factors:

- **Intramodal competition**: Due to the above-described developments and trends rail, freight also faces an "intramodal" competition. Conventional rail transport (block trains and single wagonload) are competing with combined transport rail-road (e.g. in the chemical industry);
- **New market entrants**: through the liberalisation of the European freight market, new railway undertakings gained market shares from the incumbent railway undertakings. For instance in

Germany, the market share of these companies increased from 0.8% in 1994 to 37.4% in 2013, based on domestic tonne-kilometres[77];

- **Increasing internationalization of transport**: railway business still is dominated by national regulations and standards. Therefore, rail transport on international trade lanes often is "broken" at the border between two countries. Due to different electricity lines and train control systems, mostly a change of locomotives and drivers has to be performed. Locomotives equipped with multiple power systems are available. In addition, the deployment of rail lines and locomotives with a standardised European Rail Traffic Management System ERTMS offers the potential to solve these problems. But both need on the other side high investment costs and consequently noticeable higher operation costs affecting the competiveness of rail freight transport;
- **Long innovation cycles**: rail vehicles have in general a very long lifetime and thus do not suffer as much from depreciation as road vehicles. Consequently, rail equipment cannot be adapted under economic conditions on short notice to specific market needs;
- **Transhipment facilities**: operators/ users of private sidings have to carry the building of their own rail infrastructure. These costs have to be included in modal choice decisions. Therefore, in some European countries (e.g. Austria, Germany, and Switzerland) funding programmes for the building and renewal of private sidings have been established.

The above-described framework conditions show that rail freight operates in a conflict area of strong modal and intramodal competition. In particular, road transport is a strong competitor due to its high flexibility to react on market demands. In the past years, decreasing shipment sizes, the need for a deeper integration of transport services into complex logistics chains and growing customer's requirements for any time availability of transport information (tracking and tracing, estimated time of arrival etc.) had provided increasing market shares for road, especially at the expense of the single wagonload traffic. Consequently, following this development, transhipment volumes via private and public sidings for single wagonload have been decreasing.

"Winner" of the above described development is intermodal transport, which today plays a significant role in logistics chains e.g. in the automotive and chemical industry dues to its flexibility and lower hurdles for using this type of rail transport: available terminal net with a good coverage in many European countries (clients do not have to invest in transhipment infrastructure), use of standardised loading units and wagons. Most of the new market entrants are focusing on this market and often compete on price.

[77] Wettbewerbsbericht 2014, Deutsche Bahn AG, March 2014

4.3.2. Current rail freight market

The existing and future demand of last-mile rail infrastructure can be evaluated properly only in context to the overall freight market situation in Europe. As defined in chapter 4.2.1 the item "Europe" comprises EU-28 plus Norway and Switzerland.

With respect to the subject of this study, **the following analyses refer to the volume [t] and not to the transport performance [tkm], as the volume is the relevant unit for calculation of capacity (needs) of last-mile infrastructure facilities**. The respective figures were mainly gathered from the official Eurostat database. A comparison with national sources (such as DESTATIS for Germany) showed a general compliance, but also discrepancies and inconstancies in other cases. 2013 was chosen as reference year. In some few cases when there was no official Eurostat data for 2013, the most current Eurostat figures were taken into account.

4.3.2.1. Total overview on the European freight market

By applying the methodology described above, a picture of the freight transport markets can be deducted for each of the 30 countries involved (Table 27). The aggregation of these single markets sums up to some 17.2 billion tonnes (rail + road + inland waterway). It is however important to understand that this total figure does NOT represent the total EU-28+2 market as a whole, as it contains multiple counting for all volume flows amongst the 30 listed countries.

Table 27 - European transport volumes 2013 per country [1.000 t]

Country	Rail	Road	IWW	TOTAL
Austria	95.449	325.475	10.710	**431.634**
Belgium	55.876	300.608	187.404	**543.888**
Bulgaria	13.539	160.127	16.726	**190.392**
Croatia	10.661	67.512	5.823	**83.996**
Cyprus	n.a.	16.122	n.a.	**16.122**
Czech Republic	83.957	351.517	608	**436.082**
Denmark	7.956	173.917	n.a.	**181.873**
Estonia	43.682	31.080	n.a.	**74.762**
Finland	36.433	274.637	476	**311.546**
France	88.989	1.999.869	68.926	**2.157.784**
Germany	373.738	2.938.702	226.864	**3.539.304**
Greece	1.980	480.794	n.a.	**482.774**
Hungary	46.884	169.211	7.857	**223.952**
Ireland	589	107.222	n.a.	**107.811**
Italy	87.960	1.023.872	655	**1.112.487**
Latvia	55.831	60.610	n.a.	**116.441**
Lithuania	48.028	52.346	36	**100.410**
Luxembourg	5.098	51.480	8.987	**65.565**
Malta	n.a.	n.a.	n.a.	**n.a.**
Netherlands	38.927	604.692	356.062	**999.681**
Poland	232.596	1.300.608	3.185	**1.536.389**
Portugal	9.291	148.177	n.a.	**157.468**

Country	Rail	Road	IWW	TOTAL
Romania	50.348	191.544	26.858	**268.760**
Slovakia	48.401	129.032	8.107	**185.540**
Slovenia	17.156	65.340	n.a.	**82.496**
Spain	24.949	1.124.480	n.a.	**1.149.429**
Sweden	67.047	281.177	n.a.	**348.224**
United Kingdom	117.769	1.507.108	5.252	**1.630.129**
Norway	*31.429*	*271.349*	*n.a.*	***302.778***
Switzerland	*64.999*	*295.647*	*n.a.*	***360.646***
EU 28+2	**1.759.562**	**14.504.265**	**934.536**	**17.198.363**
Above average contribution				

Data source: Eurostat

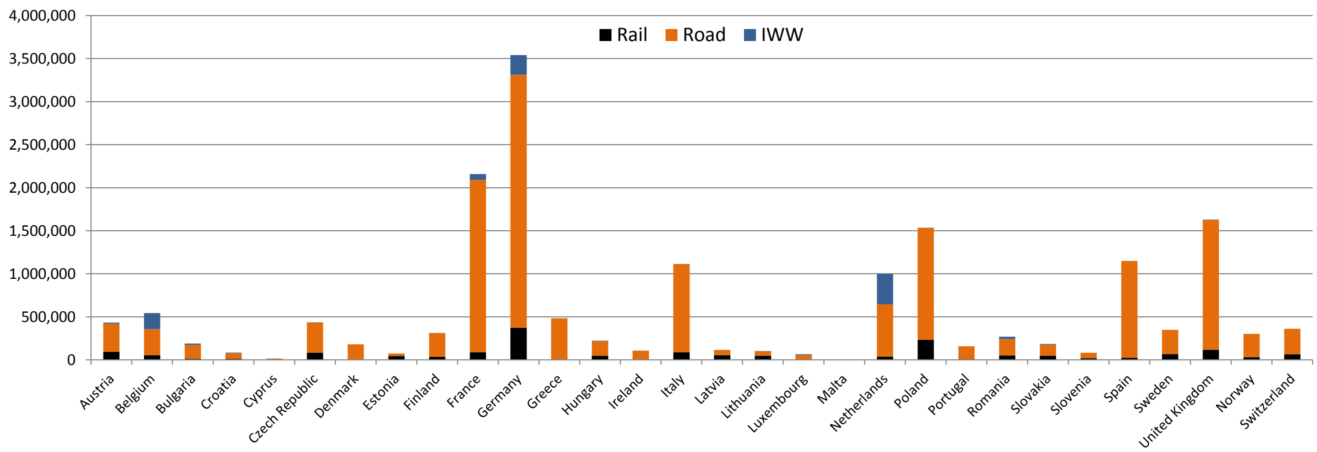
70% of the sum of all markets is represented by seven countries with above-average volume: France, Germany, Italy, the Netherlands, Poland, Spain and United Kingdom. At the same time, all these countries stand for the main contributors to the road volume as well, indicating the dominant position of road transport for the overall European freight market. Except for Spain and the Netherlands, **these countries also represent main contributors to the rail volume**, supplemented by countries with an above-average relevance of rail transport, particularly Austria, Czech Republic, Sweden and Switzerland. **Inland waterway transport in contrast is mainly allotted to only few countries: the Netherlands, Germany, Belgium and France**.

On the opposite side of the ranking, no freight volumes at all are published for Malta. Cyprus only shows road transport figures. Apart from these two countries, all other freight markets include at least two transport modes.

4.3.2.2. Modal-split

In total, road transport contributes by 14.5 billion tonnes to the aggregation of the European freight markets, representing a share of 84%, followed by rail (nearly 1.8 billion tonnes = 10%) and inland waterway (ca. 1 billion tonnes = 6%). As Figure 29 shows, this dominant position of road transport applies for almost all European countries, particularly for Denmark, France, Ireland, Greece, Italy, Portugal, Spain and United Kingdom, all showing an above 90% road transport share.

Figure 30 - Modal split – Total of all European freight markets 2013, based on [t]



Data source: Eurostat

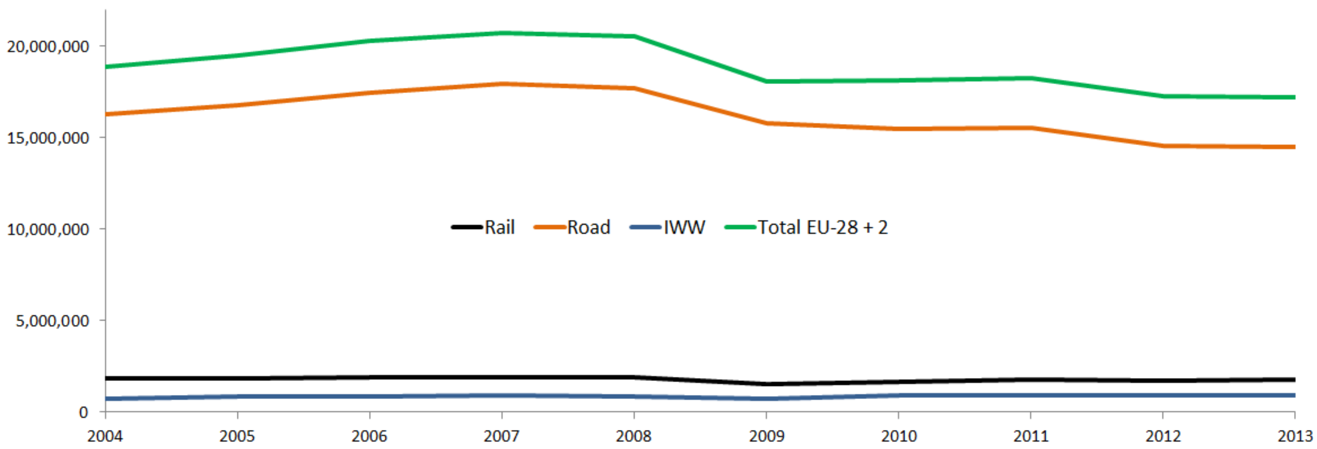
The range of absolute rail volumes is framed by Germany and Poland, standing for more than one-third of all rail markets, and Cyprus and Malta showing no freight volume at all. Looking at the country-wise modal shares of rail freight, extremely high values can be found in the Baltic States (about 50%), mainly due to the transport of mineral oil (products) and coal as well as the special trade connection of these countries with Russia. Besides, **many countries in Eastern Europe still show above-average rail shares of the overall volume**. This goes along with the considerable existence of last mile-infrastructure in these countries (especially stations with public sidings, compare chapter 4.2.1). Here, the structural change from rail to road transport is not yet on the same level as in Western Europe. In addition, Sweden, Austria and Switzerland show nameable rail shares, the latter ones due to the special political conditions in Switzerland and the particular relevance of alpine transit.

For 17 (out of the 30) analysed countries volume figures for inland waterway transport were published by Eurostat. The relevance of this mode is mainly restricted to the Netherlands, Germany and Belgium; these three countries represent more than 80% of the total of all investigated IWW markets. For the country-wise modal share, inland waterway transport generally plays a rather minor role; only the Netherlands, Belgium, Luxembourg and Romania have an IWW share of at least 10%.

4.3.2.3. Timeline of volume development

A look at the development of the European transport volumes shows that a period of permanent growth was terminated by the economic world crisis: from 2008 to 2009 the sum of all European freight markets dropped by 12%, rail and inland waterway even by 18%/17% (see Figure 30). After the crises, economic and in consequence transport volumes recovered slightly, mostly due to substantial growth of rail and inland waterway, whereas road volumes further decreased. **By status of 2013, inland waterway is the only transport mode to reach its pre-crisis level again**.

Figure 31 - Development of mode-specific transport volume [1000 t] in Europe 2004-2013



Data source: Eurostat

4.3.2.4. Main commodities

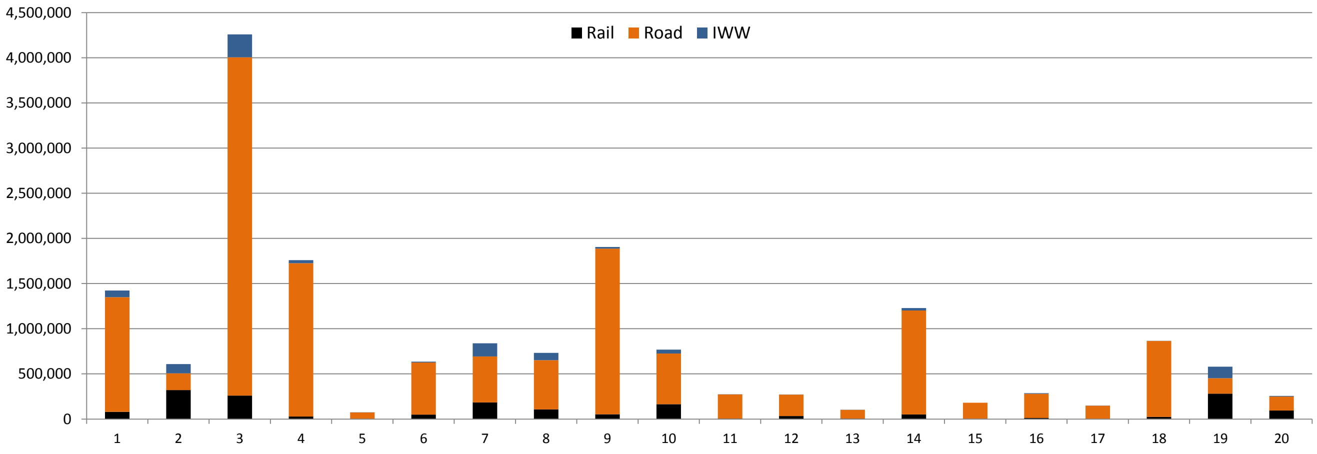
The analysis of commodities provides important conclusions about the mode-specific main markets. For this purpose, the official NST 2007 nomenclature has been used. A detailed explanation of the respective commodity code (GT01-GT20) can be found in the Table of Abbreviations. Figure 31 shows the commodity structure for all aggregated EU-28 + 2 freight markets as well as the respective modal share.

The five most transported commodities are (in descending order):

- Metal ores and other mining and quarrying products (GT03);
- Other non-metallic mineral products (GT09);
- Food products, beverages and tobacco (GT04);
- Products of agriculture and forestry (GT01);

- Secondary raw materials (GT14).

Figure 32 - Commodity structure by mode – Total of all European freight markets 2013 [1.000 t]



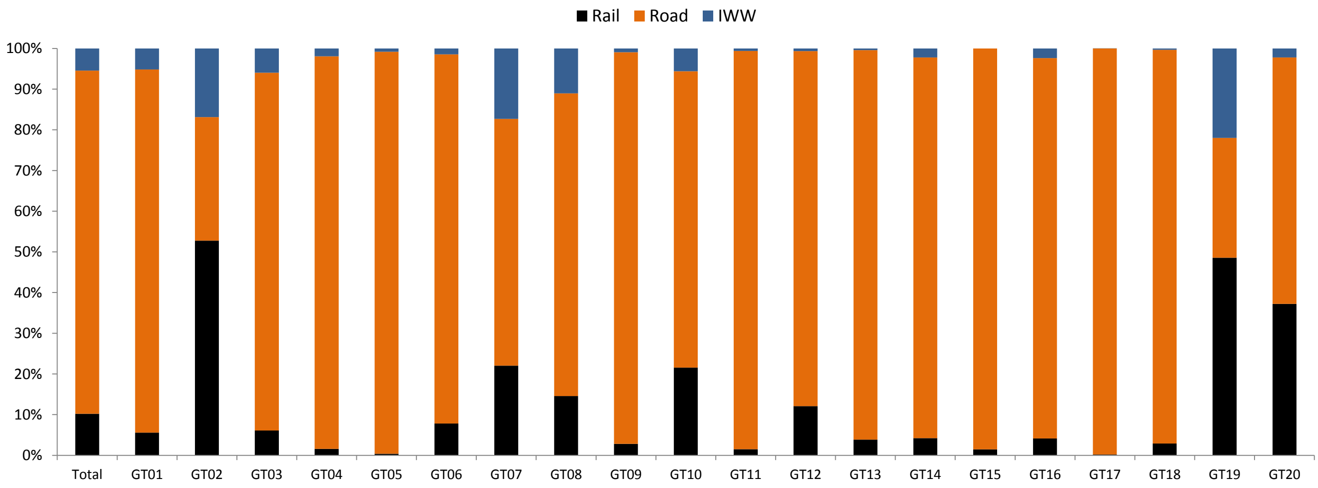
Data source: Eurostat

These five commodities account for more than 60% of all European transport markets. Commodities 03 and 09 (about 35% of all volumes) include the transport of building and construction material. **Germany contributes most to these two commodities with nearly 1.4 billion transported tonnes in 2013, followed by France (1 billion tonnes) and Poland (more than 600 million tonnes)**. However, these commodities play an important role in every country, the share ranges from about 20% (Baltic States) to 46% (Croatia, Romania).

The other "top five" commodities belong to food/agriculture products (GT01/04) and to "Secondary raw materials" (GT14) that include the transport of waste.

The five main cargo types have in common that road transport plays a dominant role. This also applies for almost all other commodities in almost all countries (see Figure 32).

Figure 33 - Modal-split by commodities – Total of all European freight markets 2013 [1.000 t]



Data source: Eurostat

Commodities with a high absolute and/or relative rail volume share are on one hand the "classical" rail freight markets: coal (GT02), coke/refinery products (GT07), chemical products (GT08), steel (GT10) and automotive (GT12). Coal and ores play a significant role in countries that exploit own deposits (e.g. Czech Republic, Bulgaria, Romania, Poland, United Kingdom, Sweden, Norway, Slovakia), but also for im-/export or transit transport (e.g. Estonia, Latvia, the Netherlands). Refinery products are most important for the rail freight markets in the Baltic States and Romania.

On the other hand, intermodal volumes (GT19) have taken over the leading role in many countries, particularly in Western, Central and Southern Europe (Austria, Belgium, Denmark, Germany, Italy, the Netherlands, Portugal, Slovenia, Spain, Switzerland).

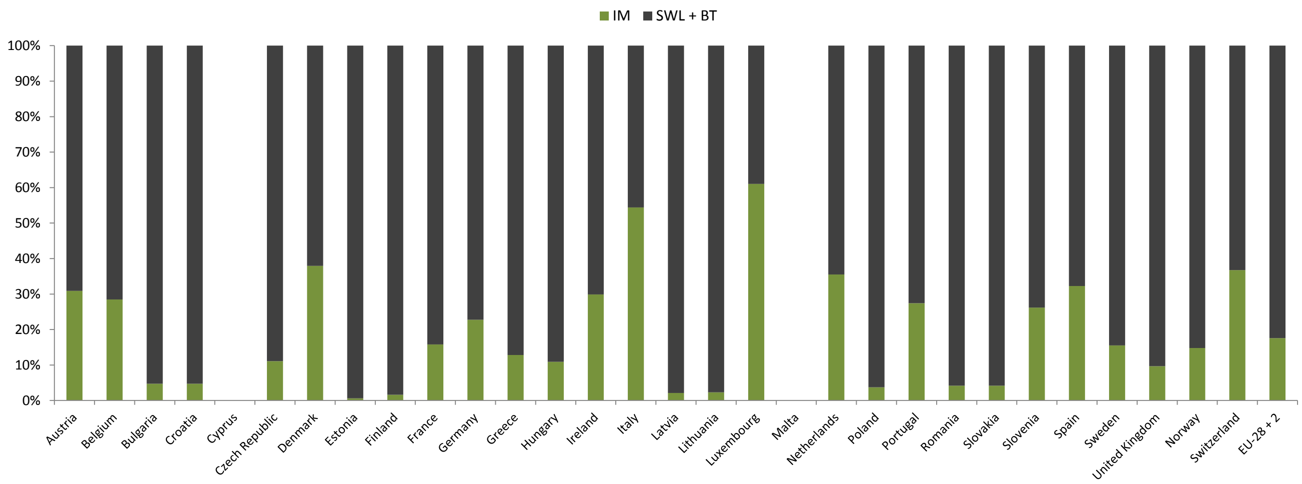
Altogether, the seven commodities mentioned above represent more than three-quarters of the aggregated rail freight markets in Europe.

In contrast to road and even more than rail, inland waterway volumes concentrate mainly on only few commodities and few destinations: between the ARA ports (Netherlands, Belgium) and Germany. Coal/ores (GT 02/03) and mineral oil/chemical products (GT 07/08) on these destinations represent more than half of the overall IWW volumes in Europe. Next to these cargo types, also container transport (GT19) along the River Rhine plays a significant role.

4.3.2.5. Rail freight intermodal / conventional markets

Another significant clustering of the rail freight volumes refers to the type of service/production system. In this respect, the Eurostat statistics allow for a dedicated view on intermodal transport. Thus, the conventional transport (i.e. single wagonload + block trains) was calculated as the difference between the total rail volume and the intermodal volume per country. Figure 33 shows the respective country share regarding the type of production scheme.

Figure 34 - Conventional and intermodal European rail freight market 2013, based on [t/a]



Data source: Eurostat

Within the decade from 2004 to 2013, intermodal transport volumes increased by 26% for the aggregation of all European markets. However, a view on the single countries shows a heterogeneous picture: on one hand Germany, Italy, Austria, Poland, the Netherlands, the Czech Republic and Sweden showed high absolute and relative growth rates. On the other hand, ten (out of 28) countries have lost intermodal volume during this time, particularly UK, France, Finland and Romania.

In total of all single countries, the contribution of intermodal transport to the overall rail freight volume increased from 14% (in 2004) to 18% (in 2013). The reasons for this growth are different; they comprise e.g.

- Rising maritime transports and this connected hinterland transports (e.g. Netherlands, Belgium, Germany);
- Special political conditions (Switzerland);
- Relevance of alpine transit (Austria, Switzerland, Italy, Germany);
- Abandoning of single wagon transport (Denmark, Italy, Portugal, Spain);
- Low absolute figures of rail transport and hence high percentage values even for small intermodal volumes (Ireland);

- Obvious data errors in Eurostat statistics (e.g. Luxembourg).

In contrast, under-average contribution figures of intermodal volumes can be found in countries with still high importance on conventional rail transports, particularly in (South) Eastern Europe and in the Baltic States.

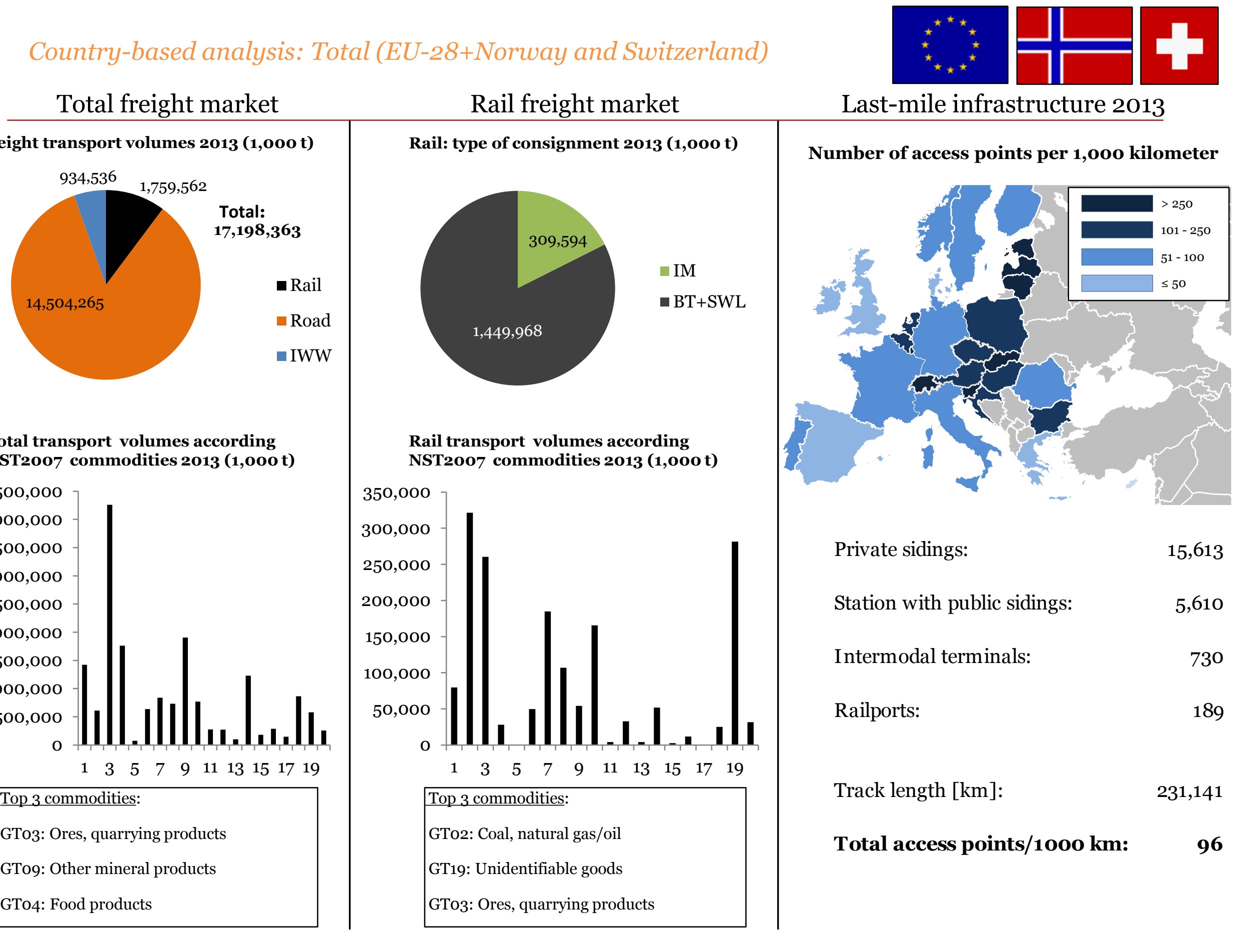
4.3.2.6. Summary of main results

In order to get a comprehensive and clear overview, **"country charts" have been carried out, taking into account main indicators for the freight markets of the respective country**. Thus, each country chart is partitioned into three parts:

- The first chart gives an overview of the total freight market (total volume 2013, modal-split, commodities);
- The second part depicts the rail freight market (conventional/intermodal transport, commodities);
- The third part finally provides an overview on the present occurrence of last-mile infrastructure.

An example of the country charts is displayed below (Figure 34). The entire compilation of country charts can be found in Annex H.

Figure 35 - Example of country charts



Source: HaCon

4.3.3. Main framework conditions for last-mile infrastructure development

4.3.3.1. Megatrends affecting requirements on last-mile infrastructure

Megatrends are economic, logistical changes and social-political future developments, determining the future development of the freight market influencing significantly transport volumes, trade lanes and modal split. **In this chapter, important drivers for the development of the European rail freight market until 2030 are described**. A quantification of their degree of impact on freight volumes will not be executed due to the fact this will differ country-wise. Instead, the most likely consequences on involved industries with a high affinity to rail freight will be estimated. This in particular refers to the steel and energy market, because for these sectors structural developments are expected. For other relevant branches like chemical, automotive, paper and wood, no significant changes of production structures until 2030 are assumed. The outcome of these analyses will affect the the identification of key industrial clusters for rail freight (chapter 4.3.3.4) and the assessment of investment needs (cp. Chapter 4.4 and 4.5).

4.3.3.1.1. Globalisation

Globalization characterises the international division of labour in industry and the development of new regional markets. The internationalisation of the transport sector is a consequence of this development. It proceeds since many years, so that in most areas there is already worldwide networking.

According the estimations of experts in freight market, **the trend towards globalisation and the international division of labour in the long term will remain unbroken**. As an effect, the transport intensive creation of added value is increasingly leaving in particular the Western European countries and the co-called "extended workbenches" on the one hand shifted over to Eastern European countries, wider east e.g. to Russia and on the other hand to Asia, Africa and partly to South America.

A prominent example for this development is the expansion of car production plants. After the opening of the “Iron fence”, European and Asian car producers built new factories in e.g. Slovakia, Poland, Hungary, Romania and Russia for the feeding of the local and European market. Often their suppliers have followed with own production plants, mostly located near the OEMs. The same applies for other factories worldwide, particularly in prospering countries like e.g. China and India. For the freight volumes of the automotive industry in Europe, this trend has the following impacts:

- Declining volumes of finished cars transported by rail between to the seaports;
- Declining transport volumes in the for steel production (ore and coal) and steel products (steel plates and coils);
- Increasing transport volumes in intermodal transport (e.g. for CKD and SKD).

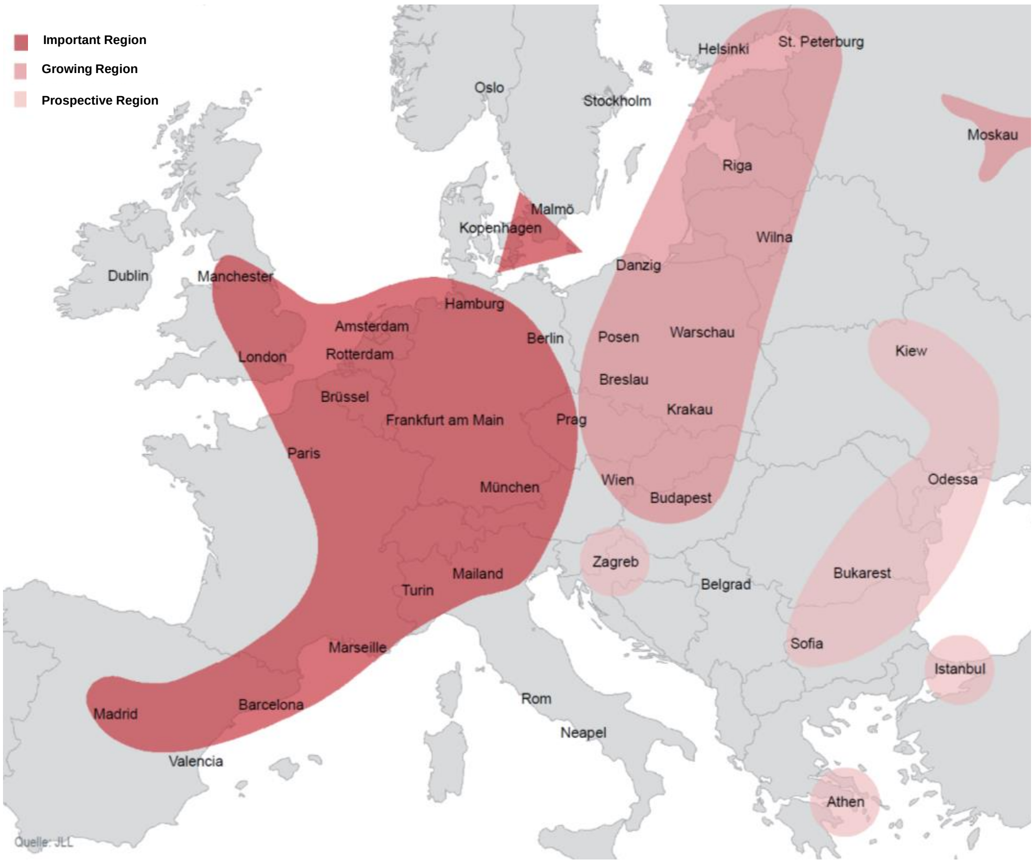
Another important aspect is the further expansion of the worldwide container traffic. This in particular has an impact on the transport volumes in the European seaports that are expecting significantly increasing container transhipment volumes. **Currently, the main transport volumes are carried out in the ports of Rotterdam, Hamburg, Antwerp and Bremerhaven**. For the future, these ports are expected to defend their leading position. For instance, the port of Rotterdam forecasts a CAGR of almost 4,2% for container hinterland traffic at the Maasvlakte in the period to 2035 whilst the Hamburg Port Authority foresees an increase of 7,5% pa until the year 2025. It is also expected that the Mediterranean ports are increasing their market share in Europe in the future. Altogether, this will lead to significantly rising transport volumes for intermodal transport connecting the seaports with their hinterland. Additionally, the share of containerised freight will grow. An example is the transport of fruits and vegetables. In the past, this was the domain of a fleet of high-specialized reefer vessels. These ships are constantly losing market shares in favour to container vessels.

Based on the study “Analysis of the EU Combined transport”, published in 2015, which provides a comprehensive insight into the current economic and legal state of intermodal transport operations in Europe, the forecasted intermodal volumes will increase in a range between +65% and +180% by 2030, depending on the chosen scenario.

Together with the globalization and the increasing involvement of the Member States located in Eastern Europe into the international freight flows, also a realignment of regions with a concentration of logistical functions can be determined. The traditional European area with a high concentration of production, trading and consuming activities needing a well performing logistics industry is concentrated along the following axis (cp. Figure 35):

- The London and Manchester region in Great Britain;
- The Brussels and Antwerp region in Belgium;
- The Randstad region in the Netherlands;
- Western Denmark (Copenhagen-region) and the Malmö region in Sweden;
- Germany in particular with the Rhine-Ruhr and Rhine-Neckar region,
- The regions of Paris, Lyon and Marseille in France;
- The Basel and Zurich region in Switzerland;
- Northern Italy and the
- Area between Northern Italy and Spain (Madrid and Barcelona region).

Figure 36 - Logistics regions in Europe



Source: Zukunftsbild Transport und Logistik 2030, Jones Lang Lasalle GmbH 2013

As mentioned above, all these regions have been well developed regarding their integration in national and international freight flows and their access to all transport modes. **Together with the already described shift of production to Eastern European countries, their importance for logistics is still increasing**. Regions already established or of growing importance in Europa are the Baltic States, Poland, the

Czech Republic, Slovak Republic, Hungary and the Moscow region. Countries supposed to be growing in the future are Belarus, Bulgaria and Romania - all located at the west coast of the Black Sea.

4.3.3.1.2. European Corridors

The European Commission supports the development of important transport axes through Europe. These are the TEN-T Core Network Corridors and the Rail Freight Corridors including the implementation of ERTMS. The general target is the dismantling of an efficient infrastructure enabling smooth international transport chains for both freight and passengers for all modes also supporting modal shift in particular from road to rail and inland waterway, if applicable.

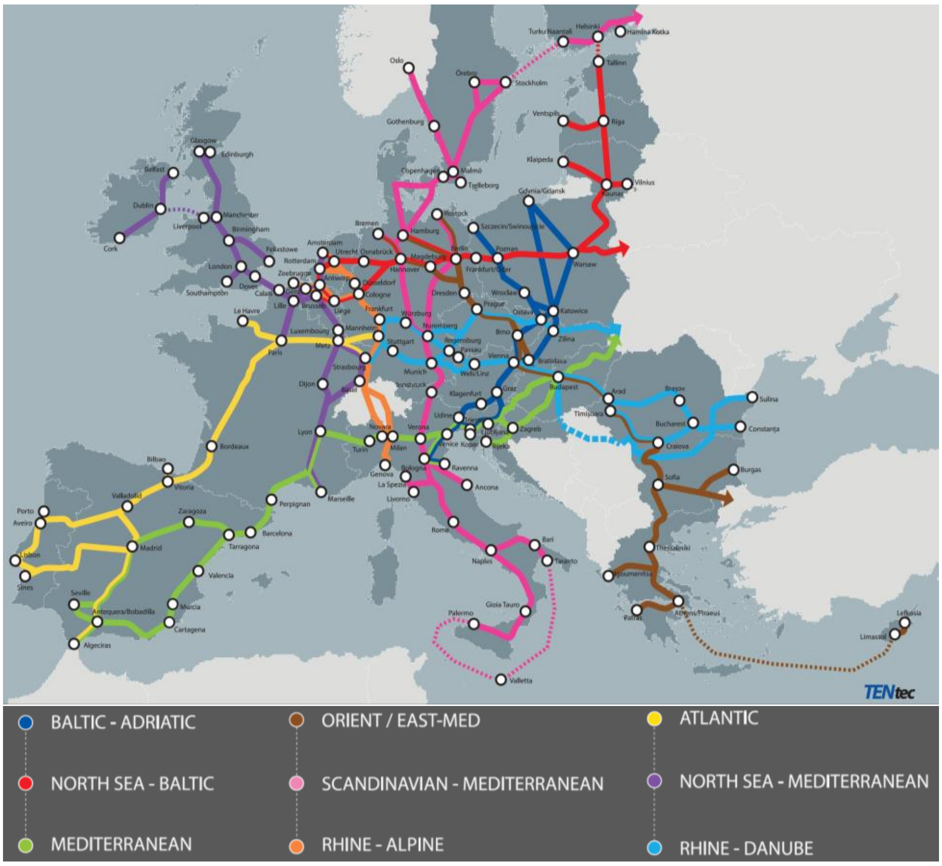
TEN-T Core Network Corridors

The European Commission develops the TEN-T Core Network together with the Member States until 2030. Additionally, the comprehensive network shall be realized until 2050. The Core Network Corridors were introduced in order to facilitate the coordinated implementation of the infrastructure network in order to:

- Remove technical and physical infrastructure bottlenecks;
- Improve cross-border connections for international transport;
- Promote modal integration and interoperability.

Within the Core Network, special attention is given to nine Core Network Corridors (see Figure 36), which are the implementation tool of the TEN-T guidelines (EU-Regulations No 1315/2013 and 1316/2013).

Figure 37 - Trans European Core Network Corridors



Source: European Commission

Core Network Corridors shall enable Member States to achieve a coordinated and synchronized approach with regard to investments in infrastructure in order to manage capacities in the most efficient way. For the development of the corridors, a specific work plan has been elaborated in 2014 and will be updated regularly in the following years. This work plan sets the framework for the development of the transport infrastructure, allowing the seamless functioning of all modes and multimodal transport chains, for both passenger and freight transport. The improvement of the framework infrastructure conditions of international rail freight service are a clearly defined focus of project activities.

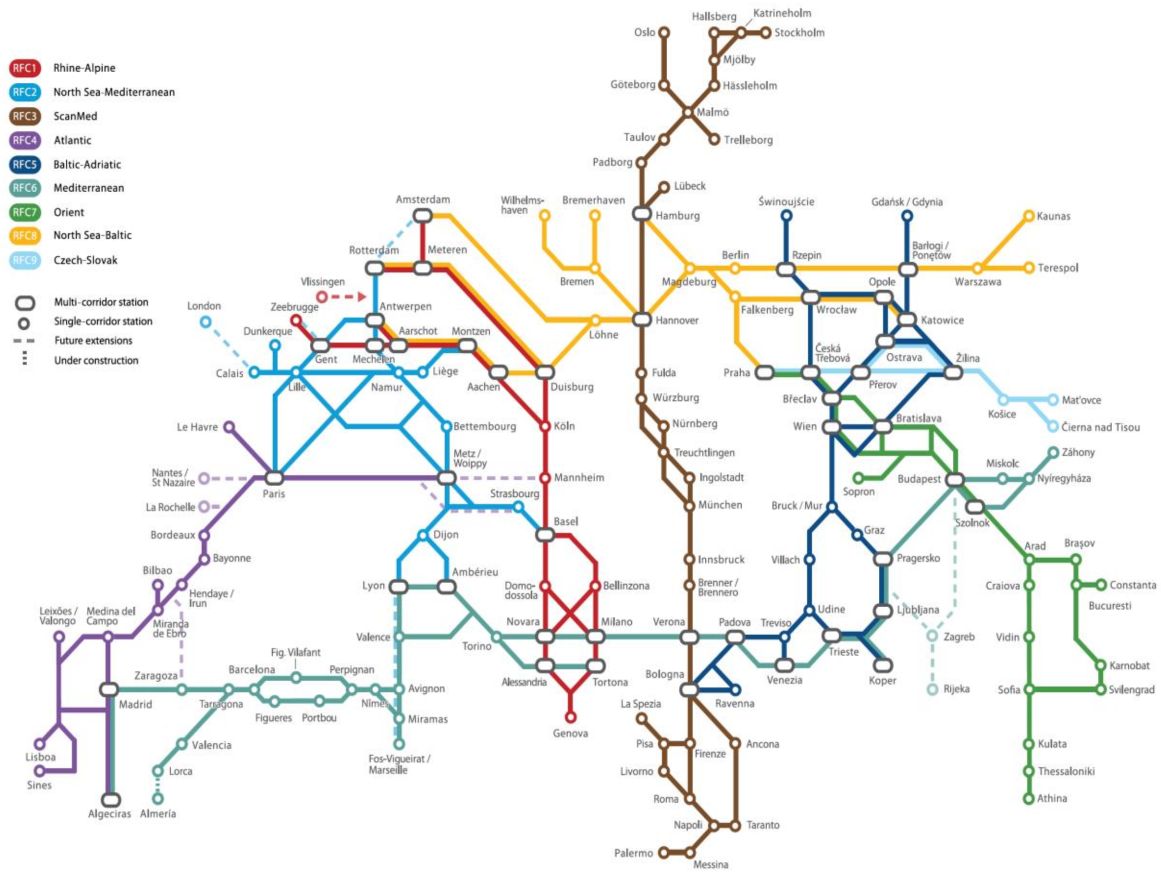
Rail Freight Corridors

Rail Freight Corridors (RFC) have been identified based on the EU regulation 913/2010 with the overall purpose of increasing international attractiveness and efficiency of rail freight, so that this mode can increase its competitiveness and market share on the European transport market. In order to achieve this, the regulation 913/2010 has the general objective of improving the conditions for international rail freight by reinforcing cooperation at all levels – and especially among the rail infrastructure managers along selected Rail Freight Corridors in order to

- Strengthen co-operation between infrastructure managers on key aspects such as allocation of path, deployment of interoperable systems and infrastructure development;
- Strike the right balance between freight and passenger traffic along the Rail Freight Corridors, giving adequate capacity and priority for freight in line with market needs and ensuring that common punctuality targets for freight trains are met;
- Promote intermodality between rail and other transport modes by integrating terminals into the corridor management and development;
- Support the coordinated implementation of the European Rail Traffic Management System (ERTMS);
- Compose a European-wide network for competitive rail freight.

An overview on the nine European Rail Freight Corridors (map 2015 including extensions expected in 2016 as indicated by the RFCs) is pictured in Figure 37:

Figure 38 - European Rail Freight Corridors



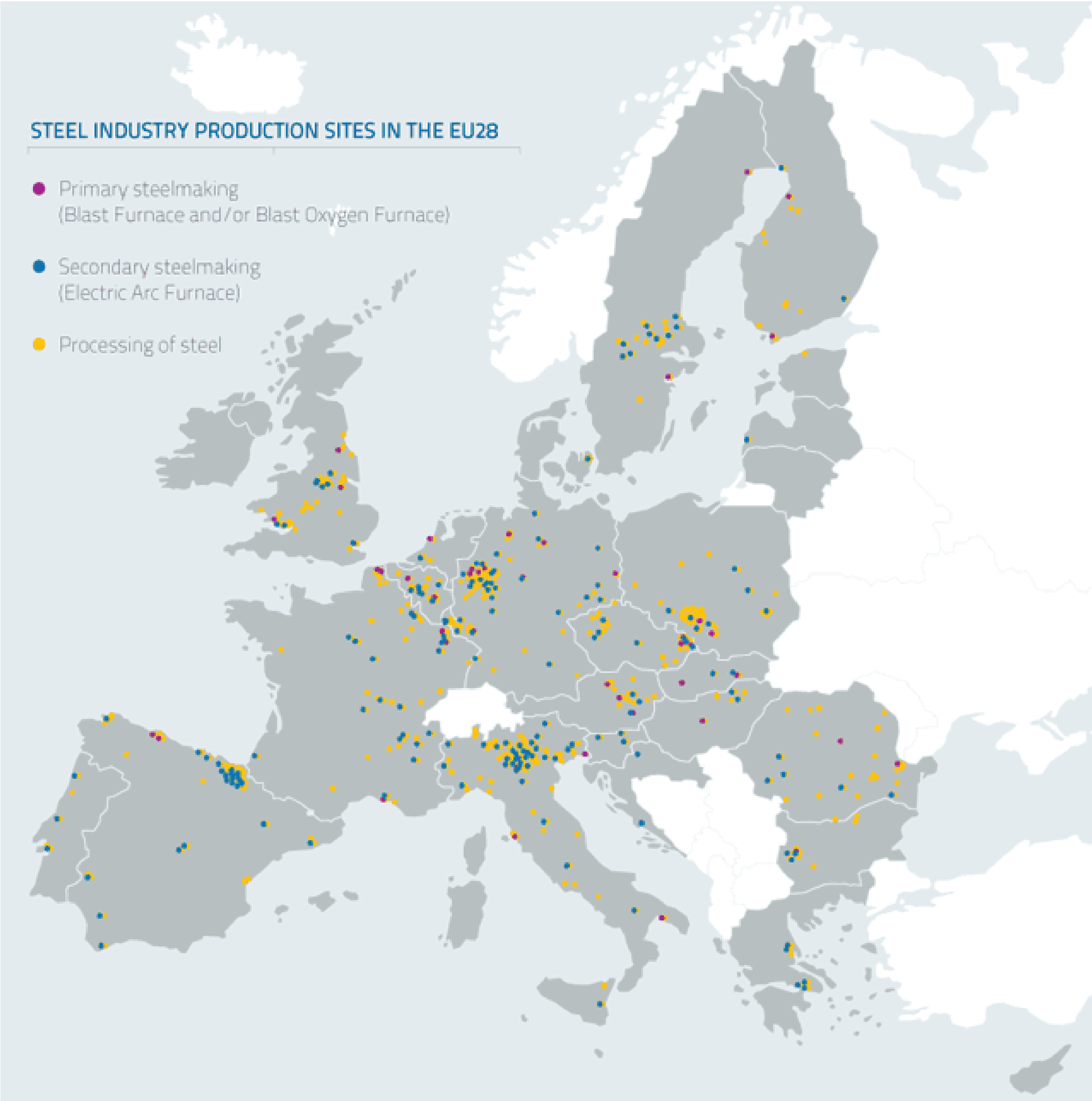
Source: www.rne.eu/tl_files/RNE_Upload/Corridor/RFCs/RNE_RFC_Overview_Map_print.pdf

4.3.3.1.3. Steel market

The European countries altogether are after China the second largest producers of steel. Their output is over 177 million tonnes of steel a year, accounting for 14% of global output. The steel industry has long held a strategic position in the EU economy, fostering innovation, growth, and employment. Steel is closely linked to numerous industrial sectors such as automotive, construction, electronics, or renewable energies, it is vital to the EU's goal to increase industry's share of GDP to 20% by 2020.

Figure 38 provides an overview on the European primary steel making plant. Most of the steel in Europe is produced via two basic procedures: The blast furnace route and the electric arc furnace route. Blast furnaces produce iron from iron ore. In a second step, a basic oxygen converter turns iron, with some additions of scrap, into steel. Electric Arc Furnaces produce steel mostly from scrap collected for recycling.

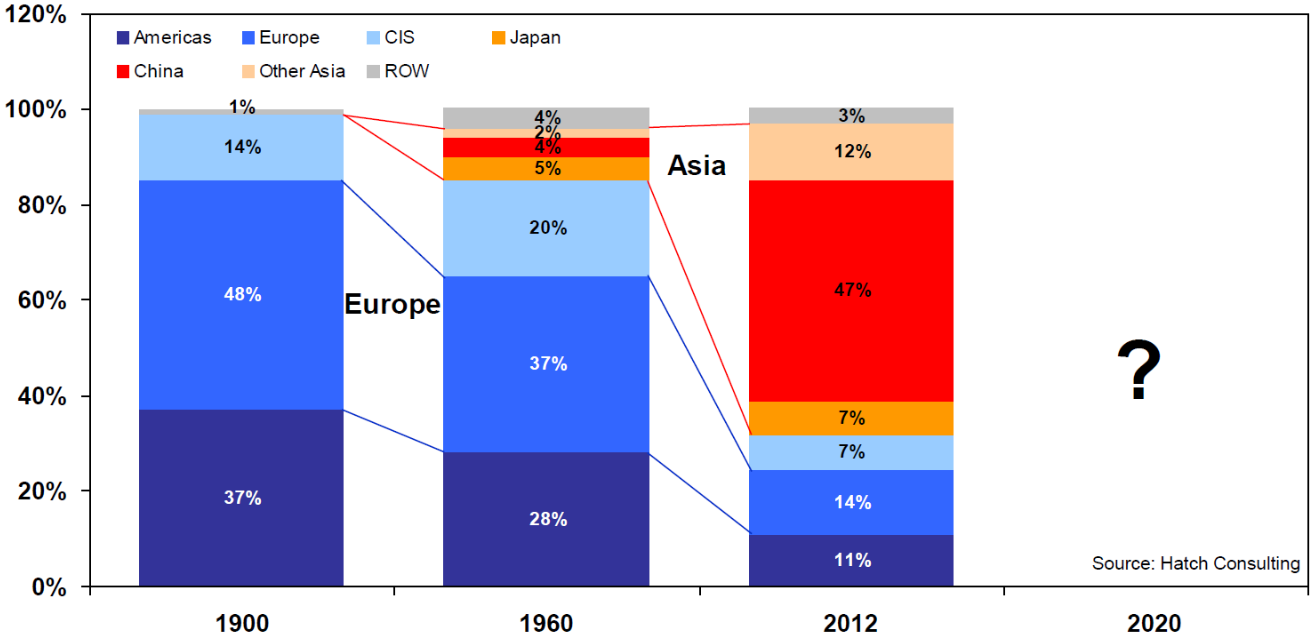
Figure 39 - Steel industry production sites in Europe (EU28)



Source: www.eurofer.org/About%20Steel/EuropeanSteelMap.fhtml

Over the past three decades, the EU steel industry was facing challenging times: growth has shifted to other parts of the world, demand has fallen to a new, structurally lower level, raw materials costs remain high, at least for now, and the industry is facing overcapacity. Figure 39 summarises the decline of the market shares of the Europe-based steel producers.

Figure 40 - Steel output share by country/region in Mio tonnes



Source: www.steelconsult.com/images/Presentation%20SteelConsult%20Platts%20Steel%20EUR.pdf

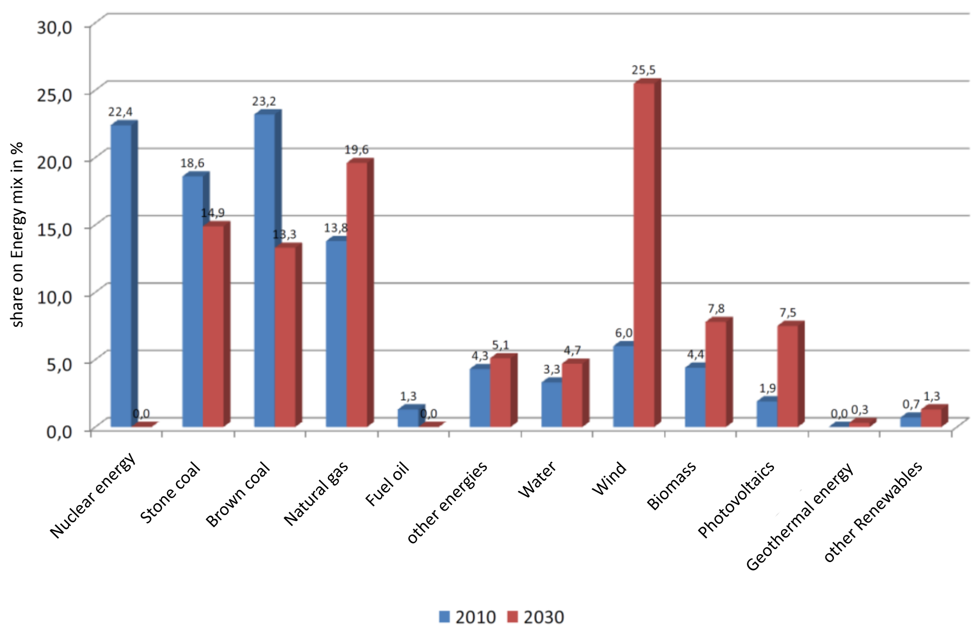
It clearly visible that the role of the European located steel mills is constantly declining. Experts estimate that the EU will remain a major market in volume terms with a high share of value added demanding business. Quality, lead times, freight costs, service, delivery reliability, and price risk all favour locally produced steel – but the production will inevitably decline further over the long term. The main markets for European steel mills are high value added steel products. They built a robust case for importing the raw materials and producing steel in Europe, rather than shipping large volumes of semi-products from other parts of the world.

The only region that has a potential role to serve as a steel supply base to Europe is the CIS. China is not sufficiently competitive to become a major exporter of steel on a structural basis. However, European mills may still on occasion be hit by temporary exports of excess steel from China. Any small imbalance in China will lead to large transport volume influencing the global market.

4.3.3.1.4. Energy market

In Europe, the energy market is changing predominately in order to reduce CO2 emissions. Therefore, the share of fossil fuels like coal lignite and hard coal for the generation of electric energy shall be reduced in favour to renewable energy sources like wind energy produced in onshore and offshores plants. According a decision taken 2011 in Germany, the number of nuclear power plants shall be consequently reduced. The last plants shall be closed latest by 2022. The estimated changes of the different energy sources like coal, oil, natural gases, wind, photovoltaic etc. for the generation of electricity in Germany between 2010 and 2030 is shown in Figure 40.

Figure 41 - Assumed changes the energy mix in power generation in Germany 2010-2030



Source: „Verkehrsverflechtungsprognose 2030 sowie Netzumlegung auf die Verkehrsträger"– Erstellung einer regionalisierten Strukturdatenprognose im Auftrag des BMVS, Final report December 2012

The consequences of the envisaged changes in the energy market until 2030, 2040 and 2050 are shown in Table 22. Up to 2030, in particular hard coal and lignite will retain their importance for the generation of electric power. The decreasing significance of natural gas, heating oil, and the completely closure of atomic power stations will be compensated particularly by wind energy. The generation from lignite power plants is due to the comparatively high efficiencies, lower fuel costs, and high efficiencies of modern plant able to maintain in long term the energy market. The generation of electricity from coal power plants is reduced by 2020. The shutdown of the last nuclear power plants in 2022 remains the electricity produced from coal at a constant level by 2030, then it will be more than halved until 2050 compared to 2011.

Table 28 - Gross energy generation in Germany (reference forecast and trend scenario)

Gross energy generation [TWh]	Reference forecast				Trend scenario	
	2011	2020	2025	2030	2040	2050
Stone coal	112	106	101	109	57	52
Brown coal	150	156	143	140	104	31
Natural gas	83	47	61	64	97	106
Fuel Oil	7	1	1	1	2	2
Nuclear energy	108	63	0	0	0	0
Store	6	5	5	1	0	7
Water energy and reservoirs	18	19	19	19	19	19
Wind energy	49	100	124	143	150	209
Onshore	48	83	90	107	112	136
Offshore	1	17	35	36	39	73
Photovoltaics	20	56	61	67	72	73

Gross energy generation [TWh]	Reference forecast				Trend scenario	
	2011	2020	2025	2030	2040	2050
Biomass	33	52	53	52	50	48
Other energy sources	25	14	15	15	15	14
Total	**609**	**619**	**582**	**612**	**565**	**561**
Export balance [TWh]	6	41	18	53	19	7
Gross electricity consumption [TWh]	603	578	564	559	546	554
Gross electricity generation from renewable energies [TWh]	124	234	265	289	299	356
Share of renewable energies on gross electricity consumption [%]	21%	41%	47%	52%	55%	64%

Source: Entwicklung der Energiemärkte – Energiereferenzprognose – Studie im Auftrag des Bundesministerium für Wirtschaft und Technologie, June 2014, translation by HaCon

The description summarises trends and foreseeable developments affecting the structure and the medium to long-term development of the rail freight market. This summary does not claim to be complete, but has identified the most important on European level with a high relevance for the framework of this study in particular regarding the assessment of rail transport volumes by 2030.

After the opening of the "Iron fence", in the Eastern European countries economic structures had changed significantly. The existing industries could not operate on a competitive basis. Consequently, transport volumes particularly for rail declined significantly. This went hand in hand with the increase of the modal share for road. Since *the* late 80th, a restructuring process began. Large investments had been made to build modern production plants, warehouses and an efficient modernised traffic infrastructure.

Until the fundamental political changes, the backbone of the transport system in Eastern Europe was provided by rail freight that had and still has a dense net of public and private sidings. Today, with the increasing economic importance of Eastern Europe in international trade and logistics networks, rail freight industry has good prospects to regain larger market shares in Eastern Europe. This development will be supported by the implementation of the European Core Network Corridors, promoting the extension and modernisation of traffic infrastructure and operation especially for international trade lanes, and the European Rail Freight Corridors, promoting smooth interoperable transport.

The country analysis in chapter 4.3.2 has shown that important rail freight commodities (ore, coal, steel) are connected to the steel production and energy generation. Steel production in Europe was constantly declining in the past decades. This process will continue for mass steel products, but experts estimate that the European producers will remain with significant market shares for high value added steel products.

For the generation of energy, the share of fossil fuels like coal shall be reduced in favour to renewable energy sources like wind energy. This transition process will take a long transition period. In Germany, a country that has a leading role in the substitution of fossil fuels, significant effects on transport volumes will be recognised at the earliest after 2030.

4.3.3.2. Development of rail production systems

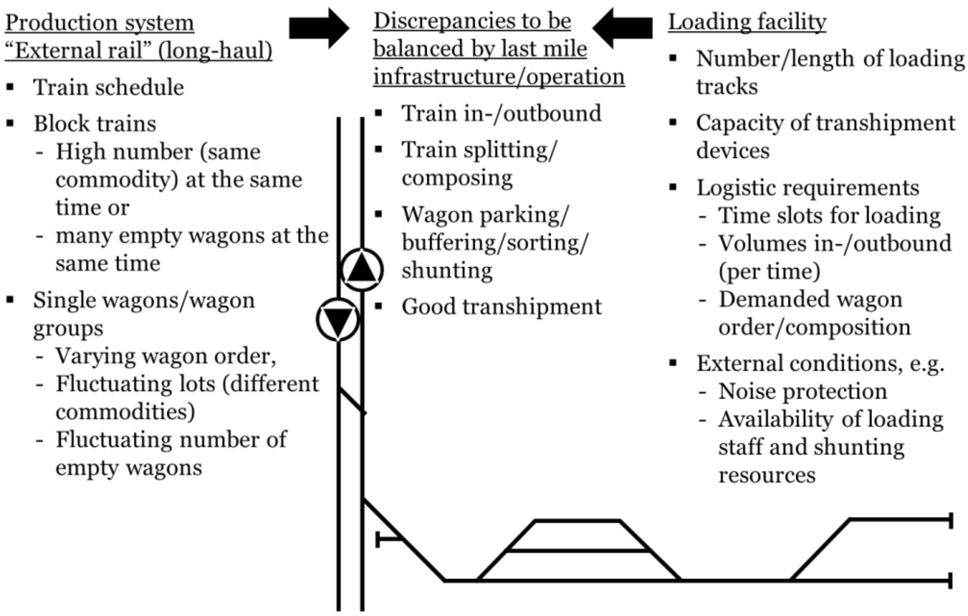
4.3.3.2.1. Relevance of rail production for last-mile infrastructure

The term "rail production" compiles all operational activities, which are needed to compose and to run trains. It is thus evident that the way companies produce their rail freight services has an influence on the requirements on last-mile infrastructure. As Figure 40 shows, these influences are determined on one hand by the long-haul production system (in simple terms differentiated in single wagons/wagon groups, block trains and intermodal trains). All operation forms have specific characteristics: block trains demand the coping with high volumes in the loading facility at the same time, while the challenge of single wagons transport is mainly due to its variation (wagon order, different commodities in one set and a fluctuating number of empty wagons). Whichever long-haul production system is in use, they all have in common that they are based on a schedule that has been set due to multiple framework conditions – the requirements of the last mile might be (only) one of them, in many cases however last-mile only plays a minor role.

The loading facilities as the ultimate origin/destination of rail freight are characterised by locally available infrastructure (e.g. loading tracks/facilities with their respective capacities) and logistic requirements that are mainly due to product manufacturing, but not to railway service. This particularly applies for private sidings. These logistic framework conditions might request dedicated time slots for loading/unloading activities, selected wagon types and/or orders, special staff and shunting resources and many other items.

Concluding, **last-mile infrastructure and operation must balance framework conditions set by the railway operators on one side and by the product manufactures on the other side** (see Figure 41). The bigger the difference between these two perspectives, the more complex last-mile infrastructure and operation will turn out to be. It is therefore necessary to understand the main characteristics of different rail production systems and to point out the respective impacts on last-mile infrastructure. This will be done firstly by general evaluation of processes performed by single wagon/block/intermodal trains (chapter 4.3.3.2.3) and secondly by selected use cases for dedicated production schemes (Annex I).

Figure 42 - General impact of rail production on last mile infrastructure



Source: HaCon

4.3.3.2.2. General overview

Roughly, the rail freight market can be broken down into segments for single wagons/wagon groups, block trains and intermodal transport. Table 29 gives an overview on the main characteristics of these three main categories.

Table 29 - Rail freight production systems: Main characteristics

Rail freight market segment		
Single wagon/wagon groups	**Block trains**	**Intermodal transport**
• Several production systems	• One production system	• Several production systems
• Mixed trains between private sidings (mainly) or public sidings, railports (rarely)	• Dedicated trains between private sidings	• Dedicated trains between intermodal terminals (mainly) or private sidings, railports (rarely)
• Loading collection/ distribution via rail	• No loading collection/ distribution	• Loading collection/ distribution via road (mostly) or rail (rarely)
• Dedicated stations for train splitting/composing	• No train splitting/ composing necessary	• Stations for train splitting/ composing = stations for cargo transhipment (terminals)
• Formerly: nationwide basic systems for “everybody” • Today: Open service, but only selected (big) customers	• Dedicated service for big customers	• Open services (“open trains”) vs. Dedicated services (“company trains”)
• Critical volume for each destination and for entire network required	• Critical volume for each customer-customer destination required	• Critical volume for terminal-terminal services (incl. catchment area) required
• No commodity restrictions, but affinity to dedicated cargo, e.g. steel, paper, chemical products	• Particular affinity to commodities, e.g. coal, ore, mineral oil, steel, automotive	• (Almost) No commodity restrictions to intermodal loading units

Source: HaCon

Generally, one cannot speak about “the” single wagon/block train/intermodal production system, since this item rather stands for a generic term representing a large variety of operation schemes. This particularly applies for single wagon traffic, but also for intermodal transport. Only block trains show comparably few operation variants; in this case, the freight market segment is about equal to the production system.

However, there are some important main characteristics representing all variants of the respective main categories:

The <u>single wagon</u> transport system used to be the standard transport system in the past. It was designed for area-wide coverage of each country. Due to this, it stands on one side for a network of train composing stations for bundling and distributing single wagons and wagon groups – in former days even part loads. In order or run such a network, a critical volume is requested not only for single destinations, but also for the entire network. On the other side, single wagon systems principally are open systems. This means that they incorporate all customers, all commodities and all types of wagons in mixed trains. Nowadays, origins/destinations of single wagon flows are mainly reduced to (large) private sidings with dedicated commodities.

<u>Block trains</u> always run between private sidings (1 train = 1 consignment = 1 consignment note). In contrast to single wagon trains, they are operated as fixed wagon compositions and do not request wagon collection/distribution processes. Thus, block trains are restricted to relations with large point-to-point volumes. In their pure configuration, they compose no network, but a compilation of single destinations with each critical volume to be achieved. Nevertheless, current production systems show a tendency towards mixtures of block and wagon group trains.

<u>Intermodal train</u> systems also show several variants. In most cases, trains start and terminate in dedicated terminals which are designed for loading unit transhipment as well as for train splitting/composing processes (as far as necessary). Collection/distribution of the loading units is dedicated to road pre-/end haulage. In case of direct/shuttle trains they operate similar to block trains; however, there are several intermodal production systems designed for transfer of loading units and/or wagon (groups) between trains (see paragraphs below). Regarding access by customers, open trains as well as dedicated services are known.

4.3.3.2.3. Principle requirements on last-mile operation and infrastructure

A further approach to the requirements of last-mile infrastructure can be achieved by analysing the main process steps of rail operation taking place in the facilities (incl. their transfer stations and connecting lines). Generally, these process steps are:

Train arrival → Inbound train splitting / wagon sorting → Inbound wagon buffering → (Loading / Unloading)[78] → Wagon parking → Outbound train composing → Train departure

As mentioned above, the requirements of these process steps to last-mile infrastructure/operation strongly depend on the respective (long haul) rail production system. Table 24 provides a generalised overview for the three main categories “Single wagon/wagon group systems”, “Block trains” and “Intermodal train systems”. **The text colours red / grey / green indicate high / medium / low resulting requirements for the last-mile infrastructure**.

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[78] The loading / unloading procedure is included here for reasons of completeness. Accurately, this is no rail operation, but a transhipment process.

Table 30 - Rail freight production systems – Principle requirements on last mile operation and infrastructure

Rail processes	Single wagon load/ wagon group systems	Block trains	Intermodal train systems
Train arrival	• Tracks must be capable for entire train length	• Tracks must be capable for entire train length	• Tracks must be capable for entire train length • Exception: Entry with momentum → no dedicated inbound track required, but high requirements on transhipment tracks
(Inbound) Train splitting, Wagon sorting	• Mixed, unsorted trains (commodities, loading areas, empty wagon types) • Sorting out wagon groups in case of liner systems (intermediate train stop), might be avoided by respective pre-sorting of wagon groups	• Entire train dedicated to 1 loading area → direct feeding out of inbound tracks (entire train or demanded lots)	• Entire train dedicated to 1 transhipment track → direct feeding from inbound tracks (entire train or dividing train to several transhipment tracks) • Train splitting in case of group/hub/liner systems
Inbound wagon buffering (time difference between train arrival and loading area demand) Loading/ unloading	• Frequent service of mixed trains reduces likeliness and duration of time buffer need • Sorting of wagon types required • No dedicated requirement to buffer track length	• High volume at the same time increases the likeliness of time buffer need • Required buffer track length = train length	• Train arrivals normally coordinated with slots in transhipment tracks • Buffer tracks for operational disturbances and for group/hub services • Required buffer track length = train length
Wagon parking	• Parking tracks for capacity reserve (single wagons, including damaged wagon exchange) • Sorting of wagon types required • Low requirements to buffer track length	• Parking tracks for capacity reserve (complete wagon sets) • Required parking track length = train length • Additionally: Tracks for (single) damaged wagon replacement	• Parking tracks in case of floating procedure (must be capable for entire train) • Additionally: Tracks for (single) damaged wagon replacement
(Outbound) Train composing	• Case (1) : One-side connection to next marshalling yard, mixed trains → No dedicated train composing necessary, collection of outbound wagons in departure tracks • Case (2): Two-side connection to next marshalling yard, mixed trains → Sorting of outbound wagons according to long-haul direction	• Direct transfer of wagon set from loading area to departure track	• Direct transfer of outbound wagons from transhipment tracks to departure tracks (see below) • Dedicated outbound train composing for group/hub/ liner services

Rail processes	Single wagon load/ wagon group systems	Block trains	Intermodal train systems
	• Case (3): Liner trains (intermediate stop) with dedicated wagon order • → Sorting of outbound wagons according to wagon group order		
Train departure	• Tracks must be capable for entire train length	• Tracks must be capable for entire train length	• Tracks must be capable for entire train length • Exception: Direct departure from transhipment track

Source: HaCon

- The train arrival normally takes place in the "transfer station" of the respective last-mile infrastructure (compare Figure 1). Independent from the type of production system, the inbound tracks must be capable for the entire train length, of course. As an exception, intermodal trains entering the terminal (transhipment track) "with momentum" do not need a dedicated inbound track; in these cases, the requirements regarding track length are valid for the transhipment tracks accordingly;
- In a next process step, particularly single wagon trains are to be split up according e.g. to their destinations (different loading areas in the facility), commodities and/or empty wagon types. This often requires extensive shunting operation and respective infrastructure for wagon sorting. In contrast, block trains do not need a split up in many cases. Only if the loading/transhipment track is not long enough for the entire inbound train, trains must be divided up according to the demanded loading length, but not to other criteria (e.g. commodity type). Thus, the requirements for these activities are particularly lower compared to single wagon traffic. Principally, this also applies for intermodal trains; complex sorting operations are necessary only in case of production systems with regular wagon transfers between the trains in the terminal;
- Depending on the logistic requirements of the loading areas and on the loading track capacities, inbound wagons might not be transferred into the loading track immediately after arrival, but need to be buffered before. In these cases, respective infrastructure must be foreseen. Block trains show comparably high requirements in this respect, as complete trains have to be stored. This is generally also valid for intermodal trains; however, since train arrival is normally coordinated with transhipment slots in intermodal terminals, the need for buffering should be restricted to operational disturbances or to group/hub systems, when connected trains might wait for each other. What concerns single wagon traffic is that the infrastructure requests refer to a sufficient number of tracks rather than to the track length in order to ensure appropriate sorting of the wagons;
- Last-mile infrastructure for wagon parking is needed for capacity reserve (empty wagons) and tracks for damaged wagons and their replacement. The need for this kind of infrastructure is independent from the type of production system. However, block train systems normally need complete trains as capacity reserve, not single wagons or wagon groups; therefore, the infrastructure requirements especially refer to the length of the parking tracks. In contrast, single wagons might be distributed to several (shorter) tracks, but with the need of sorting. Infrastructure requirements of intermodal trains are often similar to block trains. In case of floating procedure, additional parking tracks for (complete) unloaded wagon sets are demanded;
- After loading procedure, the outbound wagons must be composed to trains again. The easiest way to do so goes along with direct transfer of complete block or intermodal trains to the departure tracks. Dedicated composing procedures are only required, if the transhipment tracks are shorter than the foreseen length of the outbound trains. Intermodal terminals with electrified ends-of-tracks even allow for direct departure from the transhipment track. Thus, in best case intermodal and block train production systems require no train composing at all. For single wagon traffic, different cases have to

be distinguished: if all outbound wagons are routed via only one marshalling yard, a simple collection of the wagons in one departure track is sufficient. If in contrast the facility is connected to two or more marshalling yards each representing dedicated long-haul destinations, a respective sorting of the outbound wagons in several tracks is required. The most complex case occurs, if liner trains request sorting of the outbound wagons into these trains according to a dedicated wagon group order;

- The infrastructure requirements for <u>train departure</u> are generally equivalent to train arrival: All facilities must be connected to outbound tracks capable for the maximum expected train length. Intermodal terminals do not need dedicated outbound tracks, if train departure takes places directly from the transhipment tracks; for this purpose, the transhipment tracks must show a two-side connection to the main line and must be electrified outside the crane area.

As already introduced in chapter 4.3.3.2.2 the three main categories “single wagon/wagon group traffic”, “Block trains” and “Intermodal trains” show numerous operational variants in real life. For this reason, Annex I contains some of the most important production systems including their operational main characteristics. In order to facilitate overview and comparability, this is done in a standardised structure (“rail production chart”), each consisting of

- Operation principle, including consequences for long-haul transport and for last-mile infrastructure;
- Geographical occurrence;
- Commodities / Industrial branches / Volumes captured by the respective service;
- Main types of last-mile infrastructure involved, with reference to the defined four LMI main types (see chapter 1.3.1);
- Sources of information.

4.3.3.2.4. Summary, conclusions, trends

The analyses of rail freight production systems have shown the following main conclusions for the three main market segments (single wagon/wagon group trains, block trains, intermodal trains):

1. **<u>Single wagon/wagon group production systems</u>**

- Single wagon load transport has, due to its commercial risks and operational difficulties, already been totally abandoned in many European regions. Where ever these production systems are still in operation, they show a clear trend to further concentration:
  - High-volume (private) sidings will expand, whereas sidings with low volume will be abandoned. Stations with public sidings will more or less disappear. In total, last-mile infrastructure for single wagonload traffic will be reduced in the future. This reduction will (by far) not be balanced by additional or revitalised LMI;
  - Abandoned private and public sidings will be (partially) replaced by railports;
  - Remaining single wagon networks will reduce train composing levels (e.g. Germany: simplified “node hub system”) to save train composing infrastructure and to reduce the number of wagon transfers. This will lead to a higher share of direct connections between the marshalling yards and to a further increase of wagons per wagon group;
  - Complete single wagon networks will be given up when volumes fall below the “critical mass”. This particularly applies for countries in Eastern/South-Eastern Europe.
- In former times, single wagons transport consisted of domestic, more or less autarkic networks. Currently there is a tendency to cross-border connect these single systems. This applies for the remaining formerly state owned rail companies that intend to set-up pan-European networks as well as for privately organised consortia that will set up single wagon services for own purposes;
- Single wagon transport becomes wagon group transport. This can be shown by means of the increasing number of wagons that stay coupled when traversing marshalling yards (HaCon analysis for sample

marshalling yard: 2005: 2.5 wagons, 2012: 3.7 wagons). Inter alia this will lead to reduced sorting effort of inbound wagons in the LMI transfer stations;

- Former strictly separated production systems (Intermodal/SWL, Block trains/SWL) are becoming more and more merged to enhance train (path) utilisation;
- Some infrastructure for train composing is privately organised and commonly used by several rail operators in order to reduce fixed costs (e.g. shunting yards Wustermark, Falkenberg);
- The former use of single wagon services mainly consisted of supply-oriented, fixed offers by state railways ("take it or leave it"). This has been replaced by individual rail freight concepts following dedicated customer requirements;
- In this context, linertrain systems with wagon group exchange in dedicated hubs supplement or even replace the networks of complete train split-up/composing. Mostly, these new services are privately organised and often industry-specific (e.g. paper, chemical products). They provide connections to (regional) LMI feeder systems and are particularly suitable for the "start-up" of new market actors;
- However, the organisation of "individual" single wagon/wagon group systems is rather complex in many cases, since it requires cooperation of several rail freight and infrastructure providers. This bears the risk that
  - The failure of one partner might lead to failure of the total system;
  - The "critical mass" often depends on one/few customers.

  Thus, volume fluctuations and losses cannot often be balanced by a huge network as the former state owned single networks could; hence, many of these systems had only a short-term life. This unsecured mid-/long-term reliability has of course consequences for new customers who consider joining those services.

2. <u>Block train production systems</u>

- Block trains of any kind have to face the problem that they are restricted to a limited number of customers from some specific industries (e.g. automotive, coal, coke) with sufficient volume for direct transport from siding to siding;
- For mid-term future it is foreseeable that political framework conditions (climate change, new energy sources) will lead to a decrease of these dedicated block train volumes (e.g. coal, mineral oil);
- Nevertheless, block trains are and will be the preferred production system of railway operators and customers (owners of private sidings) due to minimised operational effort and simple LMI infrastructure/operation;
- From the customers' side a tendency is evident to expect from their suppliers to pre-bundle inbound volumes. In so doing, single wagon transport becomes block train transport. An example for this development is metal scrap transport for steel plants that used to be classical single wagon transport from many suppliers. This is becoming replaced more and more by concentration of few big scrap suppliers who are able to consolidate their volumes to block trains;
- Railway operators intend to merge block train systems with single wagonload in order to maximise train capacity utilisation (e.g. Netzwerkbahn) and to reduce empty runs (general economic problem of block trains). Other tendencies show the implementation of hub systems (e.g. automotive) to make former single wagon flows "block train-able". This leads to a further optimisation of block train services but withdraws volumes from single wagon systems ("critical mass").

3. <u>Intermodal train production systems</u>

- The terminal generation that represents the status of intermodal transport in Europe mainly aims at optimisation of current (inhomogeneous) framework conditions regarding infrastructure and operation. The infrastructure side can be roughly structured into:
  - "Greenfield" configurations designed for direct/shuttle trains vs.
  - Terminals located in historically grown infrastructure (marshalling yards, inland ports) with respective restrictions regarding connection to the line, track length etc.

  For the rail processes, this means that:
  - Some terminals provide standardised, partially automated operation (e.g. seaport terminals), whereas;
  - Other terminals show individual rail processes with high operational effort.

  For the further development of the current generation of intermodal terminals, the following trends are foreseeable:
  - Commercial tendency towards direct and shuttle trains;
  - Forecasted volume increase will be operationally captured by the floating procedure with an additional demand on parking tracks;
  - Increasing maritime volumes lead to higher demand on storage area and additional services;
  - Gateway/hub systems require additional terminal infrastructure for buffering (tracks for shunting systems, LU storage area for rail/rail transhipment systems);
  - Implementation of alternative container constructions to make more goods intermodal-able, e.g. by Neska Intermodal: black-boxX (open-top) – coke, scrap, briquettes, waste; blue-boxX (open-top with water-resistant cover); grey-boxX (side doors, open-top with and without cover).
- The next terminal generation (from ~ 2020) will be based on industrialisation of intermodal transport. This includes e.g. the following components:
  - Standard layout for reduction of operational effort:
    - Train entry by momentum;
    - Direct train departure from transhipment tracks;
    - Avoiding of train splitting/composing;
  - Modular terminal standard layout with gantry cranes (optimised conventional transhipment):
    - Two-side rail connection of the terminal to the line;
    - Track layout capable for entire trains (length of transhipment tracks, length of crane runway);
    - End of transhipment track electrification;
  - Partly automated transhipment devices/operation:
    - MegaHub terminals for direct rail/rail transhipment;
    - Crane control systems to avoid interferences of simultaneous crane and rail movements;
    - Exact positioning of gantry cranes via adjustments points or GPS;
    - Automatic pin positioning.

4.3.3.3. Technical developments

Particular impacts on last-mile services are expected from technical developments on the locomotive and freight wagon sector. Thus, an analysis on current and predictable technical trends relevant for last-mile operation has been carried out. This analysis encompasses existing developments and current projects focused on bi-modal and hybrid locomotives as well as on self-propelled technologies and the current trend towards freight wagon standardisation. These development clusters have been selected as they particularly refer to shunting operations

- Between incoming parking tracks and loading / unloading tracks;
- Between loading / unloading tracks and outgoing parking tracks;
- For additional logistical processes and service needs (e.g. weighing, cleaning, maintenance/repair).

The "classic" operation method is the employment of conventional shunting locos. There have been a number of projects developing technologies and strategies to avoiding/minimising shunting operations. This is due to the fact that in particular wagon movements, by the operation of shunting locos, are time and cost consuming and partly limit the efficiency of transport and logistic chains of the respective customers. Depending on freight volumes, delivery frequencies, size and layout of infrastructure, number and weight of wagons different technologies can be applied.

The details of the analysis of technical developments are compiled in Annex J. Summarising, technical solutions affecting the efficiency of rail freight operation on last last-mile infrastructure are available with different fields of application divergent market perspectives (see Table 31).

Table 31 - Summary of relevant technical developments

Technical development	Effects on LMI		Market relevance/ remarks
	Application field	technical	
Bi-modal vehicles (rail-road vehicles)	Small/medium sized LMI	Not relevant	Market-proven technology operation limited to not public private LMI infrastructure
Hybrid locos	Medium-sized and large infrastructure	Double-sided connection necessary	Depending on engine size: limited market relevance for large locomotives
Self-propelled wagon	None		No market relevance (most likely also in the future)
Standardised wagon	All LMI types		High share in the future

Source: HaCon

The operation of bimodal vehicles can be regarded as a state-of-the-art technology: in particular, for shunting services in smaller sidings with low traffic volumes, these vehicles have found their market niche. Bimodal vehicles only require a levelled section of rail tracks for entering or leaving the tracks as an additional technical feature. Different types of engines are available and customers can easily adapt the performance to their specific needs. A challenge is the operation of these vehicles on public rail infrastructure. The planned operation on public rail infrastructure within the ViWaS project had shown that due to restrictive regulations problems still have to be solved which most likely block a cost-efficient operation.

The same applies for hybrid locomotives. Today, manufacturers offer locomotives with different dual propulsion technologies. Of course, this technology has advantages against the background of environmental aspects. All except for the Stadler Eem 923, these engines are currently not very widely spread in the rail freight market due to their "prototype" status and the higher costs for purchase and maintenance. They offer in particular benefits for seamless operation between long haul transport and last-mile infrastructure. Nevertheless, is has to be considered, that operation with diesel engine lowers the traction performance and the speed. Therefore, engines like the Bombardier Traxx F14 will have their strengths primarily in serving block trains in intermodal terminals and seaport terminals, which are not equipped with overhead wires.

Self-propelled rail wagons have not left the prototype status either. Compared to classic train concepts, they are noticeably more expensive, have payload losses due to the additional weight for the engine and necessary modules for driving and controlling. Therefore, it can be expected, that this vehicle concept will not leave the prototype status and have a noticeable role in the future rail freight market.

The standardisation of freight wagons already today plays an important role. Beside advantages in operation costs and, partially in payload, especially their multifunctional usability offers high potential for the increase of competiveness of rail freight by reduction of:

- High number of specialized wagons;
- Cost for (seasonal) provision and shunting;
- Cost for maintenance efforts;
- Empty runs.

This also will have effects on needs infrastructure needs for parking capacity and shunting efforts in rail yard and sidings.

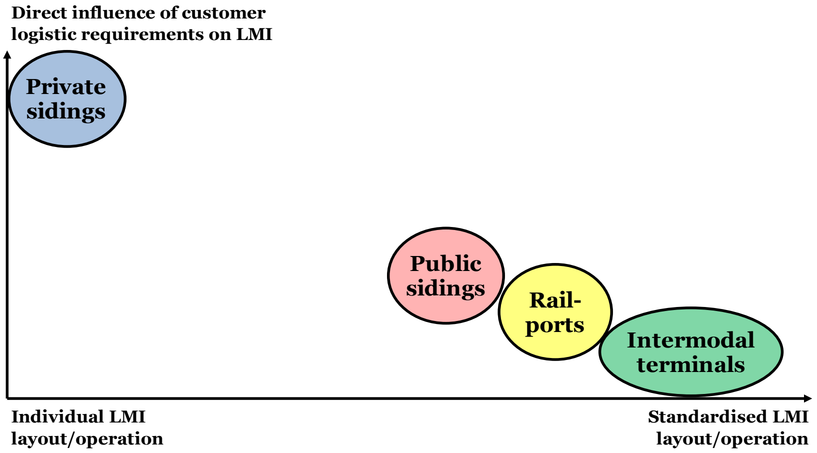
4.3.3.4. Logistic requirements of industrial clusters and their impact on last-mile infrastructure/operation

As shown in the previous chapters, last-mile infrastructure and operation is influenced by various framework conditions. One of the most relevant factors are the logistic requirements of dedicated customers, such as:

- In- and outbound volumes;
- Frequency of delivery;
- Time slots for loading activities;
- Dedicated wagon types;
- Demanded wagon order/composition;
- Special goods' treatment (e.g. hazardous goods);
- Special wagon treatment (e.g. wagon cleaning, weighing).

Generally, these preconditions might influence the layout of all types last-mile infrastructure as well as the respective rail operation. However, in reality this particularly applies for private sidings rather than for railports/rail logistic centres, stations with public sidings or intermodal terminals. As Figure 42 points out, this is due to the fact that rail layout and operation of private sidings are directly determined by the individual framework conditions of product manufacturing; in many cases this infrastructure has been modified along with changes of production technology. In contrast, railports, public sidings and intermodal terminals are designed for a large variety of cargos or for standardised loading units and thus show a tendency towards standardised rail layout configurations.

Figure 43 - Influence of customer logistics requirements on different types of LMI



Source: HaCon

For this reason, the following analyses mainly refer to private (industrial) sidings and their associated customers. In this context, three main work steps have been executed:

- Identification of industry clusters with particular relevance for last-mile infrastructure;
- Analysis of main logistic requirements per industry cluster with regard to last mile infrastructure/ operation. As explained above, these logistic requirements are highly individual and thus would have to be captured for each single customer/company. However, this procedure would go far beyond the scope of this study. Therefore, this work step concentrates on providing generalised conclusions, main trends and crucial aspects to be considered within the context of last-mile infrastructure. These basic results will be enriched by
- Illustrating the interdependencies between logistic requirements and last-mile rail infrastructure/ operation for selected examples per industry cluster.

In doing so, the following main data/information sources have been exploited:

- Analysis of funding projects;
- Desktop research;
- Experience/knowledge of the consortium (previous projects);
- Exploitation of statistics (volumes, commodities);
- Stakeholder consultation (online questionnaires) and
- Interviews with selected stakeholders.

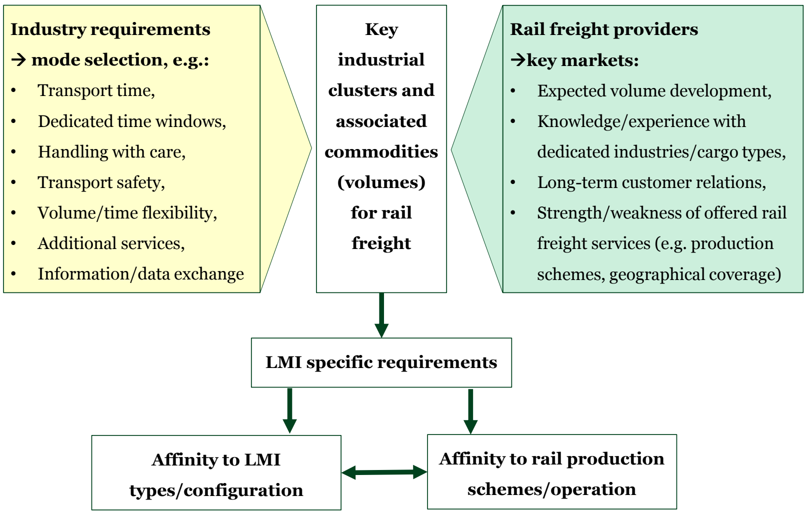
4.3.3.4.1. Identification of key industrial clusters

Within this study, industrial clusters stand for dedicated kinds of economic activities (predominantly product manufacturing). These activities are represented by commodity specific volumes, which in turn allow for referring to rail freight statistics.

Some of these clusters can be labelled as "**key industrial clusters for rail freight**". As Figure 43 shows, they are characterised by

- Long-term business connections between industry and rail (e.g. steel, coal);
- Expected future developments of dedicated market segments and (most of all)
- Compliance between shippers' selection criteria and strength/weakness of offered rail freight services.

Figure 44 - Deduction of key industrial clusters



Source: HaCon

With respect to the respective product manufacturing framework conditions, the rather general mode selection criteria can be specified to requirements of the last-mile infrastructure layout. This also allows concluding on affinities to the different types of last-mile infrastructure and to the characteristics of rail production schemes (see chapter 4.3.3.2).

According to this methodical approach, **twelve "key logistic clusters for rail freight" have been identified**: Agriculture/food products, Coal, Ores, Building materials, Paper/Wood, Mineral oil products, Chemical products/fertilizers, Steel/Metal products, Industrial/consumer goods, Automotive products, Waste & Recycling and Intermodal transport.

The labelling of these clusters is generally based on the "International Standard Industrial Classification (ISIC)", but has been adapted from case to case according to often-used appellations of key markets in rail freight business.

Seven out of these 12 clusters can be classified as traditional markets for conventional rail freight. They are settled around energy (coal, mineral oil products), steel (coal, coke, ore, and steel/metal products), automotive, chemical products and paper/wood. As an assignment to NST commodities (Table 32) shows, these traditional markets contribute by 64% to the overall rail freight volume in EU28+2. They are generally characterised by strong market positions compared to road and inland waterways, but also by a rather stagnant/decreasing perspective for the future (exception: chemical products).

In contrast, other key clusters show particularly high volume development forecasts, but only small current modal shares of rail freight (e.g. industrial/consumer goods, food products, waste/recycling).

In total, the twelve key clusters cover more than 90% of the European rail freight market. This is also due to the strong position and contribution of intermodal transport. This market segment particularly is expected to increase above average in the future.

Table 32 - Key industrial clusters and assignment to NST commodities and LMI types

Key industrial clusters for rail freight	No.	Title included in NST commodities	Rail freight volume EU28+2			Dedicated affinity to LMI types			
			Rail [1000t/a]	Share of total rail	Modal split	Private sidings	Public sidings	Railports	Intermodal terminals
Agriculture/food products	GT01 GT04	Products of agriculture, hunting, and forestry; fish and other fishing product Food products, beverages and tobacco	107.535	6%	3%	✓		✓	
Coal	GT02	Coal and lignite; crude petroleum and natural gas	321.436	18%	53%	✓			
Ores	GT03	Metal ores and other mining and quarrying products; peat; uranium and thorium	260.325	15%	6%	✓			
Building materials	GT09	Other non-metallic mineral products	53.995	3%	3%	✓	✓		
Paper/Wood	GT06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media	49.687	3%	8%	✓	✓ (wood)	✓ (paper)	
Mineral oil products	GT07	Coke and refined petroleum products	184.797	11%	22%	✓			
Chemical products/Fertilizers	GT08	Chemicals, chemical products, and man-made fibres; rubber and plastic products; nuclear fuel	106.849	6%	15%	✓			
Steel/Metal products	GT10	Basic metals; fabricated metal products, except machinery and equipment	165.556	9%	22%	✓		✓	
Industrial/Consumer goods	GT05	Textiles and textile products; leather and leather products	8.381	0%	2%	✓		✓	

Key industrial clusters for rail freight	No.	Title included in NST commodities	Rail freight volume EU28+2			Dedicated affinity to LMI types			
			Rail [1000t/a]	Share of total rail	Modal split	Private sidings	Public sidings	Railports	Intermodal terminals
	GT11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks							
	GT13	Furniture; other manufactured goods n.e.c.							
Automotive products	GT12	Transport equipment	32.803	2%	12%	✓			
Waste & Recycling	GT14	Secondary raw materials, municipal wastes and other wastes	51.706	3%	4%	✓			
Intermodal transport	GT16	Equipment and material utilised in the transport of goods	293.309	17%	34%				✓
	GT19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16							
		Total	**1.759.562**	**93%**	**10%**				

Traditional key industries for conventional rail freight

Source: HaCon, Eurostat

These main conclusions are the basis for the following assessment of industry specific requirements on last-mile infrastructure and operation. Furthermore, they are an important ingredient for the forecast model, particularly for the assignment of transhipment volumes to the respective types of LMI (chapter 4.4).

4.3.3.4.2. Main logistic requirements of the industry clusters

A first rough assessment of the logistic characteristics leads to an estimation of affinity to the different types of last-mile infrastructure (compare Table 32): Except for intermodal goods, private sidings play the main role for volume receipt and consignment in all key clusters. Additionally, the concept of railports/rail logistic centres (rail/road transhipment + additional logistic services) shows particular congruence with requirements of the clusters “Food products” (palletised goods), “Paper”, “Steel” and “Industrial/consumer goods”. The relevance of public sidings is generally restricted to dedicated niche markets (mostly wood, partially building materials).

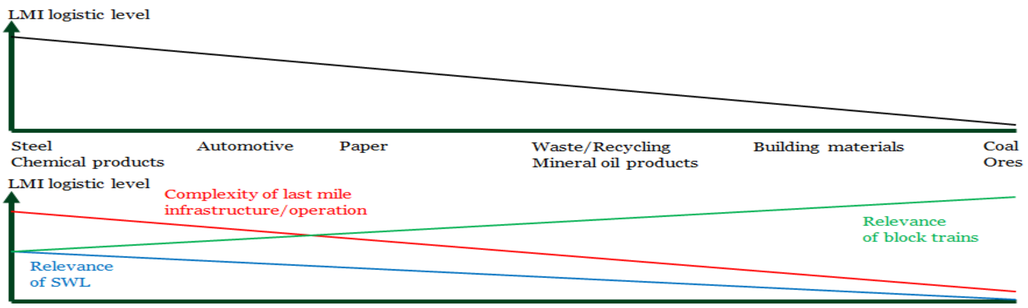
Focussing on private sidings, experience with numerous rail projects shows that the complexity of last-mile infrastructure and operation increases, if

- The customer´s manufacturing comprises various products, which are represented by numerous loading points at the same site/plant;
- The product manufacture shows a high vertical range; the locations of manufacturing inside the same site/plant are connected via rail;
- Several railway operators perform delivery and distribution of products. Wagons of the different operators must not be mixed up;
- Delivery and distribution of products require different, special wagon types. The service of the loading points demands a dedicated wagon composition and/or wagon order;
- The loadings points at the same site/plant have dedicated, different slots for wagon loading/unloading;
- Special goods’/wagon treatment is required (e.g. dangerous goods, weighing, cleaning);
- Although always being a crucial factor, last-mile infrastructure/operation is not exclusively determined by transport cost.

The entirety of these indicators is aggregated to the “LMI logistic level”. This qualitative unit describes if and to which degree the above listed framework conditions are fulfilled at a dedicated site/plant with a private siding. It is thus an indicator for the level of logistic requirements associated to last-mile infrastructure and operation.

An assessment of the LMI logistic level for the industrial key clusters is shown in Figure 44. It must be stated clearly that this ranking represents a generalised view; exceptional cases might of course occur in every industrial cluster. However, there is a clear tendency from industries with a particularly high LMI level (especially steel, chemical products, automotive) towards clusters with rather simple logistic requirements (bulk, like coal or ores).

Figure 45 – LMI logistic level for industrial key clusters and impact on LMI



Source: HaCon

The logistic level can also be used to classify the industrial key clusters according some main LMI parameters: Companies/sites with a high LMI logistic level usually show rather complex

last-mile infrastructure and rail operation procedures (see sample use cases). In many cases, this goes along with a high relevance of single wagon/wagon group traffic.

At the opposite end of the scale clusters like coal transport (e.g. to power plants) are mainly determined by large volumes for low costs and therefore dependent on simplified infrastructure and operation - on the last mile.

These general explanations have been illustrated by uses cases of selected key industry clusters (Steel, Chemical products, Automotive, Mineral oil products). They are presented in Annex K. All given examples are based on existing cases, representative for the respective industry cluster. Due reasons of confidentiality and facilitated overview, the provided rail layout and operation have been anonymised and simplified. However, the main characteristics – as far as relevant for this analysis – have been maintained.

4.3.4. Results of the stakeholder consultation

4.3.4.1. Objectives of the stakeholder consultation

The stakeholder consultation represents the market view on current usage and future demand of last-mile infrastructure. Its main objectives are therefore to verify and further specify the (general) analyses of the rail/ logistics market (see chapters 4.3.1 – 4.3.3) and to enunciate dedicated needs for investments in last-mile infrastructure.

Next to interviews with dedicated market actors and experience of the consortium gathered in previous studies, **the main part of stakeholder consultation has been performed by means of an online questionnaire**. In so doing, qualitative and quantitative can be compared and analysed accurately. Moreover, the electronical spreading of the questionnaire allows for addressing numerous stakeholders and their associations, which in turn is required to gather a representative picture and a profound data basis for the subsequent work steps.

The previous chapters have shown that last-mile infrastructure issues depend of various framework conditions, like market developments, logistic requirements, rail operation procedures or technical equipment. Thus, with view of the main objectives of this study, the following aspects were settled in the focus of the stakeholder consultation:

- Size and composition of the existing last-mile (rail) infrastructure;
- Exploitation of last-mile infrastructure and demand for expansion;
- Condition of the last-mile infrastructure with respect to renewing needs;
- Impact of different industrial sectors/clusters and associated commodities;
- Volume/market development expectations;
- Influence of rail productions systems.

4.3.4.2. Design of the questionnaire

The analysis of the relevant framework conditions has revealed manifold interrelations between the configuration of last-mile infrastructure (represented by the four LMI types), the LMI operation (represented by the production systems), the logistic requirements (represented by different stakeholders and industry clusters) and the market development (represented by commodities/volumes). It is therefore necessary to reflect on these connections when designing the questionnaire. Concluding, four different kinds of questionnaires have been developed (see Annex C), each of them addressing dedicated types of last-mile infrastructure and associated stakeholders. In this context, stakeholders stand for the owners and operators of the respective last-mile facilities. This procedure allows for specific assignment of all relevant attributes and the connection between them.

Table 33 provides an overview on the topics included in the questionnaires. **Content and design of the single questions were discussed in detail intensively and finally agreed within the consortium as well as with the European Commission.**

The compilation shows that all relevant subjects – as indicated in chapter 4.3.4.1 – are covered. Moreover, the questionnaires capture the data in a very detailed way, especially for private sidings that account for the lion's share of last-mile infrastructure and show particularly individual infrastructure configurations and logistics requirements (compare chapter 4.3.3.4). This detailed approach is on one hand necessary to compose a differentiated picture and to conclude accurately on dedicated needs by infrastructure type or industry cluster. On the other hand, this might of course reduce the willingness to fill out the complete questionnaire.

Table 33 - Main topics of the four types of online questionnaires

	Questionnaire No.			
	1	2	3	4
Reference to LMI type	Private sidings	Stations with public sidings	Railports/Rail logistics centres	Intermodal terminals
LMI type occurrence in EU28+2	ca. 15,600	ca. 5,600	ca. 190	ca. 730
Stakeholders addressed	Shippers Forwarders Railway operators	Infrastructure managers	Railway operators	Terminal operators
Facility location	✓	✓	✓	✓
Industry branch	✓	n.a.	n.a.	n.a.
Further facility specifications	Size of private siding (classes)	-	-	Maritime/ continental markets Transport modes
Existing rail infrastructure	Infrastructure devices: Tracks (by track function), Switches (by operation mode), Operational infrastructure For each device: Number/length, Maturity, Maintenance costs	Total number of owned/managed stations	Infrastructure devices: Tracks (by track function), Switches (by operation mode), Operational infrastructure For each device: Number/length, Maturity, Maintenance costs	Infrastructure devices: Tracks (by track function), Switches (by operation mode), Operational infrastructure For each device: Number/length, Maturity, Maintenance costs
Transhipment devices	Type Number Maturity Maintenance costs	-	Type Number Maturity Maintenance costs	Type Number Maturity Maintenance costs
Current volumes	Production syst.: Single waggons, Block trains, Intermodal traffic (via private siding) For each prod. syst. Number of wagons Tonnes Main commodities	Conventional transport only Number of wagons Tonnes Main commodities	Production syst.: Single waggons, Block trains For each prod. syst. Number of wagons Tonnes Main commodities	Intermodal markets: Maritime, Continental For each market: Number of LU/TEU (by loading unit type)
Current capacity utilisation	✓	✓	✓	✓
Expected volume development	✓	✓	✓	✓
Investment plans, use of funding	✓	✓	✓	✓

Source: HaCon

4.3.4.3. Execution of the survey

The questionnaires were designed to be answered online. This procedure should make it as convenient as possible for the stakeholders to answer and therefore optimise the return quota. **PwC performed the electronic composition and distribution during spring/summer 2015.** The technical set-up also contained an analysis tool allowing for direct transfer of the feedback into an Excel database.

The recipients were addressed differently. On one hand, networks of the consortium have been exploited to address companies directly. This procedure applied for 784 stakeholders belonging to the following clusters:

- Questionnaire 1 (Railway associations [28], Industries [146], other associations [4]) = 178;
- Questionnaire 2 (Infrastructure managers) = 33;
- Questionnaire 3 (Railway companies and associations, port authorities) = 164;
- Questionnaire 4 (Intermodal terminal managers, Logistic nodes/Freight village managers, Logistics associations) = 409.

On the other hand, relevant associations were contacted and asked to forward the questionnaire to their members. The following associations have been involved:

- Questionnaire 1 = ERFA, ESC, CLECAT, EIA;
- Questionnaire 2 = EIMB;
- Questionnaire 3 = ESPO;
- Questionnaire 4 = UIRR.

Furthermore, the following industry associations were involved:

- CEPI;
- ECG;
- CEFIC;
- FIEC;
- EuroCommerce;
- EFRTC;
- UECC;
- COCERAL;
- Eurometaux;
- EURACOAL;
- European Industry of Pellet Suppliers;
- European Association of Mining Industries, Metal Ores & Industrial Minerals;
- EUROSIL;
- CCA EUROPE;
- EUROALLIAGES;
- PROFEL;
- EUCOFEL;
- EAA.

As there has been no response of the associations on the amount of addressed member companies, there can be no accurate statement about the total number of contacted stakeholders. However, the described approach allowed for a Europe-wide addressing of stakeholders for all LMI types and industry clusters.

The distribution of the survey invitations took place in summer 2015; the questionnaires were online and ready to be answered between 30th of June and 31st of August. During this period, a reminder was sent out to the listed companies and associations in order to once again raise awareness on the survey.

4.3.4.4. Results of the survey

4.3.4.4.1. Feedback

With closure of the online survey in September 2015, 53 questionnaires had been filled out and were for analysis. As Table 34 shows, more than 80% of this feedback is allotted to questionnaire 1 (private sidings).

As the total number of actual recipients is unknown (compare chapter 4.3.4.3), the response rate refers to the number of questionnaires that were opened by click on the link. Thus, this rate is about 11% for the questionnaires 1, 2 and 4. Referring to the total number of LMI occurrence in Europe (compare chapter 4.2.1) this means coverage of clearly less than 1%. The railport questionnaire has not been answered at all.

Table 34 - Feedback of the online stakeholder consultation

	Q1 Private sidings	Q2 Stations with public sidings	Q3 Railports/ Rail logistics centres	Q4 Intermodal terminals
Number of questionnaires opened by clicking the link	403	35	28	47
Thereof (partially) filled out questionnaires	44	4	0	5
Response rate	10.9%	11.4%	0%	10.6%
Response represents total occurrence in EU 28+2 by	0.3%	n.a. 1)	0%	0.7%
Geographical response	BE, DE, FR, IT, NL, SE	BE, HU, PL, SK	-	BE, IT, PL

1) no dedicated sidings were addressed, but infrastructure managers responsible for numerous stations with public sidings

Source: HaCon

For the subsequent work steps, this has the following consequences:

- The sample is in no way statistically significant and thus cannot be used as data basis for prognosis of last-mile infrastructure investment needs in Europe;
- In order to fulfil the objectives of the study, these last-mile infrastructure needs must therefore be determined by model calculations. This is explained in detail in chapter 4.4;
- The results of the online survey are usable for verification and validation of the model parameters;
- Only for questionnaire 1 (private sidings), a detailed view on the survey results is reasonable. However, the limited significance of this small sample must be kept in mind when drawing conclusions.

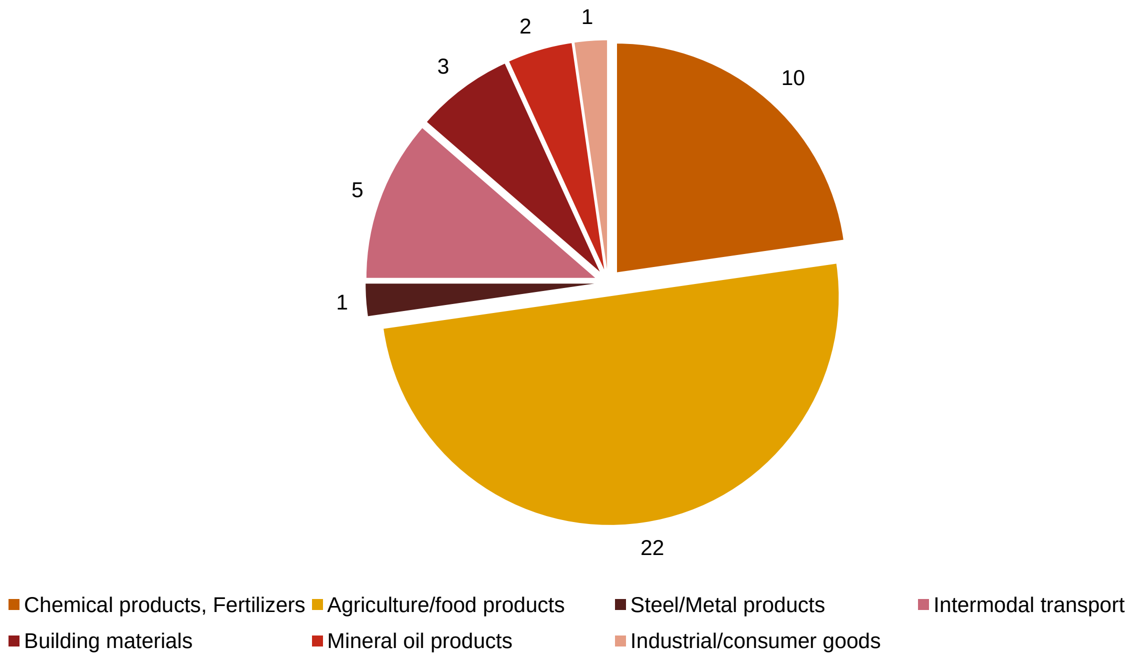
The 44 filled-out questionnaires for private sidings have origin in seven countries. As Figure 45 visualises, most of them come from France (22) and Germany (14). 20 out of 22 French questionnaires result from two large companies that sent data for their different locations in France. A similar case can be observed in Germany with three locations/questionnaires belonging to one company.

Figure 46 - Questionnaire 1: origin of responses (total = 44)

Source: HaCon

The distribution of the questionnaire 1-response to industrial branches is shown in Figure 46, referring to the same branch labelling as used for the identification of key industrial clusters for rail freight (compare chapter 4.3.3.4.1). It is evident that the majority of the sample belongs to the clusters “Chemical products/fertilizers” (22 locations) and to “Agriculture/food products” (10 locations). The remaining 12 questionnaires are assigned to five branches; the companies of the cluster “Intermodal transport” are no transport providers but perform services like loading unit maintenance/repair.

Figure 47 - Questionnaire 1: response by industrial branch (total = 44)



Source: HaCon

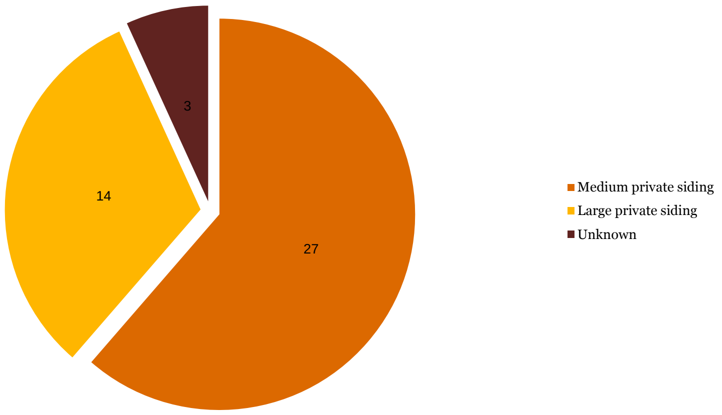
4.3.4.4.2. Existing rail infrastructure

The recipients of the private siding-questionnaire were asked to assign themselves to three size clusters of rail configuration (see Figure 2 in paragraph 1.3.1). Incomprehensibly, this partially led to obviously wrong declarations, being inconsistent with other statements on the rail infrastructure. Thus, the existing rail infrastructure has been classified according to a proposal by SBB Cargo[79]:

- Small sidings: total track length ≤ 300 m;
- Medium sidings: total track length > 300 m and ≤ 1,500 m;
- Large sidings: total track length > 1,500 m.

According to this categorisation, 27 (out of 44) private sidings belong to the "medium", 14 to the "large" class. The remaining three questionnaires did not contain analysable data. Thus, the sample does not contain any "small" siding (see Figure 48). This overall picture seems plausible, since it confirms the trends towards concentration on medium/large sidings and abandoning smaller facilities.

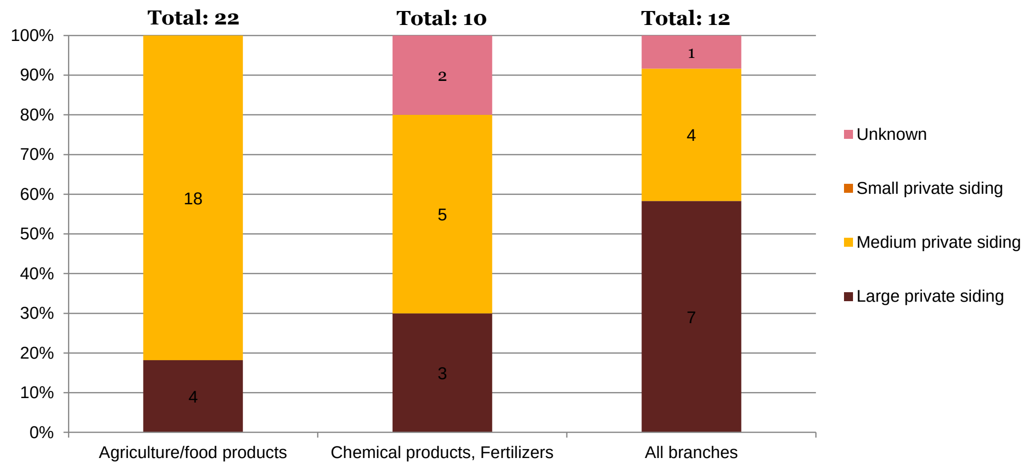
Figure 48 - Questionnaire 1: response by size class of siding (total = 44)



Source: HaCon

A look at the allocation to industrial branches shows that the private sidings of the agricultural/food sector are predominantly middle-sized (Figure 47). This is according to expectations, as sidings of this sector often show a rather simple rail layout designed for block train operation (see also chapter 4.3.4.4.3).

Figure 49 - Questionnaire 1: response by size class of siding and industrial branch (total = 44)



Source: HaCon

[79] SBB Cargo: „Anschlussgleise als Schlüsselfaktor im Wagenladungsverkehr"; Final report; Basel 2009

The equipment of the private sidings with rail infrastructure is compiled in Table 35. On average, medium private sidings were equipped with 3 tracks of totally some 860 m length. This means that these sidings were considerably larger that the limit value (300 m). The same applies for the large sidings: these possessed 23 tracks with 7,750 m total track length on average (limit value = 1,500 m). In this context, one extremely large facility that would have had an extreme impact on the average calculation was not considered. This one siding showed 189 tracks with more than 200 km total track length.

Table 35 - Questionnaire 1: Rail infrastructure equipment by size class of siding (total = 43)

	Average number of		Average total length of tracks
	Tracks	Switches	[m]
Small private sidings	-	-	-
Medium private sidings	3	3	859
Large private sidings	23[1)]	26[1)]	7,750[1)]
All sample sidings	10[1)]	12[1)]	3,098

1) without one extremely large company dominating the entire sample (189 tracks, 750 switches and 204,762 m of total track length)

Source: HaCon

According to expectations, the vast majority (70%) of the private sidings' switches are manually operated. Electric switches can be found in the connection of the siding to the long-haul network and within the large sidings (mostly in the in-/outbound tracks). Loading tracks are predominantly connected via manually operated switches or – in exceptional cases – via locally electric devices.

40 participants provided information about the maturity of the infrastructure. Generally, the respective figures differed - if at all - only slightly for in-/outbound tracks, loading tracks, parking tracks or switches. The range was between 1 year and 60 years with an average value of 30 years. The majority of the private sidings' rail infrastructure was between 30 and 40 years old.

The annual maintenance costs for tracks and sidings are compiled in Table 36. Again, it must be stressed that these figures strongly depend on single statements with limited general validity. However, the average maintenance costs per metre of track point out plausibly favourable values for the large sidings and for those branches that merely consist of rather large facilities (chemical and others rather than agriculture). On average, the sidings of the questionnaire sample estimate 12 € per m track as annual maintenance costs.

Table 36 - Questionnaire 1: Infrastructure maintenance costs

Industry branch	Annual maintenance costs per m of track	Switch operating mode	Annual maintenance costs per switch
Agriculture/food products	42 €	Electric	6,400 €
Chemical products/ fertilizers	8 €	Manual	3,600 €
Other branches	20 €	Locally electric	n.a.
Total	**12 €**	**Total**	**3,900 €**
Type of siding	**Annual maintenance costs per m of track**		
Medium private sidings	40 €		
Large private sidings	10 €		
Total	**12 €**		

Source: HaCon

For switches, annual maintenance unit costs of about 3.900 € have to be a calculated according to the information provided by the respondents. Not surprising, the costs for electric switches are particularly higher compared to manually operated switches.

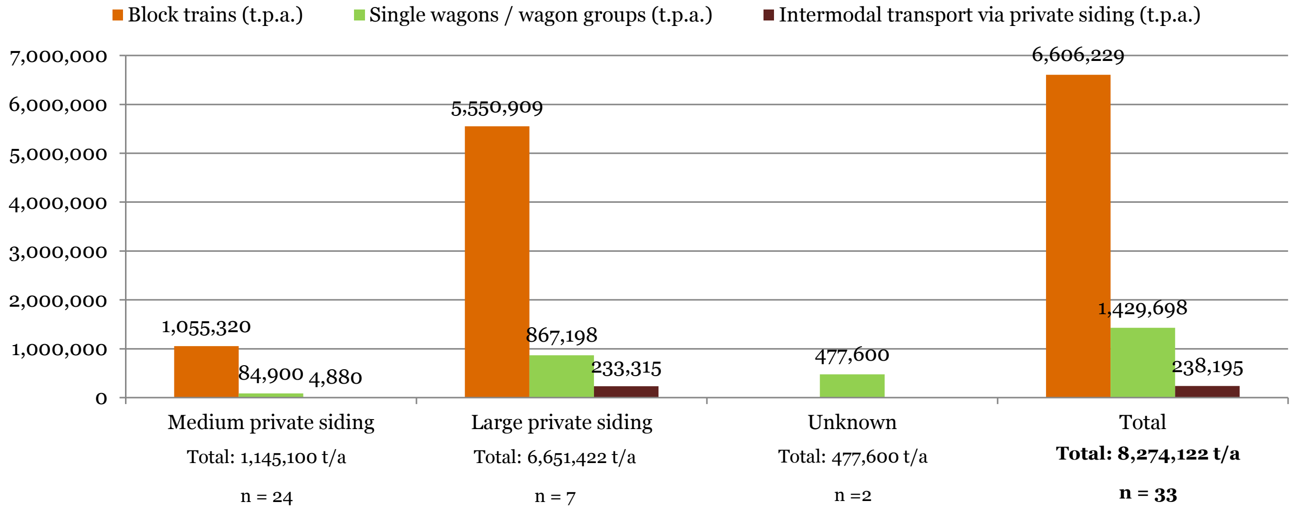
4.3.4.4.3. Current and future rail freight volume

33 out of 44 private siding owners provided rail volume data in [t/a]. Totally, these 33 sidings account for 8,3 million tonnes of rail freight in 2013 (250 kt per siding on average), representing 0,6% of the overall conventional rail freight volume in Europe (compare chapter 4.3.2.5). Compared to the share of siding occurrence (0,3%) this means that the sidings of this sample show an above average volume. However, in this context is has to be observed that about one-third of the overall volume is allotted to solely one large company.

As Figure 48 shows, 80% of the overall volume is transported by block trains, 17% by single wagons/wagon groups. Intermodal transport via private sidings plays only on minor role. This dominating position of block trains applies for medium sized as well as for large private sidings.

The figure also shows the above average position of large sidings; 6,7 million tonnes (=80% of the total sample volume) is transhipped via this siding class, thereof 40% solely by one extremely large company.

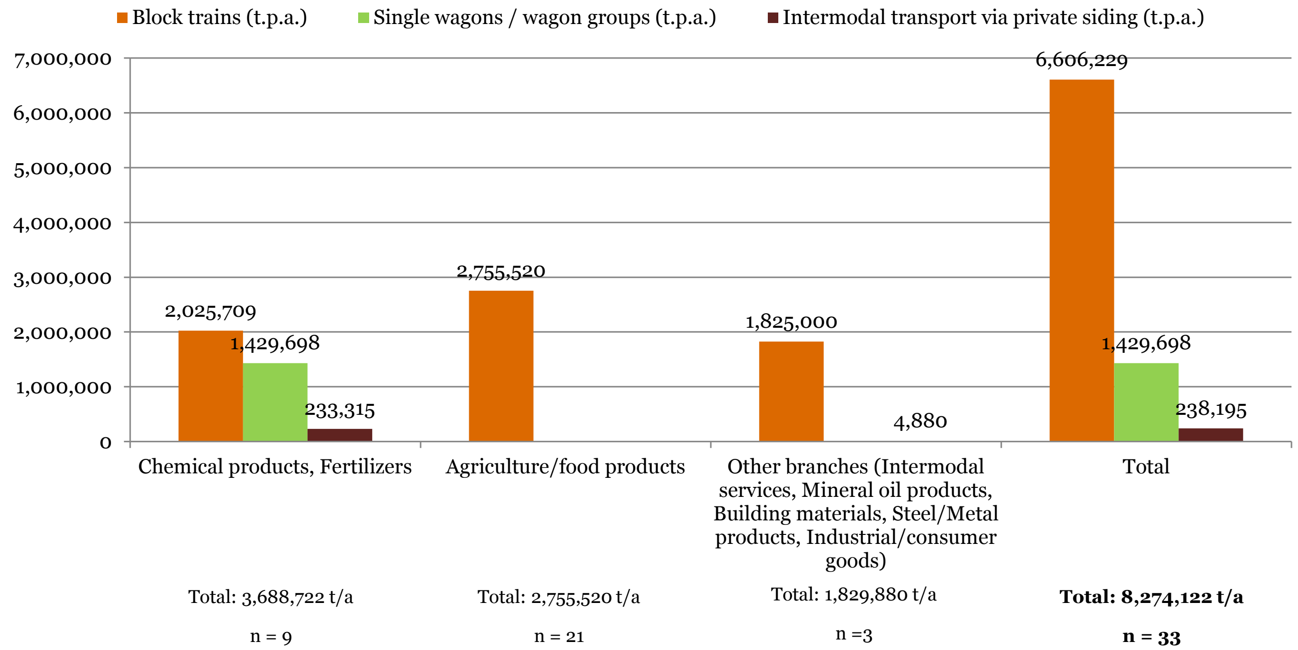
Figure 50 - Questionnaire 1: Annual transport volumes [t] by production system and size class of siding (inbound + outbound)



Source: HaCon

The distribution of the private sidings' rail tonnage to the main industry clusters is visualised in Figure 50. Almost 80% of the overall volume is allotted to chemical and agricultural products. Particularly interesting is the high share of single wagon transport within the chemical industry cluster (almost 40%). This is in line with the general connections between industry clusters and production systems shown in the logistics requirements analysis (LMI logistic level, see chapter 4.3.3.4.2). In addition, the missing single wagon transport within the agricultural cluster fits to those findings: Agricultural products often show a rather simple rail layout and a high affinity to block trains.

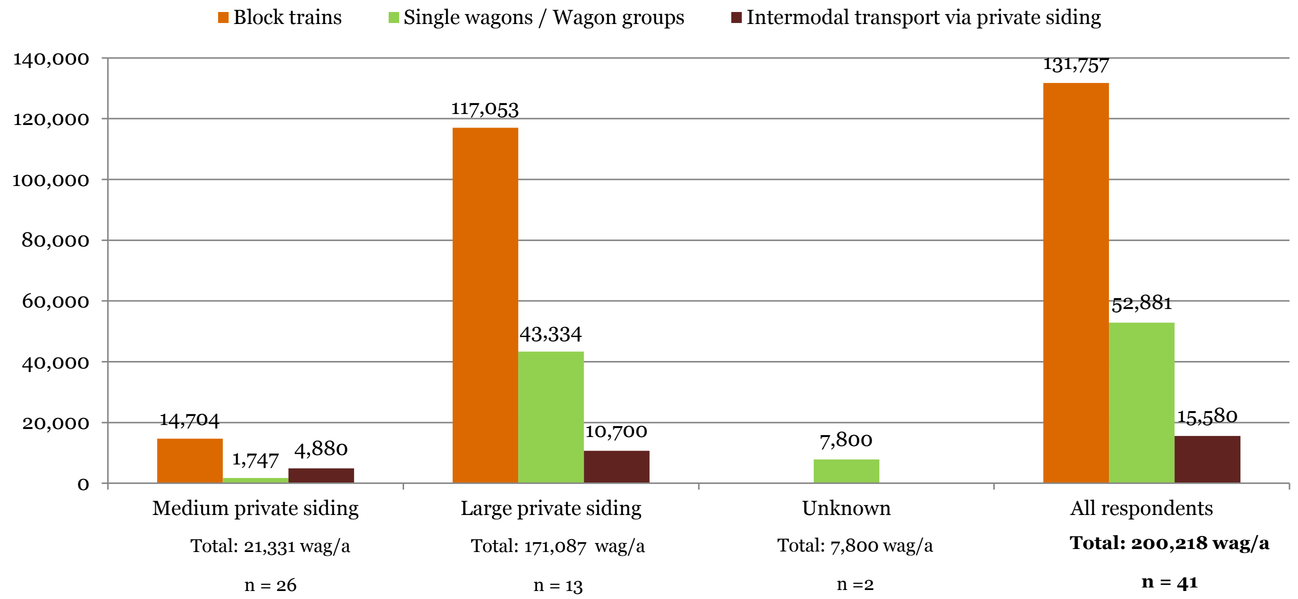
Figure 51 - Questionnaire 1: Annual transport volumes [t] by production system and industry branch (inbound + outbound)



Source: Hacon

Figure 51 and Figure 52 show the volume of the private sidings per wagon number. This question was answered by 41 (out of 44) participants, accounting for about 200.000 wagons per year (inbound + outbound). On average, this stands for about 4.900 wagons per siding and year or about 20 wagons per day (with 250 operating days per year). Connected with the average tonnage per siding (see above) this results in an average net weight of about 50 tonnes per wagons, a plausible figure keeping in mind the distinctive position of block trains and of products with a high specific weight (chemical/agriculture products).

Figure 52 - Questionnaire 1: Annual transport volumes [wagons] by production system and size class of siding (inbound + outbound)

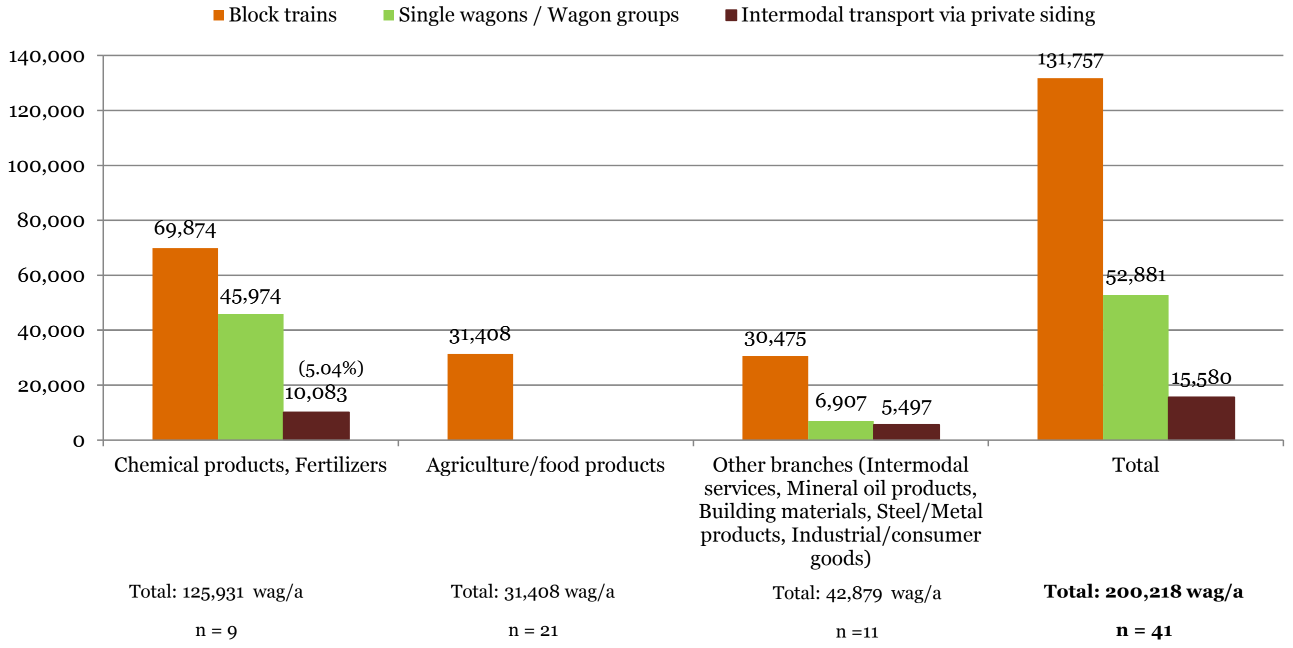


Source: HaCon

On principle, the figures confirm the main conclusions drawn from the tonne-based volume: a particularly high contribution of large sidings (siding type) and of block trains (production systems) to the total wagon number.

Again, chemical industry showed a remarkable high share of single wagon traffic, agricultural industry a total domination of block trains.

Figure 53 - Questionnaire 1: Annual transport volumes [wagons] by production system and industry branch (inbound + outbound)



Source: HaCon

The connection of infrastructure and volumes that are handled via this infrastructure provides specific volume figures per infrastructure unit. Such figures are of particular interest since they allow for combining statistical/ forecast volume figures with infrastructure equipment.

Table 37 shows such figures per industry branch, referring to the total track length of the sidings, their loading track length as well as to the number of switches. It must be stated clearly once again that these values must be treated carefully due to the small range of the sample.

Table 37 - Questionnaire 1: Specific volume per infrastructure unit

Industry branch	[t/a] per loading track meter	[t/a] per total track meter	[1,000 t/a] per switch
Chemical products/fertilizers	23	13	4
Agriculture/food products	347	130	38
All sample sidings	43	30	8

Source: HaCon

Nevertheless, these figures show a quite plausible picture. As already described within the use cases of industry specific last-mile infrastructure (chapter 4.3.3.4), chemical plants often show a complex rail layout with numerous, rather short loading tracks. This is reflected by the comparably low volumes figures per track and per switch. In contrast, private sidings for agriculture products are mostly designed for block trains and thus only need a simple rail configuration – in many cases just 1-2 switches and one long loading track. These correlations have also already been observed within the analysis of the sizes classes (chapter 4.3.4.4.2).

Next to the current volume, the participants were also asked about their short- and mid-term volume expectations. Table 38 compiles the results regarding the upcoming five years. The column "No of evaluated questionnaires" points out that apart from the agricultural sector (most companies belonging to two consortia) only few statements were made. Thus, the figures should be handled with particular care.

Under these circumstances, the companies from the agricultural branch expect a considerable, the chemical sector a moderate volume increase within the next years. Nearly all of this growth was assigned to block trains, only little to single wagon transport. Referring to the type of the sidings, large facilities seem to participate above average in the volume development. This would fit in the general trend of concentration to large sidings.

Regarding the volume expectations until 2030, the response was only very sporadic, some of the (few) answers also questionable. Thus, no result to the mid-term volume development can be provided.

Table 38 - Questionnaire 1: Expected volume growth within the next 5 years

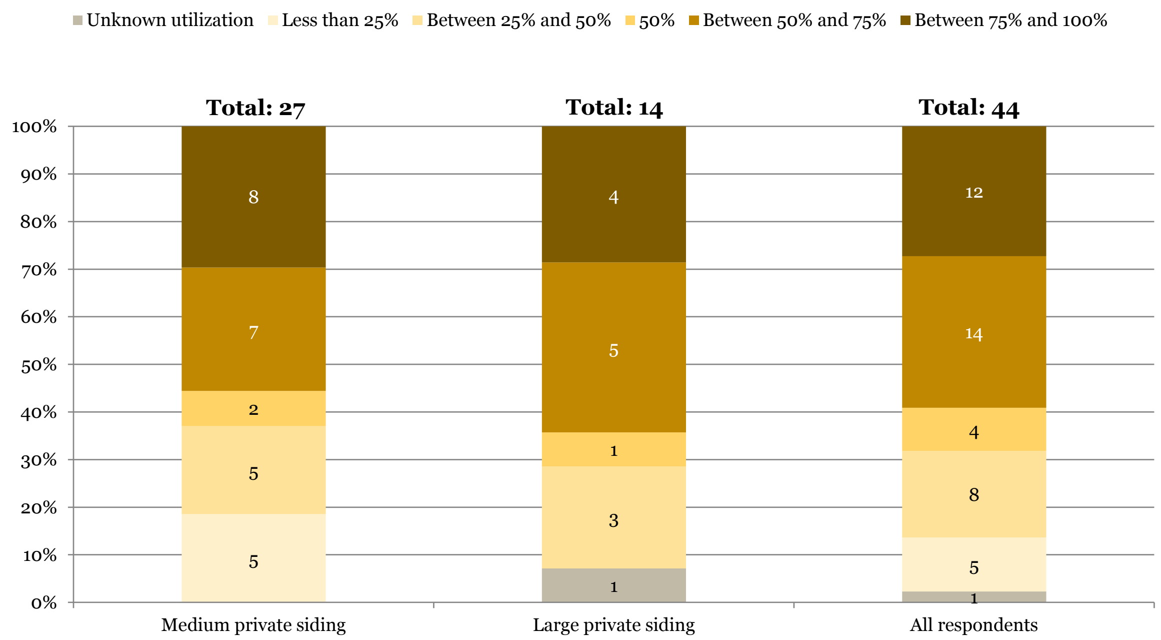
Industry branch	Expected total growth within the next 5 years	No of evaluated questionnaires
Chemical products/fertilizers	+10%	4
Agriculture/food products	+ 37%	20
Type of siding	**Expected total growth within the next 5 years**	**No of evaluated questionnaires**
Medium private sidings	+ 14%	20
Large private sidings	+ 26%	4

Source: HaCon

4.3.4.4.4. Capacity utilisation

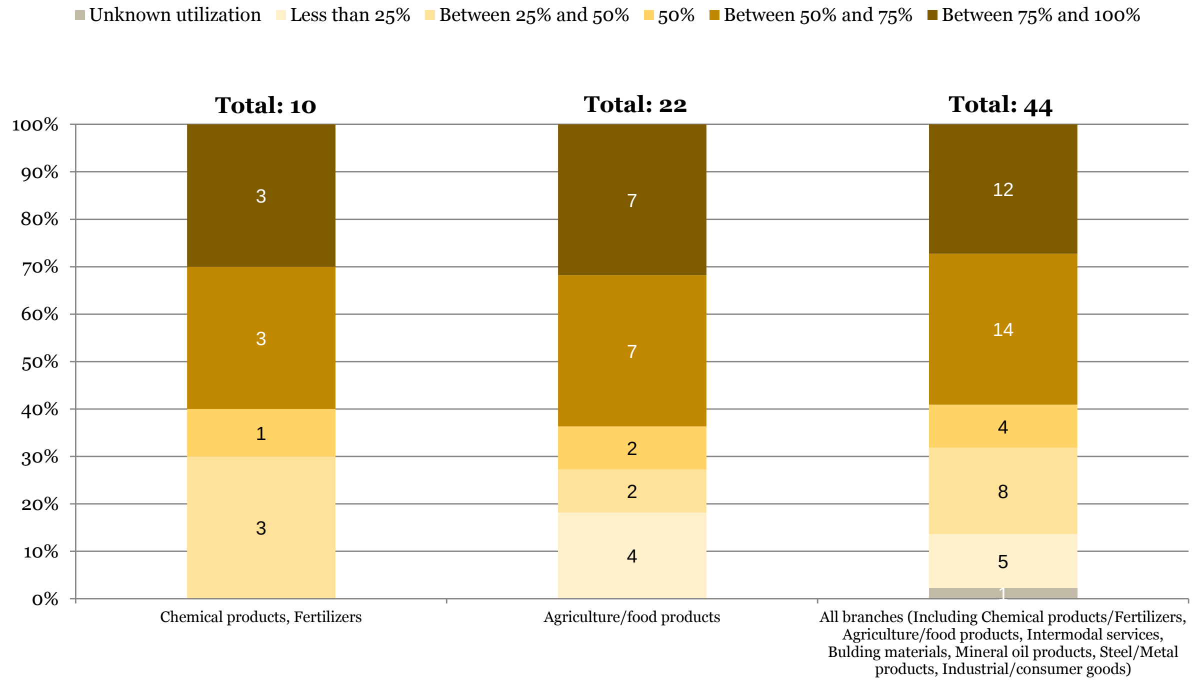
One important indicator for investment needs is the utilisation of the existing infrastructure. All 44 filled out private siding questionnaires answered the respective question. As Figure 54 and Figure 53 point out, about one-third of the private sidings is the range of more than 75% capacity utilisation, about 60% showed an utilisation rate of at least 50%. This is more or less valid for all size-classes and all industry branches.

Figure 54 - Questionnaire 1: Capacity utilization by size class of siding



Source: HaCon

Figure 55 - Questionnaire 1: Capacity utilization by industry branch

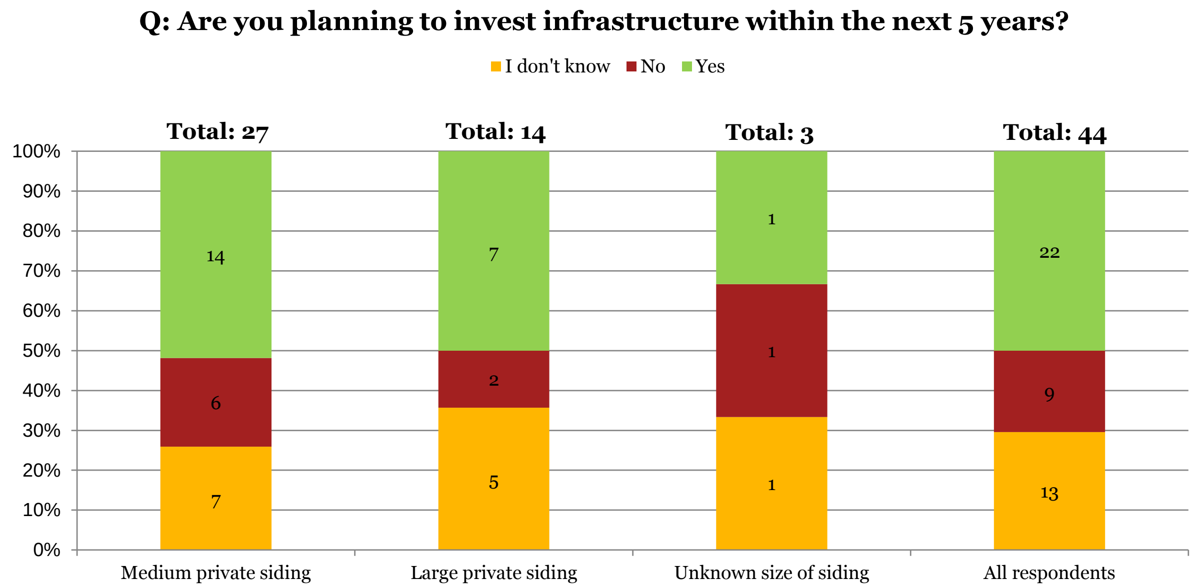


Source: HaCon

4.3.4.4.5. Planned investments in last-mile infrastructure

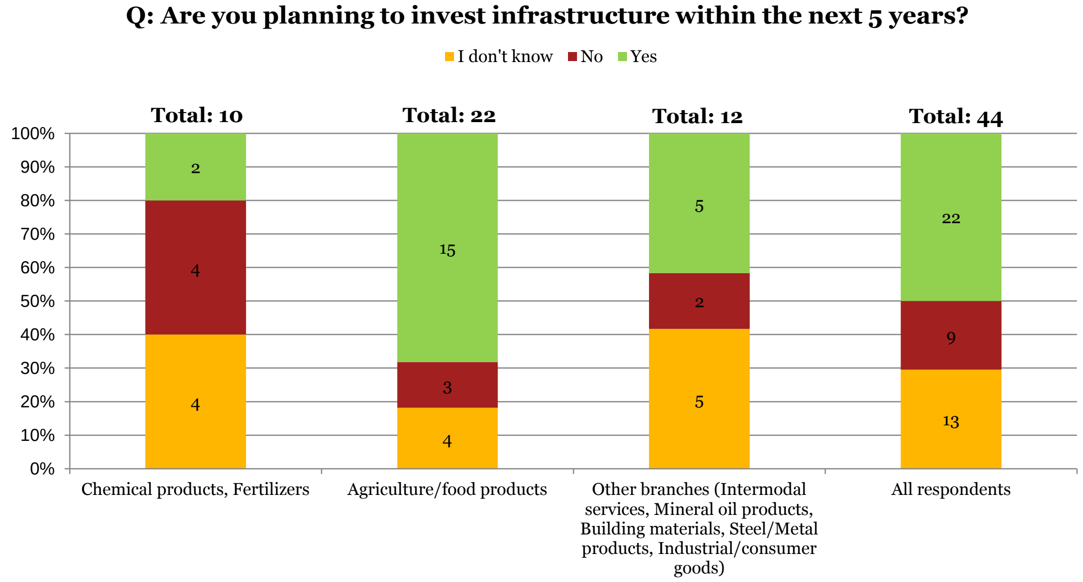
50% of the sample´s private sidings plan to invest in their last-mile infrastructure within the next five years. As Figure 54 points out, this applies for medium as well for large sidings. Figure 55 shows however a dedicated focus on the agriculture branch; this leads to the conclusion that the willingness to invest depends rather on the expected volume growth (compare Table 28) than on the maturity of existing infrastructure.

Figure 56 - Questionnaire 1: Willingness for investment in LMI by size class of siding



Source: HaCon

Figure 57 - Questionnaire 1: Willingness for investment in LMI by industry branch



Source: HaCon

This close connection between the expected volume development and investment willingness is confirmed by a closer look on the envisaged subjects of investments: in the majority of all cases this refers to facilities designed to increase performance/speed of loading and storage systems. The description of planned investments can be assigned to the following clusters:

- Loading/storage facilities: 13 sidings;
- General infrastructure improvement, e.g. additional switches, additional shunting tracks, layout optimisation: 5 sidings;
- General renewal/maintenance of rail infrastructure: 2 sidings;
- Others, e.g. management system, wagon-cleaning facility, weigh bridge: 3 sidings.

For these loading and infrastructure facilities, the 22 private siding owners plan to invest totally 65 Mio € in their last-mile infrastructure, respectively 3 Mio € on average per investment. As Table 39 visualises, the lion´s share of these investments is allotted to sidings of the chemical and agriculture industry, thereof about 20 Mio € solely for one large company. Funding of investments is intended only in two cases, one of them referring to a German funding scheme dedicated to improve infrastructure on regional level. For the second funding request (2.7 Mio €) no funding source was stated.

Table 39 - Questionnaire 1: Planned LMI investments by industrial branch

Industry branch	Yes	No	I don't know	Total amount of investment [Mio €]	Average amount of investment [Mio €]
Chemical products/fertilizers	2	4	4	30,3	15,2
Agriculture/food products	15	3	4	33,8	2,3
Intermodal services	1	1	3	0,4	0,4
Building materials	2	1	0	0,2	0,1
Mineral oil products	1	0	1	0,1	0,1
Steel/Metal products	1	0	0	0,2	0,2
Industrial/consumer goods	0	0	1	0	0

Industry branch	Yes	No	I don't know	Total amount of investment [Mio €]	Average amount of investment [Mio €]
Total	**22**	**9**	**13**	**65,0**	**3,0**

Source: HaCon

4.4. Deduction of infrastructure needs

4.4.1. Development of the European freight market 2030

4.4.1.1. Background and data sources

In order to calculate the future need on last-mile infrastructure and the resulting investments, dedicated forecast figures on the development of the rail freight market are needed. For this purpose, the first choice was to make use of existing prognosis data, represented by "official" forecasts of the European countries. Thus, respective studies, as far as publically available, have been analysed and checked against a requirement profile of criteria particularly relevant for the last-mile issue.

The result is displayed in Table 40. Totally, official forecasts for 12 countries have been examined. Additional harmonised forecast data on European level was available through the study on "EU Energy, Transport and GHG Emissions Trends". With view on the subject of the prognosis, the following main aspects have been used to check the forecasts regarding their suitability for the subsequent work steps:

- The forecasts must of course provide rail specific data. In order to comply with different types of last-mile infrastructure (private sidings, public sidings, railports and intermodal terminals) the overall rail data furthermore must allow a diversification into "intermodal" and "conventional" volumes.
- Preferably, although subordinated against the other criteria, the forecasts might also contain road and inland waterway data.
- The "unit of measurement" is of fundamental importance. Freight data is needed as transport volume [tonnes] and not as transport performance [tonne-kilometres], since [tonnes] is the basis to derive the "transhipment volumes" (see next bullet point) of last-mile infrastructure.
- The "transhipment volume" is the relevant unit to calculate the capacity (need) of transhipment points (compare the following chapter 4.4.1.2). For this purpose, the transport volumes must be broken down to "types of transport", i.e. domestic, international and transit volume figures.
- A disaggregation of the overall transport volumes regarding different commodities (preferably for each intermodal and conventional rail freight) allows for dedicated reference to the results of the market analysis (chapters 4.3.2. and 4.3.3.1), the rail freight production systems (chapter 4.3.3.2) and the logistic requirements of key industrial clusters (chapter 4.3.3.4).
- What concerns the time frame, the elaboration of the forecast study as well as the reference year of the prognosis should be as up-to-date as possible. For the time horizon, the year 2030 is preferred, as this complies with most current planning time frames for infrastructure (e.g. TEN-T corridors).

Table 40 – Analysed European freight forecasts

Country	Rail	Intermodal Conventional	Road	IWW	Type of transport (transit)	Commodities	Unit of measurement [t]	Reference year [2010-2015]	Time horizon [2030]
Austria	✓	-	✓	-	-	✓	✓	-	-
Belgium	✓	-	✓	✓	✓	-	-	✓	✓
Czech Republic	✓	-	✓	✓	-	-	-	✓	-

Country	Rail	Intermodal Conventional	Road	IWW	Type of transport (transit)	Commodities	Unit of measurement [t]	Reference year [2010-2015]	Time horizon [2030]
Finland	✓	-	-	-	-	✓	-	✓	✓
Germany	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hungary	✓	-	✓	-	-	-	-	✓	-
Netherlands	✓	-	-	-	✓	-	✓	-	✓
Romania	✓	-	✓	✓	-	✓	✓	✓	-
Spain	✓	-	-	-	-	✓	✓	-	-
Sweden	✓	-	-	-	-	✓	-	✓	✓
United Kingdom	✓	✓	-	-	-	-	✓	✓	-
Switzerland	✓	-	✓	✓	-	-	✓	-	✓
EU-28	✓	-	✓	✓	-	-	-	✓	✓

Source: HaCon

The analysis of studies has shown that only the Germany National Transport Plan prognosis largely fulfils the requirement profile. Main disadvantage of the other national forecasts was the missing specification regarding intermodal/conventional and domestic/international/transit rail freight. Furthermore, many studies show different classification systems for commodities (also not compatible with the Eurostat nomenclature) and they are based on different time-frames (for both the reference year and the forecast time horizon). Finally, almost all forecasts have used different framework conditions for the future development of the transport market; this means that results of the respective countries cannot simply be added.

In addition to the official forecasts of the listed countries, also the results of the TEN-T corridor studies and the Rail Freight Corridor implementation plans have been taken into account. However, they only show minor relevance for the last-mile issue, as they do not provide any transhipment figures for dedicated countries/ locations. They only refer to corridor related international transport flows and do not even consider domestic freight volumes. For these reasons, they have not been incorporated into the following work steps.

Concluding, it was decided to perform an own forecast for 2030 in order to elaborate a complete and consistent set of data suitable to conclude on the future capacity and investment needs of last-mile infrastructure. The methodical approach and resulting outcomes are described in the following chapters.

4.4.1.2. Methodology for the elaboration of last-mile infrastructure capacity needs

Based on the results of the analysis of the available forecasts, it has been decided by the consultancy consortium to perform an own forecast for 2030 in the framework of this study. It has to be noted that this forecast does not have an “official” character since it has been developed on pragmatic basis integrating available information and figures on most likely rail market developments:

- Fundament of the forecasting exercise is the study “EU Energy, Transport and GHG Emissions Trends to 2050 Reference Scenario 2013”, published in 2014, providing data for all Member States country-specific data for transport modes based on tonne-kilometres for different time horizons in five year steps from 2000 up to 2050.

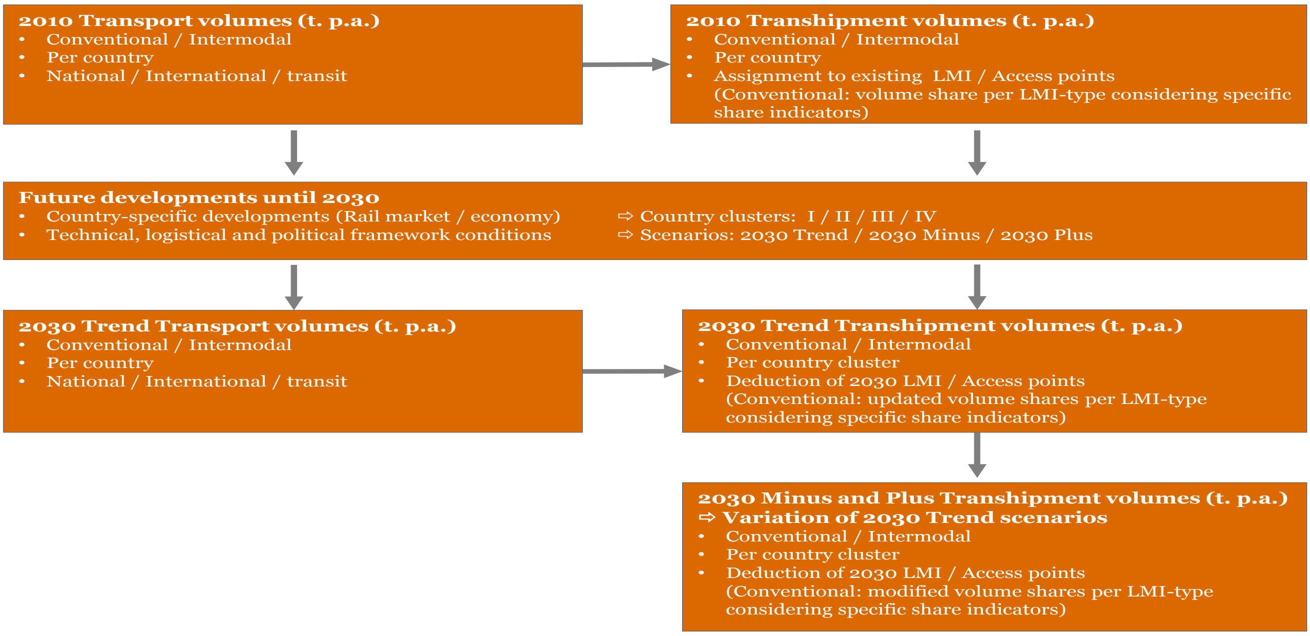
  As the above-mentioned study does not include differentiated information on the structure of the respective national rail freight markets, it was necessary to derive supplementing information from additional sources:

- Most important document was the German BVWP forecast “Prognose der deutschlandweiten Verkehrsverflechtungen“, published in 2014, as it contains all basic information necessary for the elaboration of future infrastructure needs: transport volumes [tonnes], tonne-kilometres, assignment to conventional and intermodal transport as well as structure on national, international and transit. As Germany is the most important rail freight market in Europe a) in terms of transport volumes market and b) due to its central location with interconnections to numerous European countries, it was assumed that the predicted structure and development of the future German rail freight market also will affect the European as well as other national markets. Consequently, assumptions and relevant trends have been considered.

- The “World Transport Reports” made by ProgTrans AG (Switzerland, 2014) providing additional information for the non-Member States Norway and Switzerland based on tonne-kilometres for 2030;
- For verification and validation of data the following sources have been used:
  - Available national country forecasts;
  - Results of the stakeholder consultation;
  - Trends and results of the transport market studies carried out in the framework of European Core Network Corridors studies, published in 2014;
  - Supplementary experts’ consultations on specific topic (e.g. intermodal transport);
  - The comprehensive analysis of the development of the rail freight and logistics market carried out in the framework of this study (cp. Chapter 4.3).
- The development of commodities has not been taken into account, as a solid database was not available due to the not common methodologies for commodity clustering in the European countries. The German forecast has not been taken, as the assumptions made are not transferable to the other countries.

For the elaboration of the forecast for the European rail freight market until 2030, the following methodology has been applied (cp. Figure 57).

Figure 58 - Methodology for the assessment of LMI-capacity needs



Source: HaCon

For the 2030 forecast and the deduction of the LMI capacity needs, the following working steps have been carried out:

- Reference year for the forecast was 2010, as for this year the most comprehensive structural data was available based on the German forecast. This study was providing detailed data for conventional rail freight (differentiated for block train and SWL), intermodal and also information on international transport volumes for neighbouring countries considering trade lanes affecting Germany (bilateral and transit flows).

For the other concerned countries, the respective 2010 data basis was taken from a comprehensive analysis of official Eurostat-data. This comprises country-specific data on the total rail freight market as well as type of rail freight (conventional, intermodal), tonnes, tonne-kilometres, average transport distances and the structuring regarding national, international and transit transport. The 2010 Eurostat database has been checked on plausibility and corrected, if necessary.

- Subsequently for 2010, the respective transhipment handling volumes per country had to be derived and, in a further step, assigned to the existing Access Points for intermodal and conventional rail freight. The following methodology has been applied:
  - National transport volumes have to be handled twice via APs per country. Consequently, these volumes have to be doubled for the calculation of LMI-capacity needs;
  - International transport volumes require only one handling per country;
  - Transit transport volumes were not considered because they induce no last-mile handling in the transiting countries (note: transit figures are already included in the international transport volumes of the respective sending or receiving countries).
  - For the assignment of conventional rail freight handling volumes to the respective type of Access Point, no statistical basis was available. Hence, this exercise has been carried out based on the infrastructure analysis for LMI infrastructure in Europe (cp.Table 15) considering specific volume shares per LMI-type. They have been defined based on market developments reflecting trends of the past decades: for private sidings the abandoning of in particular small and medium-sized facilities, a constantly decreasing importance of public sidings and an increasing number of railports. The elaborated structure for 2010 provides one of the fundaments for the elaboration of the 2030 framework conditions for LMI infrastructure.
- As for 2030, the GHG study provides country-related values only on tonne-kilometres for the total rail freight market it was necessary to transfer these numbers into transport volumes [tonnes] per country. This was carried out by analysing the German forecast regarding the 2010 and 2030 tonne-kilometres values and the deduction of trends for the development of tonne-kilometres by 2030. These elaborated trends were validated by the consultation of experts regarding the transferability to the concerned countries. Based on the results, the tonne-kilometres values per country for the respective domestic rail freight markets have been transformed into total rail transport volumes per country for 2030. The country specific values on total transport volumes for 2030 have been separated into a) conventional rail freight (relevant for Private sidings, Station with public siding and Railports) and intermodal transport (relevant for intermodal terminals) and b) structured into national, international and transit volumes. This forecast on transport volumes was the basis for the further working steps and represents the 2030 Trend scenario as described below.
- For the elaboration of the most-likely evolution of the 2030 LMI framework conditions, two development paths have been considered. The first comprises of a deeper consideration of the recent structure of the respective national rail freight markets and their most likely development until 2030. In order to consider country-specific developments in an adequate scope, the concerned countries have been assigned into reasonable clusters considering the following aspects:
  - Economic framework conditions;
  - Structure of national rail freight: development rail production systems and last-mile infrastructure.

Country Cluster I includes eight countries, namely Austria, Belgium, Germany, Finland, Luxembourg, Netherlands, Sweden and Switzerland. In general, all these countries represent economies in which **rail freight today has and in the future will have an important role**. Single wagonload is in an ongoing restructuring process that has progressed country-wise in varying degrees:

- Single wagonload transport volumes are constantly decreasing but will remain viable until 2030;
- Freight volumes handled via small and medium-sized sidings are constantly decreasing or even have been abandoned.

Consequently, this process leads to a reduction of small and medium-sized private sidings. The number of railports will increase offering an alternative for closed private sidings but also for public sidings which already today have a minor importance as they are often used for the transhipment of seasonal products (in particular lock wood). For the future, it is assumed that incumbent railway undertakings will increasingly lose their interest to serve public sidings.

Country Cluster II includes the following eight countries: Denmark, France, Ireland, Italy, Norway, Portugal, United Kingdom and Spain. Regarding their economic structure and economic efficiency, these countries are similar to country cluster I. Based on the current situation of SWL for instance in Italy and France, it is assumed that this type of rail freight services will remain with a minor market share in 2030. In country cluster II, the trend regarding the substitution of public sidings by Railports will be even stronger.

Country Cluster III includes Czech Republic, Hungary, Poland and Slovakia. These countries, all EU Member States since 2004, have gone through a process of adaptation of their economy since the opening of the “iron curtain”. Former industry locations have been restructured or even closed; new factories and distributions centres have developed. Rail transport has decreased in the past years, but single wagonload will still play an important role in 2030. Regarding last mile infrastructure, a consolidation process for the adaptation to market needs is predicted. The still existing large number of public siding and small private sidings will be significantly reduced until 2030. Railports will take over part of their functions.

Country Cluster IV includes Bulgaria, Croatia, Estonia, Greece, Latvia, Lithuania and Slovenia and Romania. In contrast to country cluster III, these Eastern European countries are still in an ongoing process of restructuring their industries and related rail infrastructures. An important trend is that the still existing very high number of public siding in these countries will be significantly reduced (very low/no demand which does not justify maintenance or renewal costs). The settlement of new rail-affine industries will lead to a disproportionately increase of Railports.

The country clusters described above defined the basis for the deduction of the 2030 rail freight market. In order to estimate and quantify the impact of additional anticipated future trends, the following scenarios have been considered:

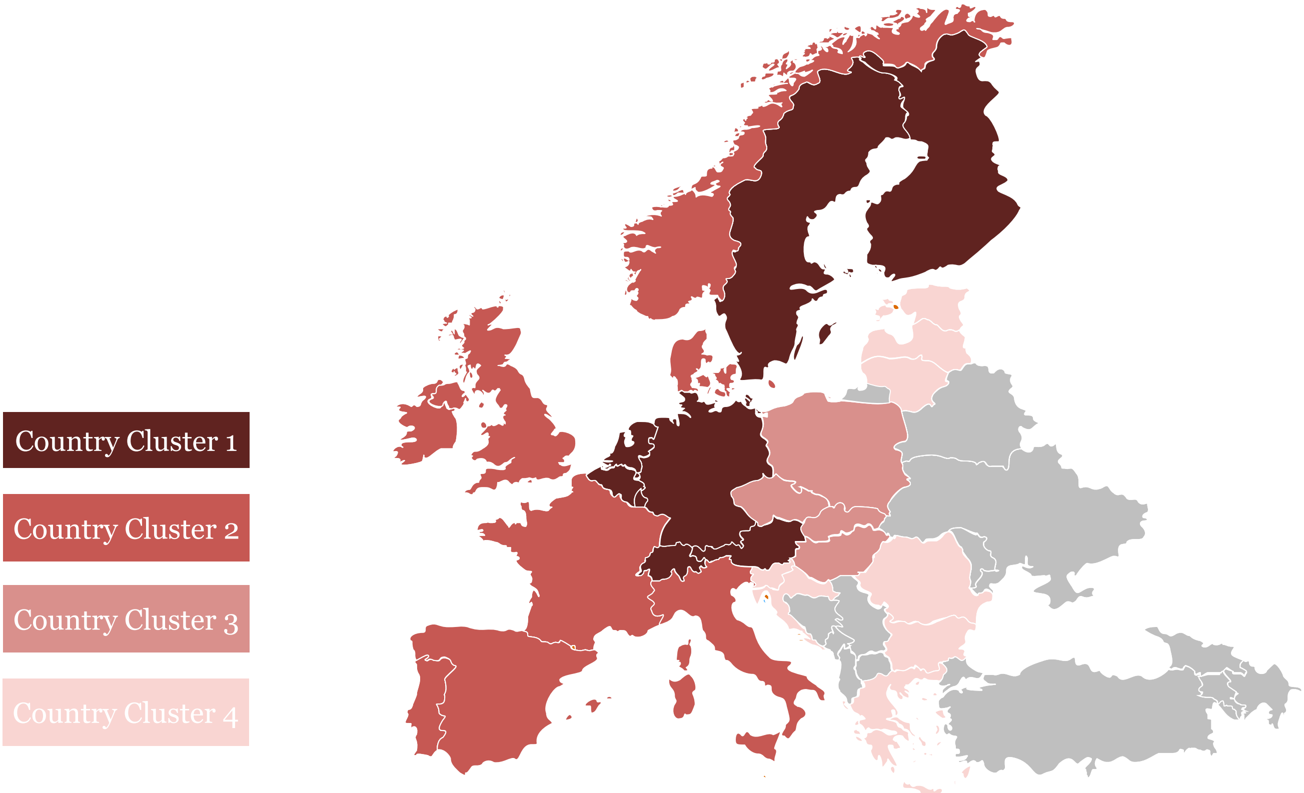
- “Trend 2030” scenario: considers the assumptions made for the four country clusters;
- “Minus 2030” scenario: considers unfavourable framework conditions for rail freight compared to the 2030 Trend scenario;
- “Plus 2030” scenario: expects improved framework conditions for rail freight compared to the 2030 Trend scenario.

For the definition of the scenarios, the following parameters have been applied:

- Different impact levels on European, national and regional by transport policy;
- Different framework conditions for funding of LMI-infrastructure;
- Different assumptions for the future of SWL in Europe, different levels of integration of advanced rail production systems and LMI-relevant technical improvements;
- Different framework conditions for competition between rail and road transport.

In the following map, a geographical representation of each cluster is reported:

Figure 59 - Country Clusters



An overview on the parameters applied for the definition of the scenarios and their most likely related effects is compiled in the following Table 41.

Table 41 – Parameters for the definition of 2030 scenarios

Parameter	2030 Trend	2030 Minus	2030 Plus
Pan-European transport policy	Technical standards according TEN-T and Rail Freight Corridors by 2030	*Same as in 2030 Trend scenario*	*Same as in 2030 Trend scenario*
National transport policy	No dedicated LMI concepts except funding	*Same as in 2030 Trend scenario*	• Concepts for dedicated levels of area-wide access to rail freight transport • Systematic replacement of abandoned private and public sidings by Railports
Regional transport policy	No dedicated concepts to include LMI into spatial planning	• No dedicated concepts to include LMI into spatial planning • Framework conditions favour prevention/delay of LMI construction/upgrade	Spatial planning: • fosters LMIs in industrial zones • facilitates construction of LMI in agglomerations
Funding policy	No significant difference to current practices	Concentration of upgrade measures in large APs	Funding policy in line with concepts for area-wide access to rail freight: • inclusion of Railports • dedicated funding for preservation of mid-sized

Parameter	2030 Trend	2030 Minus	2030 Plus
			APs
Rail production system to LMI	Conventional and Intermodal: • Merging of production systems Conventional: • Remaining SWL will reduce train composing levels • Further integration of SWL into European networks • Liner train systems with wagon exchange in dedicated hubs (new market entrants)	Conventional: • Abandoning of SWL networks in European countries • Incumbent RU and new entrants concentrate on block trains	Conventional: • General survival of existing SWL-network with moderate concentration • Optimised SWL services supported by advanced concepts (hybrid locos, standardised wagons with flexible loading platform, SWISS-split system)
	Intermodal: Hub and gateway connections on main trade lanes	Intermodal: Concentration on direct and shuttle trains	Intermodal: Additional exploitation of volumes by area-wide access to high quality intermodal transport services (e.g. additional liner systems)
Performance and layout of Intermodal terminals	Ongoing standardisation and automation of terminals	*Same as in 2030 Trend scenario*	Industrialised terminal layouts and processes (direct train arrival and departure, avoiding of shunting, high degree of automation)
Cost situation for rail transport providers	Cost pressure leads to • increase of large-scale LMI • abandoning of many small and some mid-sized APs	Expanded cost pressure leads to • concentration on large APs • increased abandoning of many small and mid-sized APs	Reduced cost pressure leads to better framework conditions for survival of small / mid-sized APs, but: trend to large APs ongoing
Competition situation to road (transport time, frequency, reliability, costs)	Conventional: Slight increase of quality parameters for remaining SWL transports due to reduction of APs (for main transport axes)	Conventional: *Same as in 2030 Trend scenario*	Conventional: • Increasing number of Railports enables mixture of intermodal and conventional trains (replace former SWL transport chains by direct trains) • Improvement of SWL operation on the last-mile
	Intermodal: Increase of quality parameters on main transport axes, but: discrepancy between main axis and other regions	Intermodal: Increase of quality parameters on main transport axes, but: stronger discrepancy between other regions axis and other regions	Intermodal: Increase of quality parameters on main transport axes - difference between main axes and other regions is getting smaller

Source: HaCon

The following enumeration highlights the general assumptions made and effects for the related development of Last-mile infrastructure:

- For the Trend scenario: framework conditions as described in the definition of the country clusters (see above) leading to an increase of large-scale LMI, an abandoning of many small and some mid-sized APs. Public sidings will lose their importance. Railports will substitute closed private as well as public sidings.
- For the Minus scenario (compared to Trend): a higher concentration on large private sidings and an above average abandoning of small- and mid-sized public sidings. Public sidings will significantly lose their importance.
- For the Plus scenario (compared to Trend): Ongoing trend to large private siding but also an above average "survival" of small- and mid-sized public sidings.

For intermodal transport in all three scenarios: the "terminal landscape" will not significantly change until 2030: trade lanes and today's terminal locations will remain, increase of transhipment volumes and necessary capacity expansions will be primarily ensured by upgrading and replacement of existent terminal facilities.

- The 2030 Trend transport volumes have been transferred into transhipment volumes per country and country cluster according the methodology applied for 2010 using adapted/updated specific volume share per LMI type. Transhipment volumes have been elaborated in a first step for the 2030 Trend scenario and subsequently for the 2030 Minus and 2030 Plus scenarios considering the different framework conditions for LMI infrastructure.

4.4.2. Development of transhipment volumes 2010-2030

This chapter describes the results of the assessment of transhipment volumes differentiated to conventional and intermodal rail freight between 2010 and 2030 considering the different forecast scenarios.

As stated in the description of the applied forecast methodology, the elaborated 2030 transhipment values are based on generalised forecast data because for most of the concerned countries no "official" values were available. Therefore, the presentation of the results of the evaluation of capacity needs and the related development of Access Points for the three scenarios is carried out by showing aggregated values for all 28 countries (EU 28 including Norway and Switzerland). The presentation of detailed country or country cluster values could lead to misinterpretation because specific national developments with effects on the rail freight market cannot be considered in this approach sufficiently.

As described in chapter 4.4.1.1, 2010 was chosen as reference year for the forecast, since for this year the most comprehensive information were available. Transhipment volumes have been forecasted for conventional rail freight differentiated by Private siding, Stations with public sidings, Railports and Intermodal transport via terminals. Table 42 summarises the elaborated transhipment volumes considering the three scenarios.

According to the defined parameters, the 2030 scenarios differ significantly (cp. Also Table 31). Compared to the 2030 Trend scenario, the

- 2030 Minus scenario predicts a substantially decrease of conventional volume of -20% and a slight decline of intermodal volume by -5% for 2030 which leads to an overall loss of -17%;
- 2030 Plus Scenario considers a moderately growth of +5% for conventional volume whereas intermodal transhipment is expected to increase by -20%. This leads to an overall volume increase of +8% based on the Trend scenario.

Table 42 – Summary of transhipment volumes for the concerned countries

EU28+2	2010 [Mio t/a]	2030 Trend		2030 Minus			2030 Plus		
		[Mio t/a]	Δ to 2010	[Mio t/a]	Δ to 2010	Δ to 2030 T	[Mio t/a]	Δ to 2010	Δ to 2030 T

EU28+2		2010 [Mio t/a]	2030 Trend		2030 Minus			2030 Plus		
			[Mio t/a]	Δ to 2010	[Mio t/a]	Δ to 2010	Δ to 2030 T	[Mio t/a]	Δ to 2010	Δ to 2030 T
I.	Transhipment volume via conventional AP	2.210	2.432	10%	1.945	-12%	-20%	2.553	16%	5%
II.	Transhipment volume via Intermodal terminals	278	527	89%	500	80%	-5%	632	127%	20%
Total transhipment volume		**2.488**	**2.958**	**19%**	**2.446**	**-2%**	**-17%**	**3.185**	**28%**	**8%**

Source HaCon

- In 2010, the total rail transhipment volume amounts to some 2,5 billion tonnes. With about 2,21 billion tonnes the lion's share (89%) is allotted to conventional Access Point whereas Intermodal Terminals handled about 0.28 billion tonnes (11%).
- Based on 2010, an increase of 19% to 2.96 billion tonnes (plus 0.470 billion tonnes) for the 2030 **Trend scenario** is predicted. While transhipment via conventional Access Points will grow by only 10%, the volume handled via Intermodal terminals will strongly expand by 89% (plus 0.25 billion tonnes) and is contributing with 53% to the total increase of 0.470 billion tonnes in this scenario.
- Compared to the 2010 values, the **Minus Scenario** is resulting in a slight increase of 2% based on the total transhipment volume. Looking at the structure, it becomes obvious that the decrease is in particular triggered by the significant decline of 0.265 billion tonnes for transhipment via conventional Access points. These large losses will almost be compensated by the high growth of intermodal volume which is forecasted to raise by 0.222 billion tonnes (plus 80%).
- Compared to the 2010 values, the framework conditions of the **Plus Scenario** will lead to an increase of the total volume by almost 0.7 billion tonnes (plus 28%). In particular intermodal will significantly increase by 127% and contributes with additional 0.35 billion tonnes a share of 50% to the predicted volume growth.

4.4.3. Development of Access Points 2015-2030

Based on the elaboration of transhipment volumes for the three scenarios, the deduction of Access Points for conventional and intermodal transhipment has been carried out. Starting point of this exercise was the examined existing last-mile infrastructure for 2015 in the concerned countries.

- For the 2030 **Trend scenario**, in total ~16,200 APs for rail freight have been calculated. Based on the 2015 figures, this leads to an overall reduction of -27%. This is in particular related to **Stations with public sidings, decreasing significantly by -59%** (-3,293 APs), and **Private sidings which will be reduced** by -19% (-3,013 APs). At the same time, the number of Railports will considerably grow by 173% (+327 facilities). For the Trend scenario, the figures of Intermodal terminals will only slightly increase by 5% (+37 facilities) assuming that the structure of the European intermodal market will not change noticeable.
- The 2030 **Minus scenario** results in a significant decline of AP by almost -50% based on the 2015 numbers. Compared to the Trend scenario, with -30% the number of LMI facilities is considerably lower: the number of Private sidings will be reduced by -29% (-3,606 APs), Stations with Public sidings by -52% (1,205 APs) and Railports by -18% (94 APs). Assuming the same framework conditions for

intermodal transport as in the Trend scenario, for intermodal terminals only a slight reduction of -2% (19 APs) has to be recorded.

- The 2030 **Plus scenario** results in a decline of AP of -20% based on the 2015 overall figures. In relation to the Trend scenario, the 2030 Plus scenario requires for 10% more LMI facilities. According to the defined assumptions for this scenario, the number of Private sidings will be +12% higher (1,456 APs), Railports in a range +14% (72 APs) whereas the number of Stations with public siding will not change. This indicates that public sidings will not benefit from the predicted increasing transhipment volumes in this scenario. They will be handled via the increasing number of Railports and Private sidings. For intermodal terminals the number of will increase by 5% (36 facilities).

The overall results of the calculation are summarised in the following Table 43.

Table 43 – Development of Access Points 2015 - 2030

EU28+2		2015	2030 Trend		2030 Minus			2030 Plus		
				Δ to 2015		Δ to 2015	Δ to 2030 T		Δ to 2015	Δ to 2030 T
I.	**Conventional Access Points total**	**21.412**	**15.433**	**-28%**	**10.528**	**-51%**	**-32%**	**16.961**	**-21%**	**10%**
	- Private sidings	15.613	12.600	-19%	8.994	-42$	-29%	14.056	-10%	12%
	- Stations with public sidings	5.610	2.317	-59%	1.112	-80%	-52%	2.317	-59%	0%
	- Railports	189	516	173%	422	123%	-18%	588	211%	14%
II.	**Intermodal terminals**	**730**	**767**	**5%**	**748**	**2%**	**-2%**	**803**	**10%**	**5%**
All rail freight access points		**22.142**	**16.199**	**-27%**	**11.276**	**-30%**	**-30%**	**17.764**	**-20%**	**10%**

Source HaCon

4.5. Deduction of investment needs

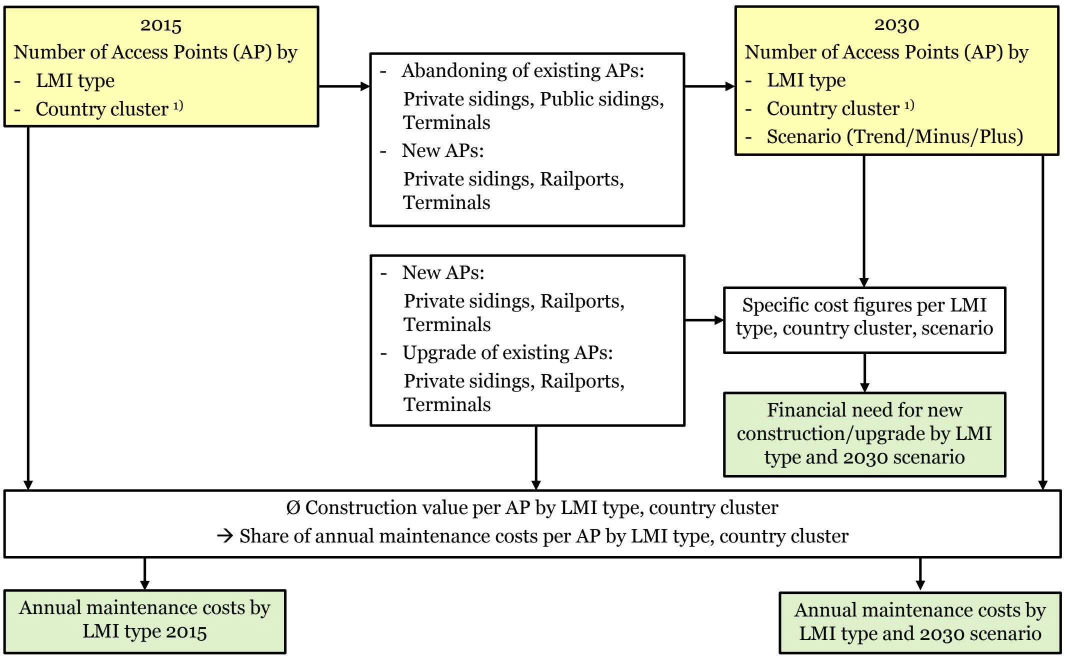
Based on the volume assessment for the three scenarios 2030, the investment needs have been calculated. Initially, it has to be stated that the existing data basis for LMI investment figures is only poor; the same applies for an approved methodology. The model that has been set up within this study therefore must replace those missing data by assumptions. These assumptions (specific cost figures, need for upgrade and/or new construction, value of facilities etc.) have been derived from long-time experience of the consulting and from exploiting available data sources. In this context, the following studies shall be named explicitly:

- HaCon/KombiConsult: "Evaluation of the funding rules for rail sidings in Germany"; expertise for the German Ministry of Transport, Building and Urban Affairs; Hannover, Frankfurt/Main 2011
- HaCon/KombiConsult: "Evaluation of the funding programme for intermodal terminals in Germany 2014"; expertise for the German Ministry of Transport and Digital Infrastructure; Hannover, Frankfurt/Main 2014

Additionally, the deduced input data as well as the results have been intensively discussed within expert workshops. Thus, the data set as well as the overall outcome can be regarded as plausible providing indications of investment needs, but no detailed figures. Those detailed figures could be derived from the model calculations theoretically; however, they would only pretend to be more accurate; actually, they would infringe the "law of large numbers" and therefore lead to implausible results in detail. For this reason, only aggregated results of the investment need calculations are displayed in the following chapters. They are differentiated regarding LMI type (Private sidings, Stations with public sidings, Intermodal terminals, Railports) and related to the three volume scenarios in order to refer to different approaches for funding schemes, but are not broken down to country specific figures.

Figure 59 shows the structure of the model that has been set up for the calculation of investment needs. It delivers two kinds of results: (1) the financial need for LMI new construction/upgrade and (2) the expected annual costs for LMI maintenance. Both results directly depend on the existing infrastructure (status 2015, compare chapter 4.2.1) and on the infrastructure needs for 2030 (compare chapter 4.4). Between these two time horizons, a linear development has been assumed. This applies for the infrastructure as well as for the financial needs.

Figure 60 – Model structure for investment need calculation



[1] Only for Private sidings, Stations with public sidings, Railports

Source: HaCon

4.5.1. Financial need for LMI new construction and upgrade

The principle way to transfer the number of LMI Access Points (outcome of chapter 4.4.3) into investment needs follows the scheme visualised in Figure 57:

- Identification of the number of required new-built Access Points. Generally, this number is calculated as the difference between the required Access Points 2030 and the existing Access Points 2015 (see Table 33). The number of existing Access Points must furthermore be reduced by those facilities that will be abandoned between 2015 and 2030.

  → Assignment of specific cost figures for new construction.

  → Calculation of total investment needs for new construction by multiplying the number of new-built Access Points with the respective specific cost figures.

- Identification of the number of Access Points to be upgraded. The basis figure is the number of required Access Points 2030 (see Table 33) without the new-built facilities (see above).

  → Assignment of specific cost figures for upgrade measures.

  → Calculation of total investment for upgrade measures needs by multiplying the number of Access Points to be upgraded with the respective specific cost figures.

The input values for this calculation have been differentiated by LMI type, country cluster and scenario.

For the **Trend scenario,** the following assumptions have been made:

- 30% of the existing Private sidings will be abandoned until 2030; mostly small, but also some middle-sized facilities are concerned. The number of new Private sidings is calculated for each country cluster as the difference between the target figures 2030 and the remaining 2015 (i.e. minus abandoned) facilities.

  10% of all Private sidings in 2030 (except the new ones) will be upgraded until 2030. Each 50% of these upgrading cases refer to either replacement of existing equipment or to expansion of the siding.

  The average invest for new private sidings was calculated with 2.5 Mio EUR for country cluster I. For cluster II, this figure as reduced by 10%, as sidings in these countries are expected to show a more simplified (block train compatible) layout. For cluster III and IV the specific invest was reduced by 30%/50% due to lower cost structures in these countries compared to cluster I.

  For each upgrading measure, 1.5 Mio EUR was calculated for country cluster I. The costs for the other clusters were reduced in the same way as for new constructions.

- The number of Stations with public sidings will be reduced to the target figure in each country cluster. As this kind of last-mile infrastructure does not correspond to the logistic requirements of the future, no new public sidings will be implemented until 2030.

  Stations with public sidings will not receive any upgrading measures.

- Railports are designed to replace abandoned private/public sidings and offer additional conventional and intermodal services; furthermore, these facilities are of rather low current age. Thus, it is assumed that all currently existing Railports will be in operation until 2030; therefore, none of these facilities will be abandoned; the number will be increased until reaching the 2030 target figure in each country cluster.

  In order to cope with rising logistic requirements and volumes, 25% of all Railports in 2030 (except the new ones) will be upgraded until 2030. Each 50% of these upgrading cases refer to either replacement of existing equipment or to expansion measures.

  For new Railports, an average invest of 7.5 Mio EUR was calculated for country cluster I and II. In the countries of clusters III and IV it is expected that smaller facilities will be required according to the respective volume development. Considering the lower cost structure in these countries as well, the cost figure was reduced by 10%/20%.

Upgrade measure for Railports were calculated by each 2 Mio EUR in country cluster I, reduced by 10%/30%/50% for the clusters II/III/IV.

- As already explained in chapter 4.4, the total number Intermodal terminals is expected to increase only moderately until 2030. Thus, the lion´s share of the volume growth must be performed via upgrade and modernisation measures of existing facilities. It is assumed that no action is required for 40% of all currently existing terminals, since their technical equipment will remain state-of-the-art and their technical life span will not have been reached until 2030. Conversely, the majority of terminals needs to be upgraded: in 90% of these cases, upgrading means expansion of existing facilities and renewal of technical equipment. The number of new terminals is then calculated as the total target figure 2030 less the number of terminal without need for action less the number of upgraded terminals.

  The average invest for new terminal construction was calculated by 230 EUR per loading unit (LU). For upgrading measures, this figure was reduced by 25%.

Compared to the Trend scenario, the **Minus scenario** is characterised by a significant volume decrease, especially in the conventional market sector. It is assumed that this development goes along with a strong focus on large last-mile facilities. Consequently, the assumptions of the Trend scenario were adjusted as follows:

- The share of existing Private sidings that will be abandoned until 2030 increases from 30% to 50%. This concerns not only small, but also numerous middle-sized facilities. Cost figures for new construction and upgrade remain unchanged, since large industrial companies already make use of a Private siding and investments in new construction of small sidings are unlikely to occur in this scenario.
- In contrast, it is expected that new construction of Railports will concentrate on fewer, but larger facilities. This is considered by increasing the average invest for new construction and for upgrade of Railports by 20% compared to the Trend scenario.
- Investment and upgrade costs of Intermodal terminals directly depend on the transhipment volume; thus, no adjustment of the calculation parameters is necessary.

The **Plus Scenario** shows a considerable volume increase compared to the Trend case. Political framework conditions will favour the survival and establishment particularly of middle-sized facilities. Hence, the following modifications were incorporated into the parameters for investment calculation (compared to the Trend scenario):

- The share of existing Private sidings that will be abandoned until 2030 decreases from 30% to 25%. Due to the fact that new construction and upgrade of Private sidings will also refer to middle sized facilities, the average invest figures of the Trend scenario are reduced by 25%.
- A similar development also applies for the Railports. The invest figures for new construction and upgrade measure are thus reduced by each 10% compared to the Trend scenario.
- Investment and upgrade costs of Intermodal terminals directly depend on the transhipment volume; thus, no adjustment of the calculation parameters is necessary.

The most important of these assumptions and input figures are compiled in Table 44 and Table 45. They represent basic figures of the model. Whenever dedicated (e.g. country specific) values were available, these have been used instead.

Table 44 – Main input figures for calculation of new and upgraded facilities 2030

	Private sidings	Public sidings	Railports	Intermodal terminals
Abandoning of existing LMI until 2030	• Trend: -30% • Minus: -50% • Plus: -25%	To respective target figure 2030	---	• No action required for 40% of existing terminals • 60% of existing terminal locations to be upgraded. • Thereof 90% expansion of existing facilities and renewal of technical equipment. • New terminals = target figure 2030 • less number of terminal without need for action • less number of upgraded terminals.
New-built LMI until 2030	To respective target figure 2030	---	To respective target figure 2030	
LMI to be upgraded until 2030	• 10% of 2030 facilities (except new-built) • Thereof each 50% replacement of existing equipment/ expansion of the siding	---	• 25% of 2030 facilities (except new-built) • Thereof each 50% replacement of existing equipment/ expansion of the siding	

Source: HaCon

Table 45 – Main input figures for investment need calculation

	Private sidings	Public sidings	Railports	Intermodal terminals
Specific invest needs for new facilities				
Country cluster I	• Trend: 2.5 Mio EUR • Minus: as Trend • Plus: Trend -25%	---	• Trend: 7.5 Mio EUR • Minus: Trend +20% • Plus: Trend -10%	230 EUR/LU
Country cluster II (compared to cluster I)	-10%	---	+/- 0%	
Country cluster III (compared to cluster I)	-30%	---	-10%	
Country cluster IV (compared to cluster I)	-50%	---	-20%	
Specific invest needs for upgraded facilities				
Country cluster I	• Trend: 1.5 Mio EUR • Minus: as Trend • Plus: Trend -25%	---	• Trend: 2.0 Mio EUR • Minus: Trend +20% • Plus: Trend -10%	-25% compared to new construction
Country cluster II (compared to cluster I)	-10%	---	-10%	
Country cluster III	-30%	---	-30%	

(compared to cluster I)			
Country cluster IV (compared to cluster I)	-50%	---	-50%

Source: HaCon

The overall results of the described model calculations are displayed in Table 46. The figures include all costs for infrastructure and transhipment equipment on the respective facility´s area as far as necessary for the rail access. In contrast, storehouses and other superstructure are not considered. All figures refer to costs/ prices of 2015, without any balancing of inflation until 2030.

Table 46 – Investment needs for LMI new construction and upgrade

EU28+2		2015 [Mio €]	2030 Trend		2030 Minus			2030 Plus		
			[Mio €]	Δ to 2015	[Mio €]	Δ to 2015	Δ to 2030 T	[Mio €]	Δ to 2015	Δ to 2030 T
I.	**Conventional Access Points total**	-	**5.274**	-	**4.541**	-	**-14%**	**5.636**	-	**7%**
-	Private sidings	-	2.857	-	2.458	-	-14%	2.944	-	5%
-	Stations with public sidings	-	0	-	0	-	-	0	-	-
-	Railports	-	2.417	-	2.083	-	-14%	2.642	-	9%
II.	**Intermodal terminals**	-	**4.449**	-	**4.405**	-	**-1%**	**5.603**	-	**26$**
All rail freight access points		-	**9.723**	-	**8.947**	-	**-8%**	**11.239**	-	**16%**

Source: HaCon

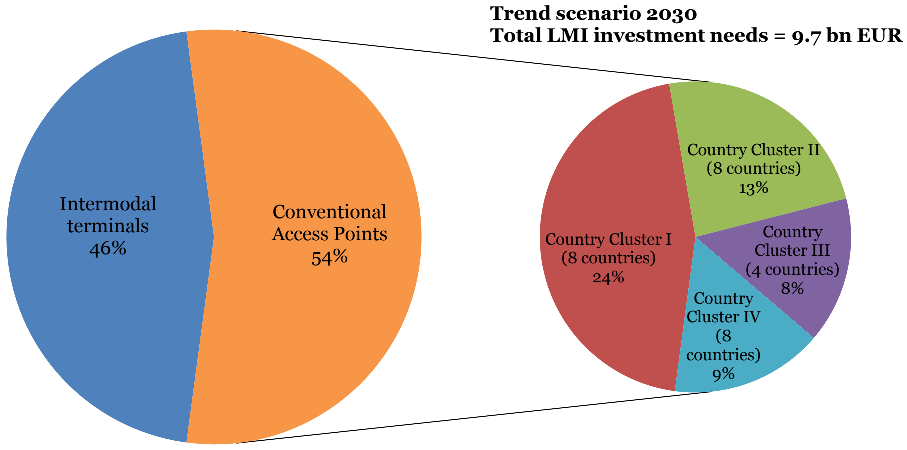
- In total, new construction and upgrade of last-mile infrastructure in Europe will request some 9.7 billion EUR in the 2030 **Trend scenario** compared to the 2015 status. This means an average investment need of 20-25 Mio EUR per year and country.

  46% of this total investment need is allotted to Intermodal terminals (see Figure 59). Assuming that the Railport volume is assigned to intermodal transport by 30%, more than half of the overall investment needs refers to intermodal transport. This is due to high expected growth rates in this market segment.

  29% respectively 25% of the overall invest is required by Private sidings/Railports. As already stated above, no investments in Stations with public sidings are foreseen (in all scenarios).

  As Figure 60 also points out, the major part of the conventional investments is required by countries from cluster I. This firstly refers to the volume share of these countries. Secondly, it incorporates specific framework conditions of these countries: high construction/upgrade costs as well as a comparably strong position of single wagon transport with respective consequences for the rail layout.

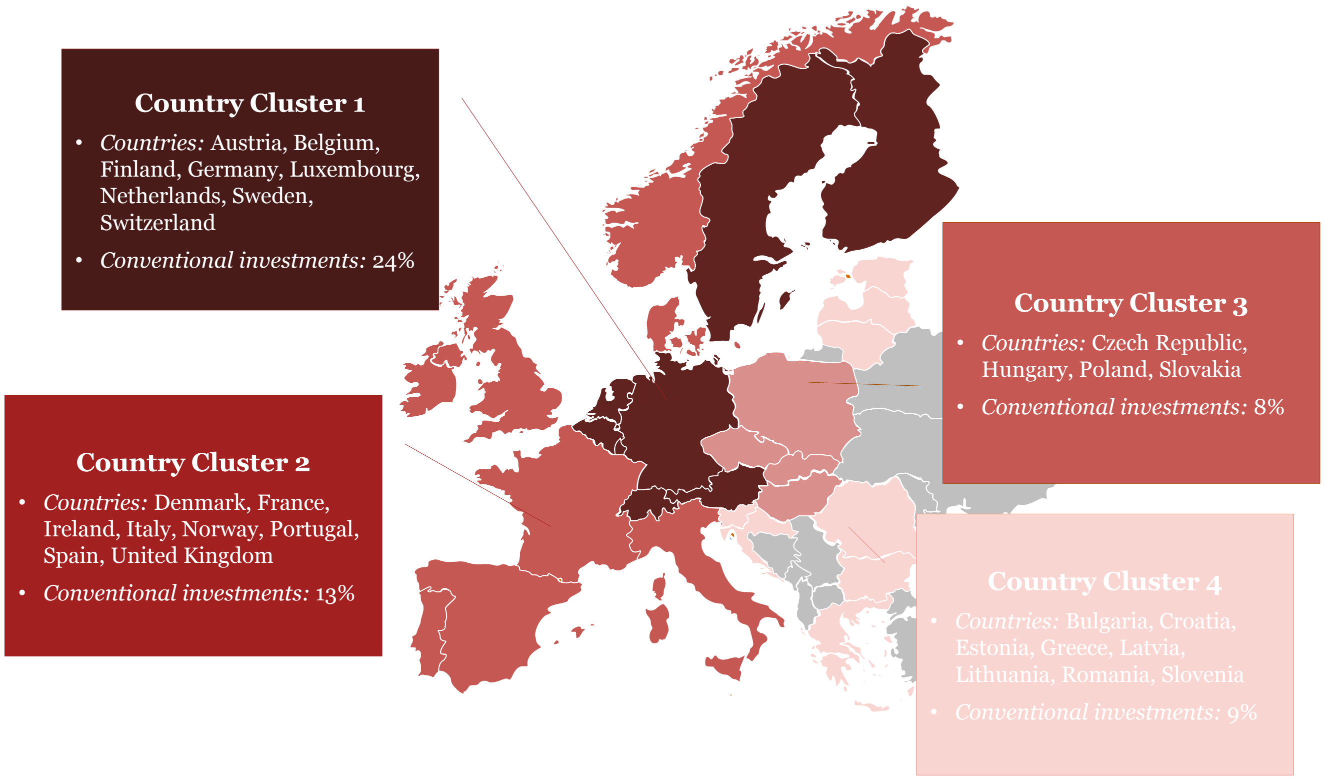
Figure 61 – Trend scenario 2030: Distribution of LMI investment needs by intermodal terminals/conventional Access Points and by Country clusters



Source: HaCon

In the following map, the geographical representation of the **conventional investment** is reported.

Figure 62 – Last Mile investment needs by conventional access points and country clusters



- In the **Minus scenario,** this total amount drops to 9 billion EUR, mostly due to conventional facilities. Compared to the Trend scenario, Private sidings and Railports show an investment decrease by 14%, compared to -29%/-18% for the Access Point development. This follows the general tendency that small and middle-sized facilities will be abandoned above average and incorporates the different investment figures for large/medium/small facilities in the respective country clusters.
- The **Plus scenario** shows an investment growth by 16% compared to the Trend scenario to 11.2 billion EUR totally. Conventional as well as intermodal investments increase stronger than the volume development in this scenario, since middle-sized facilities participate above average in new construction and upgrading of facilities.

4.5.2. Financial need for LMI annual maintenance

The deduction of maintenance costs is based in the construction values of the respective last-mile facilities (value of the "new" facility). A dedicated percentage figure of this construction value is then calculated for annual maintenance. The overall construction value of all facilities must of course incorporate the abandoning, the new construction and the upgrading of the last-mile infrastructure as described in chapter 4.5.1; furthermore, the LMI types and country clusters must be distinguished. Generally, the construction value is calculated as

- Construction value of the existing 2015 Access Points (i.e. minus abandoned facilities):

  For Private sidings, this figure has been assessed between 7.8 and 1.6 Mio EUR per facility, depending on location in country cluster I/II/III/IV. This bandwidth takes into account respective shares of large, medium-sized and small facilities as well as the technical equipment in the country clusters.

  The construction value of Public sidings is particularly lower, since they often consist only of one or two tracks with a connected loading lane and/or ramp. Thus, the average value war calculated with 0.5 - 0.2 Mio EUR for the different country clusters.

  The construction value of Railports is in similar range as Private sidings. However, the range of figures for the respective country clusters is smaller compared to Private sidings, as Railports show a more standardised layout and technical equipment. Thus, the construction value per facility has been estimated between 7.5 and 6 Mio EUR.

  Intermodal terminals have been calculated with 11.5 EUR per facility for all country clusters.

  The number of existing and abandoned facilities per LMI type, country cluster and scenario has already been deducted in chapter 4.5.1.

- Plus construction value of new facilities:

  The number of new facilities per LMI type, country cluster and scenario has already been deducted in chapter 4.5.1.

  Generally, the construction value of new Private sidings is lower compared to the existing ones, since sidings of high value belong to the (very) large companies that mostly already possess such a siding. Thus, new private sidings are allotted to rather medium and (partially) small companies.

  In contrast, the construction value for new and existing Railports is about the same.

- Plus upgrading measure with value increasing impact:

  The number of upgraded facilities per LMI type, country cluster and scenario has already been deducted in chapter 4.5.1. As already described there, 50% of the upgrade invest is estimated as value increase of the respective facility.

Based on this construction value, the annual maintenance costs were calculated as

- 3% for Private sidings,
- 2%-0.5% for Public sidings (depending on country cluster),
- 4% for Railports,
- 5% for Intermodal terminals.

Table 47 summarises these assumptions and calculation figures. They represent basic figures of the model. Whenever dedicated (e.g. country specific) values were available, these have been used instead.

Table 47 – Main input figures for maintenance cost calculation

	Private sidings	Public sidings	Railports	Intermodal terminals
Construction value of existing LMI				
Country cluster I	5.7 Mio EUR	0.5 Mio EUR	7.5 Mio EUR	11.5 Mio EUR
Country cluster II	7.8 Mio EUR	0.4 Mio EUR	7.5 Mio EUR	
Country cluster III	3.4 Mio EUR	0.3 Mio EUR	6.75 Mio EUR	
Country cluster IV	1.6 Mio EUR	0.1 Mio EUR	6.0 Mio EUR	
Construction value of new LMI: see Table 40				
Upgrading measures with value increasing impact: see Table 40 Assumption: 50% of the upgrade invest is estimated as value increase of the respective facility				
Annual maintenance costs (referring to the construction value)				
Country cluster I	3%	2.0%	4%	5%
Country cluster II	3%	1.5%	4%	5%
Country cluster III	3%	1.0%	4%	5%
Country cluster IV	3%	0.5%	4%	5%

Source: HaCon

The resulting maintenance effort (prices of 2015) for last-mile infrastructure in Europe is displayed in Table 42. In total, the annual costs drop from 2.8 billion EUR in 2015 to 2.4 billion EUR in the **Trend scenario** and further to 1.9 billion EUR in the 2030 **Minus scenario**. The **Plus scenario** shows an increase by 7% compared to the Trend scenario, but stays below the 2015 figure. This roughly reflects the development of the total Access Point number. The difference results of the scenarios are completely due to the number of new/upgraded Access Points and their requested invest. In contrast, the construction values of existing infrastructure and the maintenance percentages have been kept constant in all scenarios.

Table 48 – Annual maintenance costs for LMI

EU28+2		2015 [Mio t/a]	2030 Trend		2030 Minus			2030 Plus		
			[Mio t/a]	Δ to 2010	[Mio t/a]	Δ to 2010	Δ to 2030 T	[Mio t/a]	Δ to 2010	Δ to 2030 T
I.	**Conventional Access Points total**	**2.394**	**1.916**	**-20%**	**1.378**	**-42%**	**-28%**	**2.044**	**-15%**	**7%**
	- Private sidings	2.313	1.751	-24%	1.234	-47%	-30%	1.870	-19%	7%
	- Stations with public sidings	27	15	-45%	7	-74%	-52%	15	-45%	0%
	- Railports	55	150	172%	137	147%	-9%	159	188%	6%
II.	**Intermodal terminals**	**420**	**512**	**22%**	**500**	**19%**	**-2%**	**551**	**31%**	**8%**
All rail freight access points		**2.814**	**2.427**	**-14%**	**1.878**	**-33%**	**-23%**	**2.595**	**-8%**	**7%**

Source: HaCon

4.6. Conclusions

The analysis of framework conditions with particular impact on the development of last-mile infrastructure has highlighted that:

- The current developments of the freight market in Europe (e.g. Liberalisation of European and national transport markets, changes of goods structure requiring small, fast and reliable shipments, logistics effects like JIT or JIS) favour particularly road transport.
- Consequently, the current European freight market shows a modal share for rail freight of 10% (related to the transport volume [t]). **Within the European rail freight market, conventional transport (block trains and single wagon load) is still dominating with 82%** of the total rail volumes. However, intermodal transport is strongly increasing particularly in Western, Central and Southern Europe.
- **Traditional markets for conventional rail freight are settled around energy** (coal, mineral oil products), **steel** (coal, coke, ore, and steel/metal products), **automotive, chemical products and paper/wood**. These traditional markets contribute by 64% to the overall rail freight volume in EU28+2.
- Rail production systems have a considerable impact on last-mile infrastructure. Last-mile infrastructure and operation must balance framework conditions set by the railway operators on one side and by the product manufactures on the other side. The bigger the difference between these two perspectives, the more complex last-mile infrastructure and operation will turn out to be.
- Technical developments with considerable effects on last-mile infrastructure needs and operation derive from the deployment of Bi-modal vehicles, hybrid locomotives and especially from standardised wagons, which separate the rolling from the loading part of the wagon and thus allow for easy adaption to different transport demands.

On the basis of both the market analysis and the stakeholder consultation, **the investment needs in last mile infrastructure** have been quantified for time horizon 2030. In this context, framework conditions of three scenarios for the development of conventional rail freight were considered:

- "Trend 2030": Extrapolation of current tendencies (i.e. increase of large sidings; abandoning of many small and some mid-sized facilities; Public sidings will lose their relevance; Railports will (partially) substitute closed private and public sidings).
- "Minus 2030": unfavourable conditions for rail freight compared to "Trend" (i.e. higher concentration on large Private sidings; above-average abandoning of small- and mid-sized Private sidings; Public sidings will significantly lose their importance).
- "Plus 2030": more favourable conditions for rail freight compared to "Trend" (i.e. ongoing trend to large private sidings; above-average "survival" of small- and mid-sized private sidings).

Concerning the intermodal transport it has been assumed that the "terminal landscape" will not significantly change until 2030 in all three scenarios: the trade lanes and today's terminal locations will remain; the increase of transhipment volumes and subsequent necessary capacity expansions will be primarily ensured by upgrading and replacement of existent terminal facilities.

Based on these developments, the investment needs in last-mile infrastructure have been calculated as follows:

- In total, new construction and upgrade of last-mile infrastructure in Europe will request some 9.7 billion EUR in the "Trend" scenario between 2015 and 2030. 46% of this total investment need is allotted to Intermodal terminals; 29% respectively 25% of the overall invest is required by Private sidings/Railports.
- In the "Minus 2030" scenario the investment need drops to 9 billion EUR, mostly due to the decrease of conventional facilities.

In the “Plus 2030” scenario, required investments grow to 11.2 billion EUR totally. The increase rate is lower than the facility development, since facility increase refers above average to small/mid-sized.

5. Guidelines and recommendations

This chapter aims to provide **suggestions and contributions in order to develop, improve, monitor last-mile support programmes**, also including key elements relating to **non-financial instruments and measures** (e.g. making the procurement procedure more efficient, streamlining permit procedures).

In particular, starting from the information gathered and the outcomes identified, two different contributions are presented:

- ***Guidelines***, potentially to be addressed to **Member States** and **Regions,** (see chapter 5.1), aiming to develop and improve technically sound and effective last-mile support programmes; in this view, the guidelines provide entity in charge(s) for the **specific LMI support programme development** with suggestions on the potential "contents" ("how" to design and setting up the support programme, from the planning phase to the operational improvements), in terms of stakeholders to be involved, eligible costs, forms of support, reward mechanism and so on;
- ***Recommendations*** (see chapter 5.2), mainly focused on the **governance systems** for the implementation of the **LMI Development Plan** (LMDP) at EU/Country/Regional level, aiming to introduce suggestions on the **implementation solutions/tools** to be considered to develop the overall plan and make the specific LMI support programme(s)/project(s) operative and effective.

Finally, a specific recommendation about the **State Aid** for last mile infrastructure is described in the chapter 5.2.5.

5.1. Guidelines for the Last Mile infrastructure programme

The following guidelines are divided into **two sub-sections**:

- the first group of guidelines (A) refers to the **planning** phase and to the setting up of a **new support programme**, in the most exhaustive, efficient and effective way;
- the second group of guidelines (B) presents and lists the main practices, measures and/or actions for the **operational improvements of the existing programme**;

Transversally, **there is the monitoring phase** in which operational objectives may be fine-tuned, performance measures and strategies may be refined to ensure they are focusing on key priorities and most relevant achievable results.

It is therefore important **to convey the guidelines from the EU to a stakeholders' network** (e.g. associations, agencies, etc.) in order to periodically disseminate useful practices for investment (thus not only a financial support) in last-mile infrastructure.

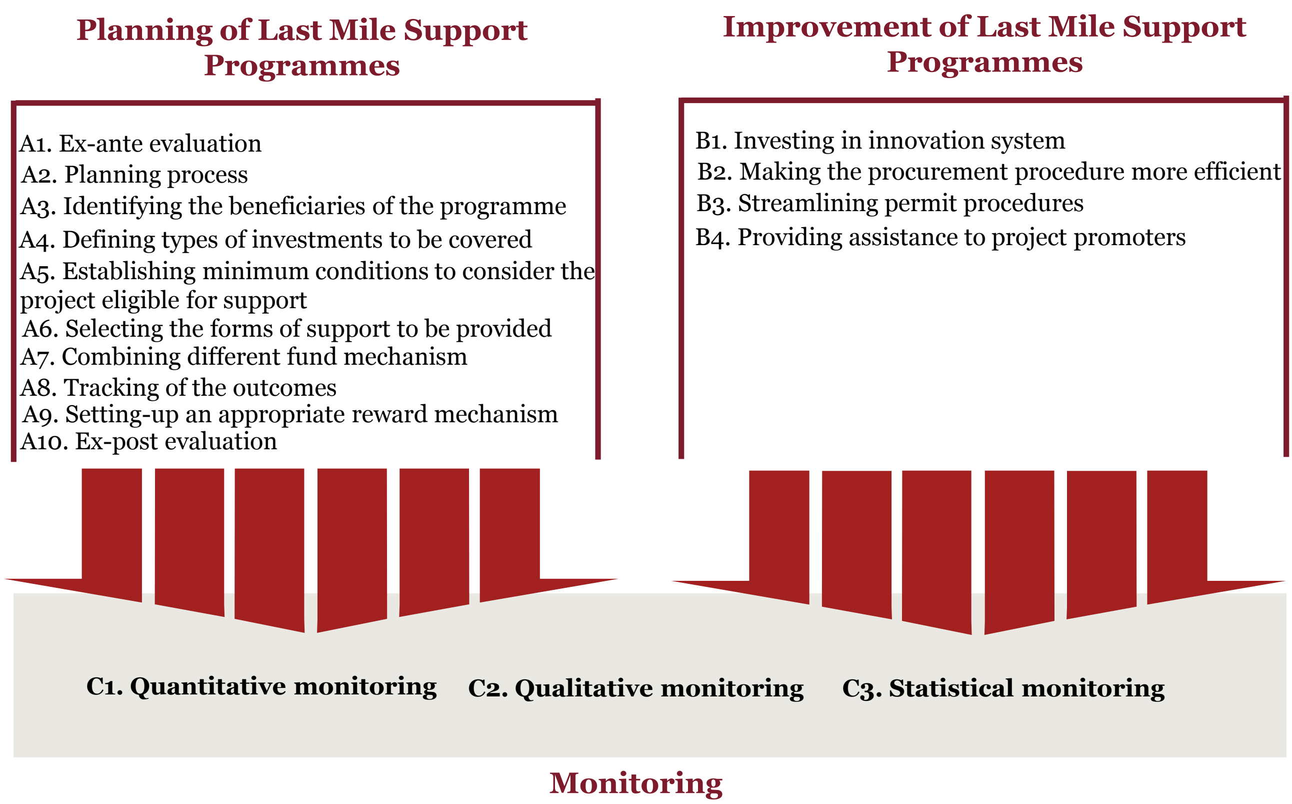
Accordingly, in line with the overall approach of this study, the following clusters of stakeholder have been involved in the process of analysis:

- Associations (ERFA, ESC, CLECAT, EIA, EIM, ESPO, UIRR);
- Industries;
- Infrastructure managers;
- Logistic nodes/Freight villages managers;
- Port authorities;
- Rail – road terminal managers;
- Railway associations at EU and National level.

Interviews with **Member States/Regions/relevant managing authorities** have been used in order to fine-tune and integrate the data collected (see Annex A).

Considering the argument presented before, the list of topics identified is presented in the following figure and described in the following chapters.

Figure 63 – Overview of the guidelines



5.1.1. A) Planning a new support programme

Planning a last-mile infrastructure support programme means developing a cyclical economic-technical approach based on pre-identified **information – and periodically updated – at local, regional and country level through a strong stakeholder consultation**. The outcomes and findings of the analysis of the data collected (as introduced in chapter 2 and 4) clearly indicate the **need for an action plan and investment in last-mile infrastructure.**

A1. Ex-ante evaluation of the adopted measures

Programmes or instruments ***should be designed in a coherent way****, often as part of an* ***ex-ante evaluation*** *or impact assessment process. The ex-ante evaluation is expected to ensure that what is proposed in the last-mile support programmes is logical and justified, and that the proposed priorities, objectives, measures and allocations of resources are appropriate to respond effectively to the needs identified.*

An ex ante evaluation[80], regarding a last-mile support programme, should appraise the elements reported in the following table.

Table 49 – Ex-ante assessment: main elements to be considered

Contents of the ex-ante evaluation	Elements to be considered

[80] Ex-ante assessment methodology for financial instruments in the 2014-2020 programming period, European Commission, 2014

Contents of the ex-ante evaluation	Elements to be considered
• **Scope of the programme** (projects and/or infrastructure included, area, rail freight and logistic operators, traffic flow addressed, etc.)	• Conditions of the railway network; • Industrial density (or actual and foreseen demand) at country and regional level; • Needs and requirements of (specifically Small and Medium) enterprises and other potential "demand nodes"; • Market analysis and identification of all potential stakeholders (e.g. industries, railway undertakings, etc.) involved in the design of last-mile infrastructure;
• **Contribution to EU strategy** for smart, sustainable and inclusive growth, having regard to the selected priorities, national and regional needs and lessons drawn from previous periods[81]; • Rationale of the form of support proposed;	• EU strategy and transport Master Plans at country and/or regional level; • (Pre-identified) Projects for possible EU funding during the 2014 – 2020 timeframe, based on eligibility criteria, their added value for TEN-T development and maturity status;
• **Programme elements** (also including potential transport demand, costs, time frame and risk of the supporting programme)	• Development scenarios for rail freight transport demand (considering also origin/destination matrix of good clusters, e.g. wood, cereal, paper, etc.) by road/rail (affected by each sidings/last mile infrastructure included within the investment programme). • Strategic Environmental Assessment
• **Expected outputs** and relevant and clear **programme indicators** (to be monitored)	• Suitability of procedures for monitoring the programme and for collecting the data for evaluations; Suitability of milestones selected for the performance framework

The ex-ante evaluation can establish baselines for result indicators. For each measure and action, an ex-ante evaluation should be developed at country, regional and/or "territorial" level (e.g. municipalities, districts, and so on).

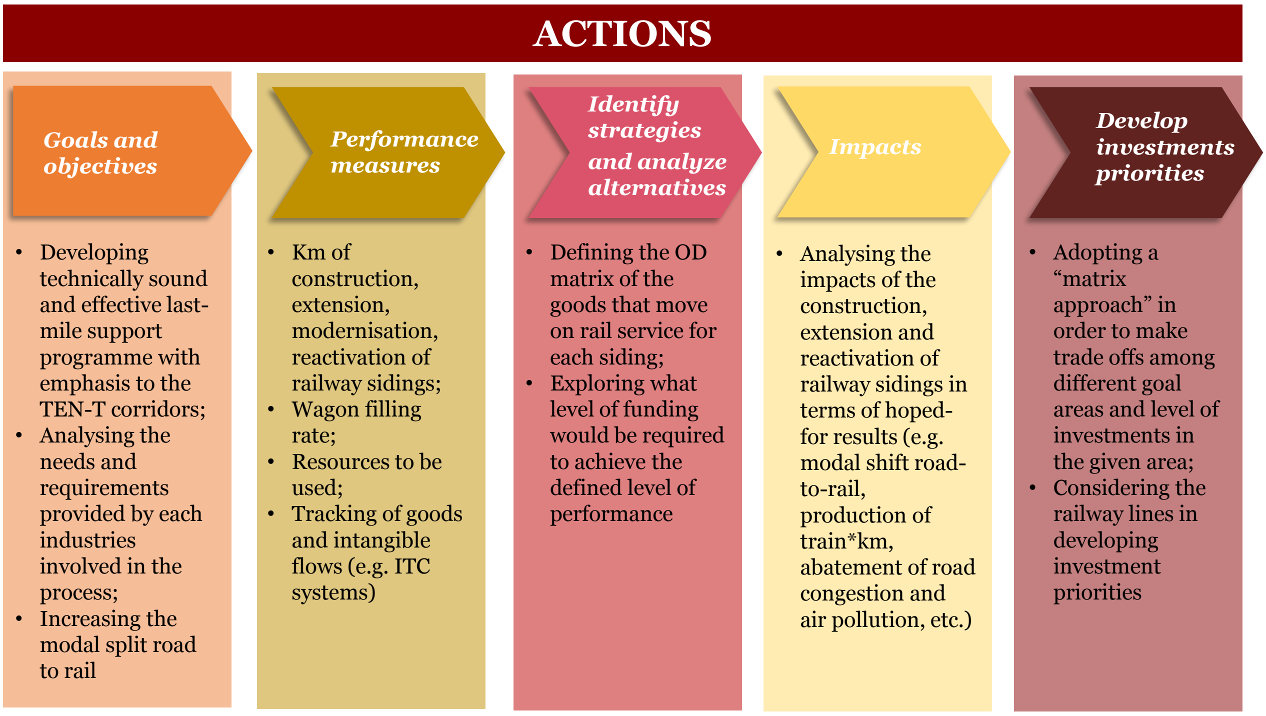
A2. Planning process

*The **planning process should be based** on a specific approach including the identification and definition of **goals and objectives, performance measures, strategies and alternatives, impacts and investments priorities and responsibilities**.*

The following flow chart summarises the main elements of each step of the planning process.

[81] The SWOT analysis of the ex-ante evaluation could prove particularly useful.

Figure 64 – Last-mile infrastructure planning flow chart



The stakeholder consultation process - within the transport and logistic system - plays a key role in determining goals, performance measures, and investment priorities. Data gathering process - of past, existing, and future investment programmes, expected performance and information on the possible strategies - helps to identify an effective support programme.

Promotion activities and stakeholder involvement (both from private and public sector) are key requirements for any practical and useful support programme, based on a "bottom up" data gathering process, useful to identify needs (in terms of investment, financial and "non-financial" support) and infrastructure development foreseen.

In the following table, the assessment drivers/questions for stakeholders in promotion of last-mile infrastructure are set out.

Table 50 - Assessment questions in the promotion of a last-mile infrastructure

Driver	Questions
Economic	*Proof of economic feasibility*: is private funding already sufficient to ensure the last-mile infrastructure's economic feasibility?
	Proof of financing: is the total financing of the measure secured?
	Bank guarantee: is a bank guarantee included in the overall financing?
	Special constructions: can the suitability and cost-effectiveness of special constructions be demonstrated?
	Minimum threshold: is the funding amount at least equal to € 15.000 (e.g. German practice)?
Activation and sustainability of the measure	*Start of measure*: did the measure's implementation start before the application date?
	Sustainability: does the measure favour an actual, substantial, measurable, and sustainable handling of freight transport by rail?
	Necessity: is this last-mile infrastructure necessary for handling freight?

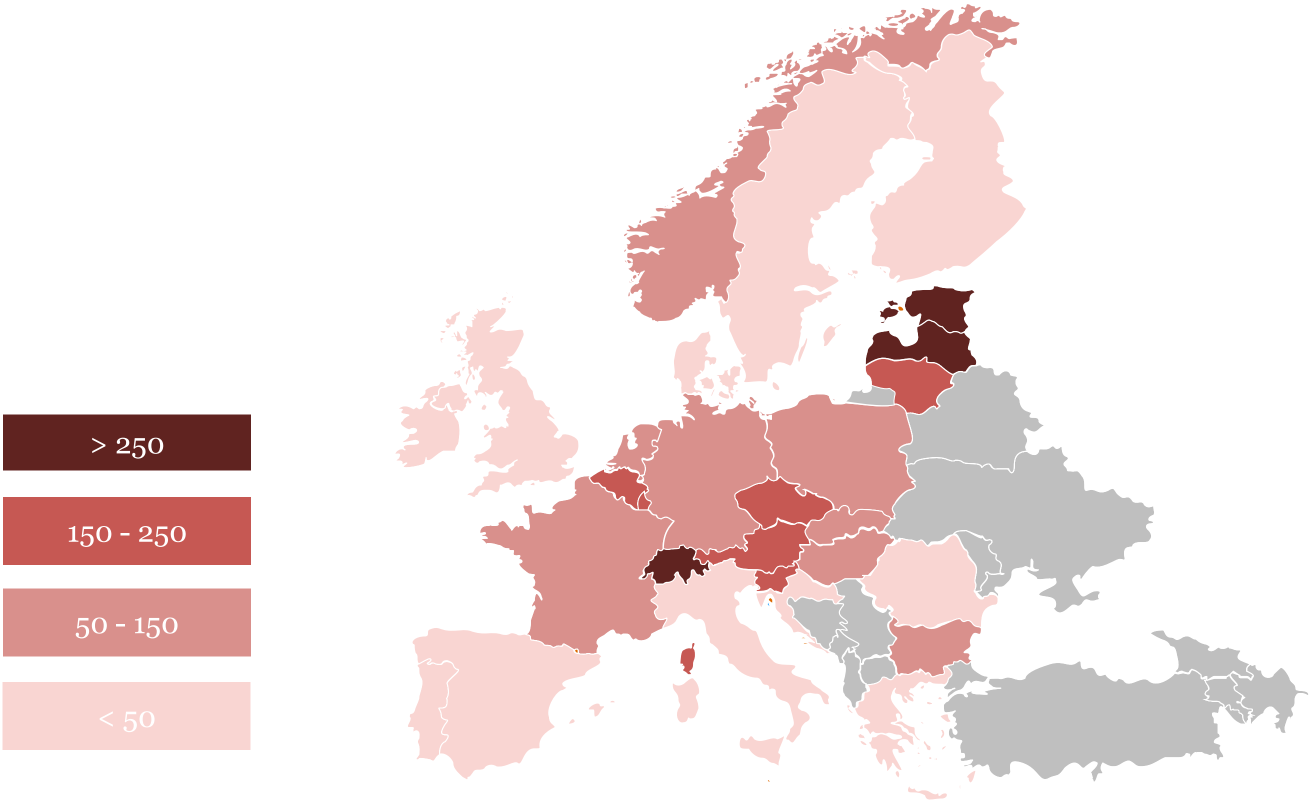
Driver	Questions
Intermodal transport	*Competitive advantage (A)*: is the use of the last-mile infrastructure in competition with other environmentally friendly modes of transport?
	Competitive advantage (B): If not (A), then is the use of the last-mile infrastructure in competition with other modes of transport?
	Public intermodal terminals: is the unavailability of an existing public intermodal terminal with new rail traffic volumes sufficiently documented?
Performance	*Freight traffic volumes*: is it possible to both develop a prognosis for the future traffic volumes of the link and to determine the origin of these volumes?
	Confirmation of previous traffic volumes: is official data available about the transport volumes of the past two years?
	Commensurability: how do funding volumes compare to additional rail traffic volumes?
	Deviation from the peak values: is there confirmation from the respective authorizing committee for deviations of peak values?
Network	*Transport insurance*: is there a transport framework agreement with a railway undertaking (if necessary with reservation to the approval of funding) at the date of application?
Compliance	*Planning criteria*: have all the necessary planning criteria been met at the date of application?
	Regulatory bodies: are the relevant regulatory and other public agencies involved in the process of construction and upgrade of the last-mile infrastructure and can it be assumed that the project is compliant with the country's law?

A3. Defining programme beneficiaries after the ex-ante evaluation while ensuring support from all project stakeholders

***Beneficiaries of the last-mile support programme should be clearly defined** and appropriate eligibility criteria set according to their sector/category. In particular, it is essential to ensure a reasonable number of industries and of railway line km. The following figure shows the number of private sidings per 1.000 km.*

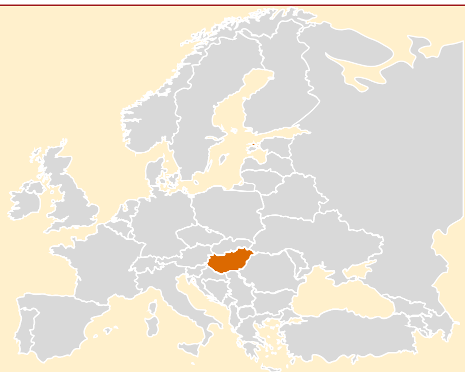
Additional conditions for the provision of support have to be considered: ensuring the commitment of all stakeholders to participate pro-actively and co-operatively in the successful development and completion of the project.

Figure 65 - Number of private sidings per 1.000 km



- In case of private sidings, the support programme should primarily target commercial/industrial enterprises willing to connect their distribution/production site to the national rail network or strengthen the existing connection.
- Beneficiaries of support for private sidings should include communities of interest and consortia (e.g. different enterprises located in a district and willing to share the same rail access to the rail network), municipalities and regions.
- Beneficiaries of the support programme should be grouped as a network in order to:
    - achieve economies of scale (where and when applicable),
    - achieve greater market penetration capacity,
    - achieve the critical mass needed to build up their leverage with financial institutions.
- All the stakeholders involved – to a different extent – in the development of the project should be required to demonstrate their willingness in working together and supporting the beneficiary of the programme during the various phases of the project, with the ultimate objective of completing it on time and on budget.

Case Study: Connection of Mercedes-Benz manufacturing facility to the main rail network



Description: In this project, the Hungarian national railway operator and the programme beneficiary Mercedes-Benz jointly inaugurated a 3 km-long last-mile infrastructure that connects the Mercedes-Benz production facility in Kecskemét with the main Hungarian rail network. The main objective of the track is to carry manufacturing and assembly parts to the factory and completed cars on the way back. The track is operated by LTE, and DB Schenker takes the cargo over on the main network to carry it further in Europe.

Time frame: 2009 – 2013

Investments: The project costs were 450m Forint (approx. €1.5m). The costs were financed by Mercedes-Benz but €0.8m (approx. 50%) of it was covered from the €111.5m State aid that the company received from the Hungarian government in 2009.

No EU funding was involved. The tracks remained the property of the Hungarian railway operator. The project is a good example of how to use "public grant" with the objective of boosting local economic development as a complementary source of funding also the construction of last-mile infrastructure. A remarkable aspect of this project was the smooth cooperation between Mercedes and the Hungarian railway operator.

What would have happened without the financing?

The funding received for the building of the last-mile infrastructure formed part of a larger financial support of €111.5 m granted to Mercedes-Benz by the Hungarian Government in 2009 (and approved by the European Commission under State Aid rules).[82] The objective of the funding was to finance the installing of new machinery for the manufacture of two new passenger car models. In order to be able to carry the increased volume to and from the factory, parts of the financial support were to be used for the construction of the last-mile infrastructure. Therefore, without the financing and building of the last-mile track, the factory would have continued to use the old method of moving materials to and from the factory (i.e., by trucks).

Added value of financing

The financing acted as an incentive for Mercedes to engage in building the last-mile infrastructure.

Impact of investment

- More efficient logistics due to connection to main rail network;
- Improved environmental impact: shift to rail from other modes of transport (mainly trucks);
- Contribution to regional development.

A4. Types of investments and costs eligible for financing

The types of investments covered by the last-mile support programme should be precisely defined along with the costs considered eligible for financing*. These costs should be properly detailed to the potential applicants, through the most appropriate means of communication.*

Furthermore, ***there is the need to consider intermodal platforms*** *and the last-mile related facilities such as terminals, marshalling yards and cross-border infrastructure. Seizing the opportunities of developing intermodal logistics, the enterprises can optimize their supply chain structure to benefit from both the transport logistics services and the improved performance of economic activities as a whole.*

- The investments covered by funding should primarily include the construction of new sidings and the extension/renovation of existing ones, considering and providing different (also assessment) criteria and thresholds for each of these cases;
- However, the last-mile programme should not be limited to cover physical investments, but should also include intangible infrastructure (e.g. ITC systems for managing and optimising traffic flows);
- Eligible costs should include, at a minimum, the construction activities, expenditures for the railway systems necessary to operate the sidings once built or renovated and loading/unloading facilities and machinery;
- Costs related to the repair or maintenance of the infrastructure/machinery, switches, leasing-funded facilities and equipment and all the costs incurred before the application are generally considered as non-eligible by programmes exclusively dedicated to support sidings development;

[82] http://europa.eu/rapid/press-release_IP-09-1147_en.htm

- Broader-scope support programmes may provide an extended range of investments types and costs considered eligible for financing (e.g. construction of terminals, stations and other facilities).

Case Study: Construction of the Thriassio Pedio Complex

Description: The project consists of the construction of a modern freight complex of Thriassio Pedio in the Athens greater area, where railway and freight activities will be assembled. It will contain: marshalling yard, container terminal, customs office, freight station, group of stabling tracks for rail vehicles carrying dangerous loads, wash plant installations and all necessary facilities to accommodate these activities. The complex since 2013 is connected to the major Piraeus freight port in N. Ikonion. As highlighted, the project is an excellent example of great variety of costs eligible covered for financing.

Time frame: 1999 – 2016

Investments: The total project cost is € 221 million, whereas pure national funding represents 10% of the total costs of the project, EU contribution is 50% and a loan from European Investment Bank covers the remaining 40% of the cost. Interestingly, the project was done in two operational phases, the first one financed through the EU Cohesion Fund and national funds and the second one financed through ERDF, national funding and EIB loan.

What would have happened without the financing?

Considering that 50% of the project costs were financed from EU sources (ERDF and CF) and only 10% from national sources (the remaining being covered by an EIB loan), it is unlikely that the project could have been realised without the EU support. Even with a greater EIB loan, it is unlikely that the amount needed for the entire project could have been covered.

Added value of financing

The EU grant has certainly acted as a strong incentive for the completion of a large project like this one;

The extent of the funding (50%) was also an important added value.

Impact of investment

- Develop transport interconnection to meet increasing demand;
- Integrate different transport modes into combined transport systems;
- Integrated rail facilitites: freight station, logistics, warehousing, intermodal connection (rail to truck);
- More efficient handling of freight;
- Lower energy consumption;
- Improved regional development and economic cohesion;
- Reduced negative effects on the environment.

A5. Establishing minimum conditions to consider the project eligible for support

At a preliminary stage of project analysis, ***a set of minimum conditions and criteria should be identified and applied*** *in order to separate projects that are eligible or not eligible.*

Minimum conditions for project eligibility:

- To receive financial support, resources made available by the private/public alone should be insufficient to cover the overall investment needs of the project;

- At the time of application and request for support, the project should have an excellent maturity, in terms of compliance with the proposed time plan and the technical specifications (certificates or supporting documentation about legally mandatory approvals are essential);
- The project should produce measurable and achievable benefits in terms of modal shift, logistic performance and environmental improvement;
- The benefits expected to be generated by the new-built or renovated siding should be reasonably estimated, well-documented and guaranteed during the financing period;
- The intervention should not come to the detriment of other environmentally friendly modes of transport (e.g. waterways);
- The support provided might cover a specific percentage of eligible costs (usually, no more than 50%), while a minimum financial threshold should be established, below which projects cannot be considered eligible for assistance.

A6. Selecting the forms of support

***Various forms of assistance may be provided by the last-mile programme**, either in a direct form (grants, loans, PPP models) or indirect form (tax benefits, guarantees, train*km incentive). These forms of support might be combined together on a case-by-case basis to maximise the effectiveness of the assistance provided.*

Table 51 – Description of the forms of support

Support Scheme	Description
Grants	Non-repayable grants are the most common form of support currently provided by last-mile dedicated programmes in Europe (Austria, Germany, and Switzerland). To prevent any misuse of the financial resources allocated, an effective prevention and control system is generally set up (ex-ante/ex-post monitoring, bank guarantee provided by the beneficiary, refund requested in case of non-compliance, etc.)
Loan	Short, medium and long-term loans (both at variable and fixed interest rate) may be provided by numerous financial institution at regional, national or European level. Loans contracted at preferential rates are the appropriate form of financing under this category.
Public-Private Partnership (PPP) models	The private sector is encouraged to participate in infrastructure funding, among others, through PPP models. In case of last-mile financing, the government may provide a capital subsidy (e.g. one-time grant) to encourage – for instance – private companies to invest their own resources in the construction/upgrade of rail sidings linking their production/distribution site to the national rail network.
Tax benefits	Government can recognize a contribution to economic growth, congestion reduction and greenhouse gases emission abatement by providing tax benefits to private companies investing in last-mile projects.
Guarantees	Primarily aimed to attract private investment in projects with a good chance of success and profitability
Train*km incentive	Train*km incentive (i.e. for RUs and/or logistics players operating along the rail section addressed by the last mile support programme) should be introduced in order to incentivise production performance in line with the demand

The PPP scheme offers some benefits, despite some critical aspects and limitations. The size of the investment has to be sufficient to allow economies of scale (see case studies below); however, it should not lead to an overly complex project (also due to the limited flexibility for the scheme) that would last too long. Standardisation can reduce complexity and costs of implementing the PPP schemes including last–mile support programme.

In the following boxes, such PPP case studies are reported.

Case Study: Construction of three industrial sidings in Ariège, France

Description: The project entails the building of three new sidings (rail connections between the national railway network and the industrial sites) on the Ariège railway allowing the private enterprises in the industrial area of Pamiers to connect to the national railway network, thereby promoting a sustainable mode of transportation. The project is based on a partnership between the French state, the French infrastructure manager (Réseau Ferré de France), the local community of Pamiers and four aggregate producers (Denjean, Ariège Granulats, Sablières Malet, Midi-Pyrénées Granulats Groupe Lafarge).

The project is noteworthy for the use of an exemplary public-private partnership between the state, local community, the infrastructure manager, on the one hand, and the interested private enterprises, on the other hand.

Investments: The total costs consist of an investment of more than € 5 million. The French state contributes through a direct grant to SNCF Réseau (representing 25% of the costs). For the remaining 75%, financial contribution from the local community and the private companies is provided.

What would have happened without the financing?

It remains uncertain what would have happened without the financing, but one of two scenarios would have been likely: Firstly, there could have been no sidings built at all, and the existing transport solutions would continue to be used. The second option would have been financing of the sidings by private partners alone (i.e., no State involvement).

Added value of financing

Contribution to costs of building sidings;

Added value also in terms of showing commitment on the part of the State to implement national policies on promoting rail freight transport and environmental protection measures.

Impact of investment

- Contribution to the local and national policies on increasing rail freight to 25% by 2022 and fostering territorial development (Grenelle Guidelines);
- Boost local economy and employment;
- Reduce environmental negative effects.

Case Study: Line Vendome – Montoire-sur-le-Loir

Description: The line is in the north of the Loir et Cher department. Only one industry is connected to rail on this line and it is one of the main French grain collector, Axéréal. The line is 15 km long and the traffic is 110.000 t/year of cereals. The project for renovation of the line is based on a partnership between the French State, other local public entities (sous-préfecture de Vendôme; DREAL région Centre ; UT41 DIRECTCTE; Conseil régional Centre; CESER Centre; Conseil Général du Loir et Cher; Mairies de Théré La Rochette, Saint Quentin les Troo, Troo, Montoire, Saint-Rimay, Fontaine-les-Coteaux ; Communauté de Communes Vallées du Loir et Braye, Communauté du Pays de Vendôme, représentante du député

Denys Robillard),the French infrastructure manager (SNCF Réseau), and the only industry connected on the line Axéréal.

***Time frame**: January 2016 – April 2016*

Investments: The total costs consist of an investment of € 4 million

What would have happened without the financing?

Line should has been by the infrastructure manager end of 2015.

Added value of financing

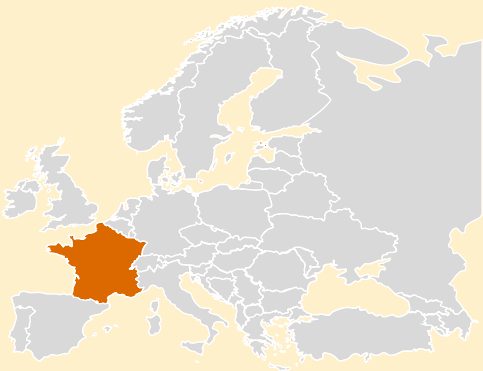
Contribution to costs for renovation of railway assets important for regional development, French exports and activity in the area. Added value also in terms of showing commitment on the part of the State to implement national policies on promoting rail freight transport and environmental protection measures.

Impact of investment

- Contribution to the local and national policies on increasing rail freight to 25% by 2022 and fostering territorial development (Grenelle Guidelines);
- Support local economy and employment;
- Reduce environmental negative effects.

Case Study: Line La Gorp – Bec d'Ambès

Description: The project entails the renovation and modernisation of an important railway line for the Port of Bordeaux and the regional activity. Line is 18 km long. Traffic is high on this line about 500.000 tons, mainly of chemicals and dangerous goods. If the line is no longer usable, it means more than 20.000 trucks on roads in the area. The project is based on a partnership between the French state, the French infrastructure manager (SNCF Réseau), local communities such as CUB and mairie d 'Ambès. Five industries are connected to the line, mainly chemical and petroleum industry.



Time frame: 2016

Investments: The total costs consist of an investment of about € 20 million. SNCF Réseau first realised works to keep the line open and financed this work from its own budget € 600.000. State, Region, CUB, EU and SNCF Réseau will finance the works to be realised in 2016.

What would have happened without the financing?

Line would have been closed in October 2015.

Added value of financing

Contribution to costs of renovation of last mile lines near – by big cities and linking the urban area to an industrial area with rural areas in between (vineyards). Added value also in terms of showing commitment on the part of the State to implement national policies on promoting rail freight transport and environmental protection measures.

Impact of investment

- Contribution to the local and national policies on increasing rail freight to 25% by 2022 and fostering territorial development (Grenelle Guidelines);
- Support local economy and employment;
- Increase safety in the area;
- Reduce environmental negative effects.

Case Study: Line Oiry - Esternay

Description: The project entails the renovation of a long last-mile railway line on which several competing industries are connected. Length of the line is 70 km.

Traffic is 185.000 t, mainly grain and sugar. It is planned to ask the different market players to be partners and contribute to funding of renovation works.

Among them: French state, French infrastructure manager (SNCF Réseau), the Conseil Regional Champagne Ardennes, the Conseil Général de la Marne, local community of Chalons en Champagne.

The project completion would be significant for the use of an exemplary public-private partnership between the state, local community, the infrastructure manager, on the one hand, and the interested private enterprises, on the other hand.

Time frame: 2016

Investments: The total costs consist of an investment of € 10 million plus € 3,5 million for maintenance over the next 10 years. No agreement reached up to now. Industries are not interested to invest, but they would accept to contribute to maintenance during some years.

What would have happened without the financing?

If no agreement is reached, whole line should be closed by 2017, part of it should be closed in 2015.

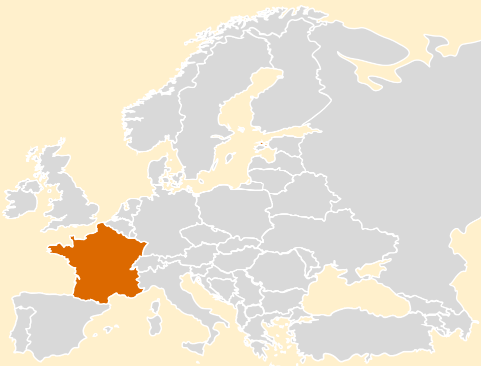
Added value of financing

Contribution to costs of renovation of lines; Added value also in terms of showing commitment on the part of the State to implement national policies on promoting rail freight transport and environmental protection measures.

Impact of investment

- Contribution to the local and national policies on increasing rail freight to 25% by 2022 and fostering territorial development (Grenelle Guidelines);
- Support local economy and employment as well as French exports;
- Reduce environmental negative effects.

Case Study: Line Blois - Villefrancoeur



Description: The project entails the renovation of a line (15 km) near Blois on which two important grain collectors are connected to rail. Traffic is 180.000 t /year, mainly grain for exports via French ports. The project is based on a partnership between the French State, the French infrastructure manager (SNCF Réseau), and local communities.

The project is significant for the use of an exemplary public-private partnership between the state, local community, the infrastructure manager, on the one hand, and the interested private enterprises, on the other hand.

Time frame: 2016

Investments: The total costs consist of an investment of € 3.2 million

What would have happened without the financing?

Line was closed mid May 2014. Reopening is now planned for mid-2016.

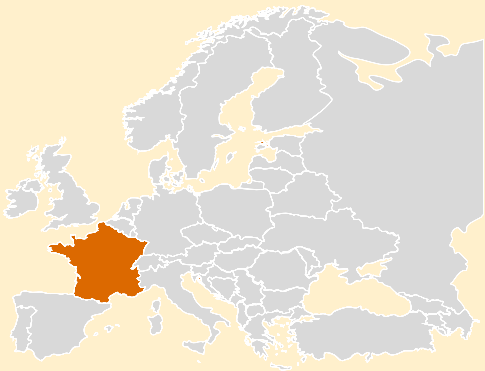
Added value of financing

Contribution to costs of line renovation. Added value also in terms of showing commitment on the part of the State to implement national policies on promoting rail freight transport and environmental protection measures.

Impact of investment

- Contribution to the local and national policies on increasing rail freight to 25% by 2022 and fostering territorial development (Grenelle Guidelines);
- Boost local economy and employment;
- Reduce environmental negative effects.

Case Study: Line Peyrieu - Virieu



The line between Peyrieu and Virieu (22 km) was closed by RFF decision in 2009 after more than 50 years with no proper renovation and very little maintenance. On this line, one private siding with about 70.000 ton/year traffic and a velo rail touristic service on a 2.5 km section of the line. In 2012, the Region Rhône Alpes and local authorities decided to ask for a scenario to reopen the line after its renovation.

Investments: The scenario proposed by the former RFF was to renovate 17/22 km of track for € 5,37 million.

An agreement was signed between the parties according to which the proposed scenario would be implemented, Terre d'Alliances providing € 1.85 million, RFF providing materials such as rails and sleepers, and other public entities providing the necessary complement. The agreement obliges RFF / SNCF Réseau to maintain the line over the first 5 years after reopening whatever the level of traffic. From the sixth year after reopening of the line, SNCF Réseau is obliged to maintain the line only if level of traffic is more than 100,000 tons/year , which is not the case currently. The agreement stipulates there is a guarantee of operations on the line for 15 years providing the level of traffic is more than 100,000 ton/year after the sixth year.

What would have happened without the financing?

If no agreement had been reached, the line would have remained closed.

Added value of financing

Contribution to costs of renovation of lines;

Added value also in terms of showing commitment on the part of the region to support activity and tourism, promoting rail freight transport and environmental protection measures.

Impact of investment

- Contribution to the local and national policies on increasing rail freight to 25% by 2022 and fostering territorial development (Grenelle Guidelines) by keeping at least 70.000 ton/year on rail;
- Support local economy and employment;
- Reduce environmental negative effects.

A7. Combining different support mechanism

The last-mile programme should provide the possibility to combine the various forms of support available*, thereby maximising the instrument's overall effectiveness and guaranteeing the result.*

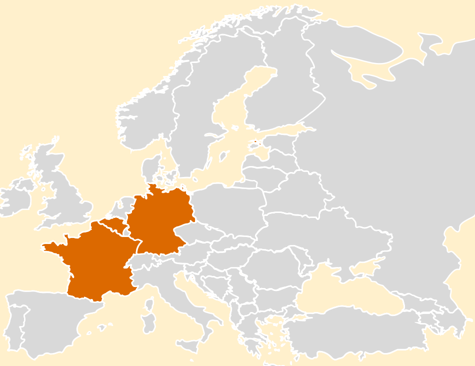
- A synergic use of the various forms of support made available by the last-mile programme may firstly speed up the process by which the required financial critical mass is achieved to support the infrastructural investment.

- Combining the resources would not only allow to maximise the leverage of EU/National public contribution, but also to attract support from private sectors, who have demonstrated a growing interest in infrastructure debt.

- The possibility to combine different forms of support – also from public institutions – reduces the relative risk and financial effort carried out by lenders, encouraging privates to go forward with the construction/upgrade of rail sidings and the commitment of own resources even in case of capital-intensive investments.

- The wider the choice of support instruments to be combined together, the higher the possibility to provide an assistance tailored to the specific circumstances and technical requirements of the project.

Case Study: LHT Intermodal project



Description: The "LHT Intermodal" project consists of building a new rail link to carry chemicals among the Port of Antwerp on the one hand, and local and international customers and suppliers in Germany, France and the Netherlands, on the other hand. The project entails building a new logistics tank terminal for storage and transhipment of liquid chemicals in the Antwerp port area on the left bank of the Scheldt. This will enable freight flows to be consolidated on a single terminal with sea access plus a rail (last-mile) connection to the European hinterland.

Time frame: 2014 –

Investments: The total investment amounts to € 24.596.815. The costs were co-financed by the EU from the Marco Polo programme (8%). The rest of the project costs are covered by Flemish Government funding (2%), private investment (45%) and a bank loan (45%). The project represents a good example of how to use EU funds to co-finance the development of last-mile infrastructure. What is remarkable in this case is the combination of financing from several sources, with private investment and bank loan amounting to 90% of the total project costs, and with the EU funding playing a supporting/complementary role.

What would have happened without the financing?

Considering that only 8% of the costs of this project were co-financed by the EU, it only played a supporting/complementary role in this project. Since 90% of the costs were covered through other means, it is likely that the project would have been implemented in similar ways also without the EU funding.

Added value of financing

Due to the relatively small share of EU funding, its added value is also more limited. However, by granting this funding, the European Commission also approved the project to build new logistics tank terminal, which gives a feeling of stability and trust to stakeholders and investors, which can lead to projects that are more similar.

Impact of investment

- Improved inter-modal transport of liquid chemicals;
- Reduced negative environmental effects;
- Improved logistics and transport systems.

A8.Setting-up an appropriate reward mechanism

It is recommended to provide a last-mile support programme with an appropriate reward mechanism *in order to ensure the maximum road-to-rail modal shift success both in terms of reduction of congestion and greenhouse gas emissions. The support, either financial or nonfinancial, should be performance-related and commensurate to the modal shift effect expected from and/or generated by the investment.*

The reward mechanism should consider the following aspects:

- To obtain support in case of new construction, the beneficiary should substantiate the expectation of moving a certain average transport volume per year through the siding;
- When upgrading an existing siding, the support provided should be determined depending on the additional transport volume generated on the infrastructure;

- Transport volume can be measured in tonnes per year for freight traffic volume or in tonne kilometres per year for freight transport performance;
- In case of new siding construction, the average transport volume guaranteed by the beneficiary should be monitored ex-post by a third-party/independent authority for a set number of years since the start of operations;
- In case of siding upgrade, the monitoring activity should be performed also ex-post, in order to verify whether additional transport volume was generated on the siding or not.

The Swiss dedicated last-mile programme

In Switzerland, the **calculation of financial support** provided by the last-mile dedicated programme to the development of private sidings is a **function of the volume to be transported** on them.

More specifically, the **subsidy to the construction of private sidings increases** – in percentage of eligible costs – **with the increasing ratio between the tonnes and wagons transported** on the newly-built infrastructure as shown below:

- Up to 12,000 t or 720 wg. per year → 40 % subsidy
- Up to 75,000 t or 4,500 wg. per year → 45 % subsidy
- Up to 400,000 t or 24,000 wg. per year → 50 % subsidy
- Up to 900,000 t or 54,000 wg. per year → 55 % subsidy
- More than 1,400,000 t or 84,000 wg. per year → 60 % subsidy

For **the extension and renewal of sidings**, the **additional volume** to be transported is the **key driver** for defining the amount of financial aid. In particular, the **difference between the average volume transported during the last three years** prior to the intervention and the **one expected after** it is considered.

If the volume **remains unchanged,** the financial aid **will correspond to 40%** of the eligible costs. It will increase **by 1% for any 5% increase** in the volume to be transported.

If the eligible costs are above average, financial aid **might be increased by a maximum of 5%**, provided that the applicant cannot influence the causes of higher costs (e.g. they shall be due to municipal taxes, length of the sidings, geology, etc.).

In providing additional resources in support of last-mile investments, ***the "polluter-pays" and "user-pays" principles should be applied*** *to raise funds in order to offset distortions generated by asymmetric taxation across transport modes, thereby promoting the development of more environmentally friendly ones.*

- External benefits of sustainable infrastructure could be rewarded and monetised through cross-financing between different modes of transport (e.g. using road charges for the funding of investment in infrastructure for sustainable transport modes, such as rail sidings projects).
- A dedicated "sustainable transport" fund could be created to support investments in last-mile projects, partially stemming from taxes on transport infrastructure characterised by a low degree of environmental sustainability (e.g. highways, airports, etc.).
- Revenues from the Emission Trading Scheme (ETS) – the EU system developed for trading greenhouse gas emission allowances with the aim of combating climate change – could be used for last-mile projects.

Likewise, the scope of the Climate Awareness Bonds issued by the European Investment Bank could be spread out in order to include sustainable transport investments. As a result, the Climate Awareness Bonds could be used for raising funds from fixed income investors in order to support the EIB in lending for last-mile projects.

A9. Monitoring outcomes and guarantee instruments of the support programme

*For monitoring the performance of a specific programme (or a package of actions), it is essential to **define and set up** (minimum) **conditions and performance to be guaranteed** according to the reward mechanism in order to check and verify the results against targets expected (specifically, in terms of road-to-rail modal shift). In case of underperformance, incentive mechanism should be interrupted or funding should be claimed back (in proportion to the completion of the project).*

- At country level, the monitoring time frame of a specific programme, or a package of actions, needs to assess the railway transport performance on the siding.
- A granting authority should check the compliance with the annual transport service target - in the identified monitoring time frame.
- In case of non-compliance with the transport target, the funding has to be repaid back in proportion of the completion of the project. The applicant should provide a bank guarantee or an equivalent warranty to secure the repayment of the obligation.
- Full or partial repayment of the grant is required when, within the timeframe defined at country level, the siding is not operating (despite the authorization) or the minimum condition defined (i.e. traffic volume - tonnes/year or wagons/year) is not reached.
- Except for cases of permanent abandonment of a siding, an annual interest rate is charged on the amount to be repaid.
- Specific **Key Performance (result) Indicators** should be identified, as examples:
    - (1) Total tonnes*km using rail transport due to the new last mile infrastructure;
    - (2) the **Wagon Filling Rate** (ratio between the total tonnes*km and the total capacity - calculated as average wagon capacity * average number of wagons per train*km);
    - (3) the *average loading factor of wagons + fraction of wagons running empty*;
    - (4) ratio between laden and empty wagons in trains.

A10. Ex-post evaluation

*The involvement of the infrastructure managers in conducting an **ex-post monitoring of the investment** is an important point to better understand the efficiency and the effectiveness of the investment.*

The ex-post evaluation[83], regarding a last-mile support programme, has the following primarily goals:

- measure the effectiveness: the impacts of the support programme (in terms of wagon filling rate, growth rate of the rail freight transport, etc.) are compared with the forecasted ones or the achievements are compared with initial objectives in order to give a measure of the utility of the project;
- provide elements to improve the ex-ante assessments of future interventions: reassessment of ex-ante appraisal is extremely informative and useful for understanding whether the conceptual forecasting model adopted before project implementation was adequate to support the investment decision. Furthermore, it allows understanding where the efforts in improving the quality of project appraisals should be addressed;
- collect relevant information about past programmes to be used as reference class forecasting;
- provide incentives for better and more accurate ex-ante analysis by giving publicity to the real achievements of the projects.

5.1.2. B) Improving existing support programmes

Additionally to the guideline previously outlined for the development of new last-mile support programmes, there are further **practices to bring about specific operational improvements of the existing programme**. These practices are mainly based on the needs and requirements of the beneficiaries (in

[83] Guidelines for ex-ante and ex-post evaluation, EVATREN, 2008

particular national authorities, infrastructure managers, industries, port authorities, etc.) of the support programme (see details included and summarised in Annex A).

B1. Investing in innovation systems

More focus on innovation-related investments rather than grants/subsidies for infrastructure *could help achieve capacity levels. At the same time, using information systems could improve the performance of the railway infrastructure and last-mile development.*

- Through integrated information systems, the operational parameters can easily be exchanged between systems of different transport modes in order to optimally organize the freight transportation by the intermodal operators.

B2. Making the procurement procedure more efficient

Procurement procedures should be optimised*, to strengthen the attractiveness of the project vis-à-vis the private sector, to encourage it to invest in the project.*

- An appropriate risk transfer system, together with a clear contractual framework, will provide benefits across a number of fronts: enhanced time-to-market, more effective cost control, mitigation of the political/regulatory risks for investors;
- The implementation of a life-cycle approach able to internalise positive and negative externalities, in addition to a pro-active participation of all the stakeholders involved in the project, is expected to facilitate, speed-up and maximize the generation of project benefits;
- The decision-making process should be streamlined while ensuring the overall quality of private-public expenditures and the timely delivery of the project.

B3. Streamlining permit procedures

Cumbersome permit procedures, directly or indirectly linked to the infrastructural development of last-mile projects, should be simplified *in order to reduce the administrative-related risks, which in turn will ensure the financing and timely implementation of the project.*

- A "one-stop-shop" may be set up where applicants for support under the last-mile programme can efficiently handle all administrative procedures;
- An environmental impact assessment of the project should be carried out prior to the procurement and financial structuring phases, to avoid risk;
- All national/regional authorities involved in the appraisal of the projects should gather on regular basis to evaluate the interventions submitted by the interested parties;
- Appropriate measures should be deployed in order to reduce potential blocking appeals, including the following measures: single step for appeals, restrictive conditions to stop the project, limit to the period of time for the judicial/administrative action and automatic procedures for the substitution of non-compliant contractors;
- Appropriate measures should be developed in order to reduce the administrative burden for ownership and management of last-mile infrastructure. This aspect would not focus on the investment phase, but on the operational phase.

B4. Providing assistance to project promoters

***Assistance should be provided, through ad-hoc technical teams**, to both public and private sector promoters, with regard to structuring and delivering last-mile infrastructure projects. Improving the project's overall quality is expected – inter alia – to attract, for instance, private finance through the adoption of PPP models.*

- Awareness on the potential of PPP models to develop last-mile projects should be raised among public and private stakeholders;
- Since the use of PPP procurement models is limited in some countries due to the lack of technical capacity, assistance should be provided in order to bridge the skills gap;
- Technical experts should support project promoters with regard to individual operations as, for instance, the customisation of financing schemes to the needs of the project, the provision of different scenarios in terms of risks, costs and complexity or the most effective way for sourcing additional co-lenders.

5.1.3. C) Monitoring phase of a general Last mile support programme

As anticipated in the previous sections, it must be stated that the availability of data and information at EU level - particularly for number private and public sidings - is rather limited.

The monitoring of an all embrace Last Mile Infrastructure Programmes should be planned as a **cyclical and periodical process**. Over time, operational objectives may be fine-tuned, performance may be measured and strategies may be refined to ensure they are focusing on the key priorities and the most relevant achievable results. This phase is different from the monitoring described into the previous point A9 in which the focus is on a specific support programme or a package of actions about last mile in order to measure the its/their performance.

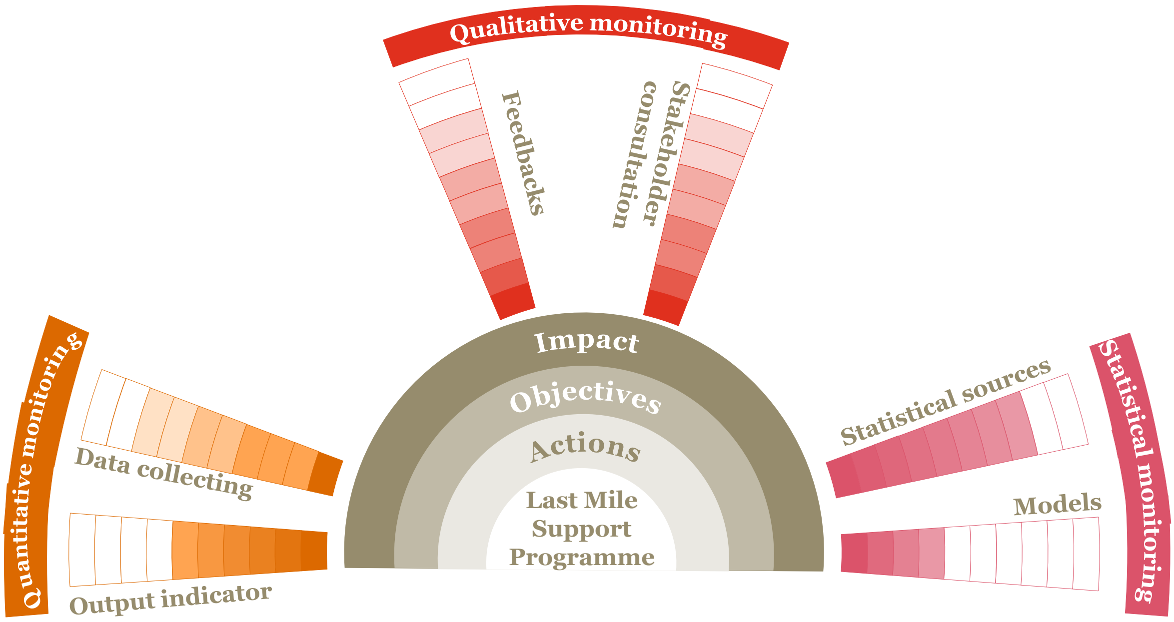
On the contrary, this monitoring phase is essential:

- to develop an **articulated decision support system of the overall LMI support programme (at country/Regional level)**;
- to provide a suitable database to the evaluation phase.

The monitoring phase should be structured into the following three activities:

- **monitoring at quantitative level**: to analyse the last mile support programme in quantitative terms;
- **monitoring at qualitative level**: to collect points of view and feedbacks from all the involved stakeholders;
- **monitoring at statistical level:** to gather and analyse macroeconomic data functional to the investments in last mile infrastructure.

Figure 66 - Monitoring approach



Quantitative monitoring

The quantitative monitoring enables to check exactly the implementation of the last mile support programme thanks to specific indicators. The main objectives of the quantitative monitoring are:

- To ensure comprehensive, accurate, reliable and timely data;
- To analyse the implementation of the support instrument in order to detect some issues;

- To support the body in charge to understand the development and the percentage of completion of the investment and eventually correct some issues;
- To consider a *reporting* system in order to inform all the involved stakeholders.

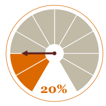
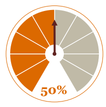
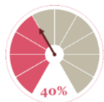
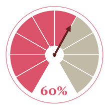
To do so, it is necessary to involve at least the following stakeholder clusters:

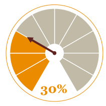
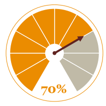
- Infrastructure managers;
- Industries;
- Port authorities;
- Logistic nodes/Freight villages' managers;
- Rail road terminal managers;
- Railway associations and;
- General associations of each specific cluster above mentioned in order to enlarge the sample of analysis.

A **strong stakeholder consultation with specific on line questionnaires (see Annexes A and B) and targeted interviews should be conducted**. The main characteristics of the consultation should be defined within a **Last Mile Monitoring Plan (LMMP)** in which the quantitative data, the sources adopted and the stakeholders involved should be reported.

The LMMP would be periodically updated with **several key output indicators.** An example of which is reported in the following table:

Table 52 - Examples of monitoring key indicators

Indicator	Description	Unit	Degree of realization
Current Status & Implementation of LMI	New railway links	km	
	Upgrading of existing railway links	km	
	Sidings connected to the main network railway	number	
	Stations with public sidings	number	
	Intermodal terminals	number	
Performance and effectiveness of the LMI support programme	Modal shift from road to rail	%	
	Total freight flows	additional transported tonnes	

Indicator	Description	Unit	Degree of realization
Impact of the LMI development programme	Pollutant emissions (air pollution, greenhouse gases, noise)	g/train*km, g/train*tonnes €/train*km	
	Transport time	minutes, hours	

The data collected will be analysed and used to organise a specific **Last Mile Infrastructure Data Base (LMDB)** in which the following information will be also included:

- Forecasted investments in last mile infrastructure;
- Forecasted modal shift from road to rail freight transport.

Qualitative monitoring

The qualitative monitoring aims to collect points of view and general feedbacks from all the involved stakeholders about the perception of the adopted last mile support programme. The main goals of the monitoring are to:

- Complete and enrich all the data collected during the quantitative monitoring;
- Support the body in charge of the last mile support programme to obtain a feedback from the main actors involved.

The qualitative monitoring should be developed with **specific questionnaires and targeted interviews.** The following table presents a minimum set of questions to be addressed to all the stakeholders involved.

Table 53 - Qualitative monitoring: questions matrix

Driver	Data/Questions
Stakeholder information	*Geographical area(s) where the organisation operates (multiple choices can be done).*
	Sector(s) in which the organisation is active (multiple choices can be done).
	Category (ies) the organisation belongs to.
Overview of the last mile support programme	*Application process is been: suitable and easy?*
	Impact of the programme or instrument
	Increase of the flow of goods transported by rail
	Positive impact(s) of the scheme
	Recommendation on the scheme (and best practice example)
	Development measures (also without the funding provided by specific support programme)
	Improving the scheme?
	Negative impacts of the programme

In general, the questionnaires should be tailored based on the specific stakeholder cluster intended to be addressed. On the contrary, the interviews will be conducted mainly with those stakeholders responsible for the development, organisation and management of support programmes for investment in last-mile infrastructure: Member States and/or the authorities in charge. This ensures that all the relevant qualitative information not covered by the questionnaires are successfully collected.

All the data collected will be used to update the above-mentioned Last Mile Infrastructure Data Base.

Statistical monitoring

The statistical monitoring of specific variables aims to analyse all the relevant statistical sources, at specific territorial levels (NUTS2 and NUTS3), in order to evaluate the effects and the effectiveness of the last mile support programme adopted. In particular, these variables could influence the right implementation of the support instrument positively or negatively. In the following table, an example of the main variables to be taken into account is reported:

Table 54 - Example of statistical indicators

Source	Main indicators	Unit	Sectors	Scopes
National Statistics Offices	• Gross Domestic Product • Number of enterprises • Number of employees • Turnover • Industrial production indices • Industrial density	• € (million) • People • People • € (million) • Annual Δ% • Number of enterprises/1.000 km	• Automotive, Cement, Cereals, Chemicals, Coal, Construction, Food, Metals, Minerals, Paper, Retail, Silica, Wood	• NUTS 2 • NUTS 3

5.2. Recommendation for the Last-mile infrastructure Development Plan

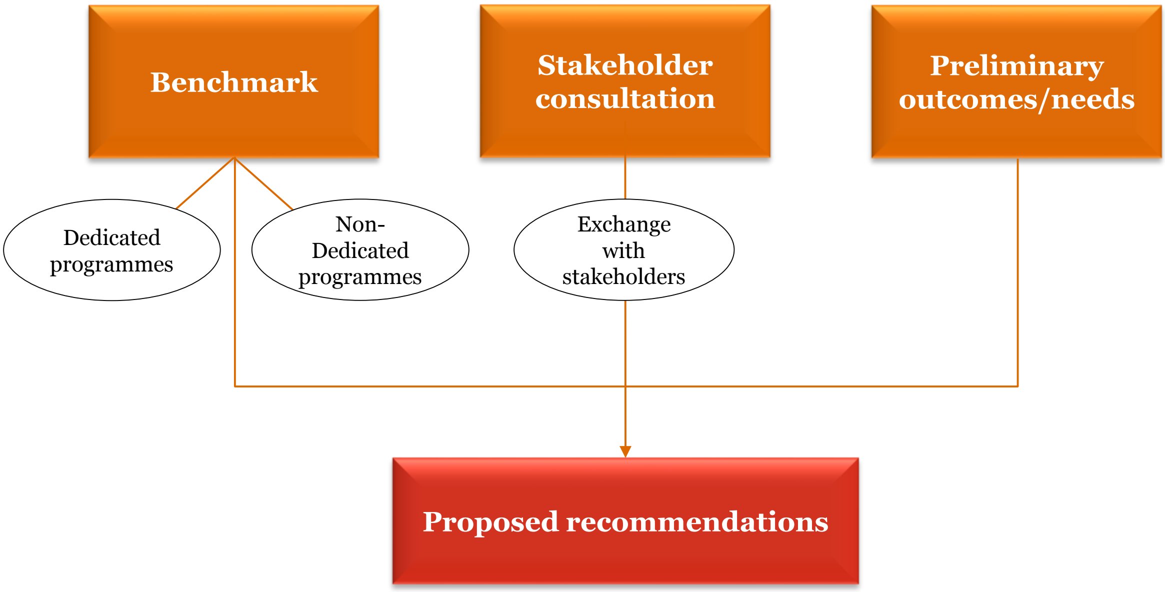
In this section, practical **recommendations on the Last-mile infrastructure Development Plan are presented, in particular related to governance system**. The recommendations have been developed in accordance with the current EU regulatory framework and result from:

(1) the analysis of the existing last-mile dedicated programmes/instruments and other programmes/instruments at EU and country level,

(2) an extensive stakeholder consultation, and

(3) the findings from chapter 2.2.

Figure 67 - Recommendations development flow chart



Last-mile support programmes may

- Have a different geographic scope (from project-based support systems to country-wide programmes)
- (Coherently) be planned (also through specific and structured "planning instruments"), managed and coordinated by different players, at country, regional or local level.

The rationale on which the scope and management structure depends on is based on the following conditions, specifically:

- **Regulatory aspects** and the **responsibility allocation scheme** in place (basically at country, regional and local level);
- **Geographical coverage** and **scope** of the specific last-mile support **programme**;
- **Phases of the support programmes** in place (from strategy and planning phases, to management, monitoring and control ones);
- **Nature of the support** needed;
- Industrial density and potential demand for rail freight transport services;
- Freight traffic generators (e.g. number of factories, large warehouses, terminals etc.) nearby the railway line.

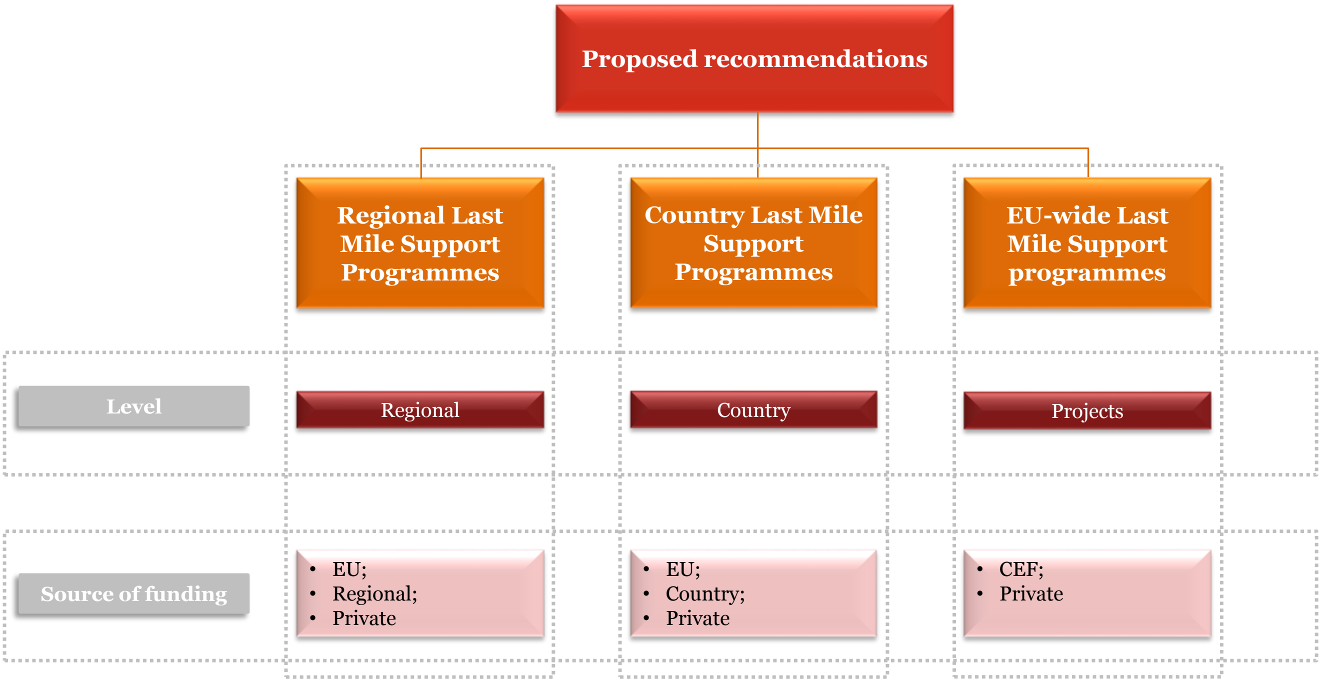
The following chart summarises the recommended programmes, as described in the following paragraphs. According to our preliminary findings, **three different support instruments** can be developed to support the construction and renewal of railway last miles infrastructure:

I. **Country-wide support programmes**, similar to the ones emerging from the benchmarking analysis of Germany, Austria and Switzerland;

II. **Regional support programmes** - a concept originally developed in this study - designed for regions within larger countries with logistic and economics disparity across the different areas. In such contexts, a territorial level programme management is paramout to ensure the necessary understanding of local conditions;

III. **EU-wide support programmes,** which is already possible but – according to several railway undertakings and logistic nodes' managers – there is yet need for effort on tailoring such support on specific characteristics of last-mile projects.

Figure 68 – Last-mile support programmes



5.2.1. Country-wide Last Mile Support Programme

The proposed recommendations in terms of main actions to be developed for the Countrywide last-mile support programme are outlined in the following table. As stated in the previous sections, such programmes are similar to those emerging from the benchmarking analysis from Germany, Austria and Switzerland. These have existed for several years with significant achievements (simplicity of utilisation; high rate of successful application and used of available funds), contributing most likely to the important market share rail still has in those countries.

Table 55 - Country-wide Last Mile support programme recommendations

Main actions to be developed	Recommendations
Scope	• **Countries with relatively homogeneous industrial and logistic structure** where standardized support programmes managed centrally may be effective
Definition of the mainstays of the support-policy	• Each Country should define, within their own **"National transport Master Plan"**, the **criteria to identify the projects** with the highest EU added value deserving to receive funding (e.g. bridging missing links, enhancing rail interoperability, promoting an environmentally friendly transport mode, etc.); • At this-high level plan, both **new railway last mile infrastructures** and those in need of **rehabilitation/upgrading** are identified as eligible for the support; • Eligible last miles are both the ones connecting TEN-T Core Network nodes as well as other important traffic generators; • **Traffic management systems for last miles** shall be eligible investments; • The co-financing might encompass also equipment such as "**rail connected warehouses**" in order to consolidate the rail freight traffic vs the road transport (to be decided at the country level); • Each country should develop the operational/practical programmes and in such a way the stakeholders might apply to EU co-funding in order to improve the last-mile links to industrial sites, ports and logistic centres; • Each support instrument should consider the "industrial density" of the Country; • National co-funding programmes for the development and maintenance of private sidings should be encouraged through the exchange of best practices
High-level definition of the operative steps of the support policy	• Each country should encourage co-funding programmes for the development and maintenance of private sidings with high EU added value; • Each last-mile support programme for countries should not have unjustified selectivity issue. Sometimes the support schemes are weakened if they, referring to market or land segment, are not objectively justified. Thus, eligibility criteria shall be fully justified in a transparent way; • Each country should encourage synergies between different development plans (e.g. industrial, economic growth and railway transport system development plans) in order to support all the subjects that will contribute to an environmentally friendly increase of transport volumes carried by rail.
Selection of the forms of benefit of the support programmes	• Each country should recognize a contribution to the EU added value with high impact to the last-mile transport services and definitive and replicable outcomes for the medium/long term by **providing tax incentives** to private companies investing in last-mile projects; • Countries, potentially supported by the European Commission, should also **share best practices concerning tax incentives** to attract last-mile users. • Each country should recognize a contribution to economic growth, congestion reduction and greenhouse gases emission neglect by providing tax benefits to private companies investing in last-mile projects.
Selection of the forms of financing of the support-programmes	• Each last-mile support programme in countries may be co-financed by EU; • A major part of the funding to build, renew and upgrade/extend the last-mile infrastructures should come from national budgets and private investors. • Each country should introduce a dedicated "sustainable transport" fund in order to support investments in last-mile projects, partially stemming from taxes on transport infrastructure characterised by low environmental sustainability (e.g. highways, airports, etc.)

Main actions to be developed	Recommendations
Development of a guide about realization of last-mile links	• Each country should develop a **"Practice guide about the project and administrative processes to realize a last-mile link"** in order to disseminate best practices for last-mile links in terms of size, investments, technologies, etc. and to clarify the required bureaucratic steps (e.g. administrative processes)

5.2.2. Regional Last Mile Support Programme

For the regional last-mile support programme, the following table summarises the proposed recommendations in terms of main actions to be developed.

Table 56 - Regional Last Mile Support Programme recommendations

Main actions to be developed	Recommendations
Scope	• **Regions with significant density of traffic generators** (factories, agricultural and industrial products' warehouses, rail-road terminals, ports) in large countries where national programmes may be difficult to manage or less effective
Definition of the mainstays of the support-policy	• Each region should develop a "Land planning framework" ensuring compliance with the National Plan and establishing – among the others – clearly the regional strategy for the freight demand management. • In coherence with such framework, specific focus should be dedicated to the last-mile infrastructure defining a **"Last-mile infrastructure development plan"** (LMDP) in which – among others - the criteria to identify the projects and the time frame for funding are clearly specified; • The criteria should be in line with the practices described above and guidelines for country-wide programmes, i.e. o Eligible last miles are both the ones connecting TEN-T Core Network nodes as well as other important traffic generators; o **Traffic management systems for last miles** shall be included among the eligible investments; o The co-financing might encompass also equipment such as "**rail connected warehouses**" in order to consolidate the rail freight traffic vs the road transport (to be decided at regional level); • Each region should involve all the stakeholders (e.g. industries, operated in a specific production sector and located in a given area) in order to clearly identify – through a "bottom-up approach" - the right needs to build, extend/modernise and reactivate the railway sidings.

Main actions to be developed	Recommendations
Definition of the operative steps of the support-policy	• Each region should develop **"Regional Supporting Schemes"** with high EU added value, in which the support programmes are managed by the territorial units (e.g. NUTS-2), in line with the "Last-mile infrastructure development plan" mentioned above; • Each regional supporting scheme should identify the specific geographical and administrative areas or production districts within the region where last-mile infrastructure shall be developed but requires support; • Each regional supporting scheme should be defined depending on the density of the industrial sites, in particular for the districts located along the TEN-T corridors crossed the territory; • Each regional supporting scheme should be developed according to the needs of stakeholders and in accordance with the regional plan; • Each regional supporting scheme should be monitored to match the findings of the scheme to the goals and objectives (see point A7 of Planning and monitoring of new support programme)
Selection of the forms of benefit of the support-programmes	• Each regional supporting scheme should be possibly **combined with tax incentives** (for instance, for new industrial zones that include a rail connections); • Each pilot regional scheme should use the existing tax incentives for attracting investments (e.g. reducing or eliminating local taxes)
Selection of the forms of financing of the support-programmes	• Each pilot regional scheme should be co-financed both from Member State and EU

5.2.3. EU-wide Last Mile Support Programme

This scheme should be the touchstone of all the Last Mile Development Plans both at Country and at Regional level. The following table summarises the proposed high recommendations in terms of main actions to be developed.

Table 57 - EU Last mile support programme recommendation

Main actions to be developed	Recommendations
Scope	• This dedicated support programme may be managed under the CEF funding **(also in specific Calls of Proposals) and should involve all the beneficiaries operating within logistic nodes, freight villages, ports and railroad terminals.**
Definition of the mainstays of the support-policy	• Enhancing the interoperability of the transport system; • Increasing the modal shift from road to rail; • Ensuring the accessibility of transport infrastructure; • Extending/modernising and reactivating the railway sidings. • Promoting clean freight transport; • Increasing rail safety through maintenance of railway infrastructures; • Creating multimodal freight corridor structures
Definition of the operative steps of the support-policy	• As proposed by the 4th Railway Package, EU coordination committees should be implemented with authorities at country level and determine the development, maintenance, and investment needs of last-mile infrastructure

Main actions to be developed	Recommendations
Selection of the forms of benefit of the support-programmes	• EU should provide fully support if the objective is to develop freight flows within the EU space.
Selection of the forms of financing of the support-programmes	• EU should co-finance the development and maintenance of last-mile rail infrastructure through CEF and the structural funds; • EU can help in guiding cross-border coordination and contribute EU funding on cross-border projects and on those with the highest European added value.

Taking into consideration the complexity of the rail freight market and the need of investments, stated by the stakeholders, in the rail last-mile infrastructure, the following further recommendations move towards a comprehensive approach of policy and legislation of the adopted measures to support the investments:

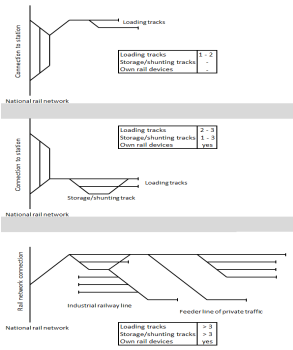
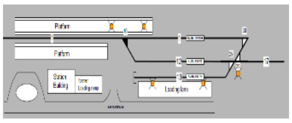
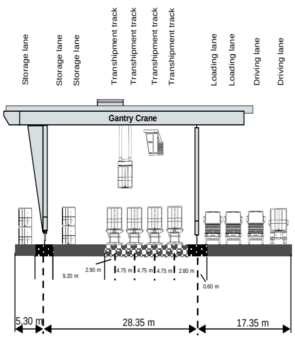
- **To promote dedicated last-mile programmes by providing Guidelines** (similar to the one on State Aid to railway undertakings), as well as by disseminating best practices and success stories in relevant context (TEN-T days, EU Rail Freight Days, etc.);
- **To verify the conditions ensuring that dedicated programmes will meet State Aid regulation's prescriptions** and provide guidance to obtain clearance at the programme level (not on individual projects);
- **To consider earmarking of specific funds** under CEF and Cohesion Funds to co-fund Regional and Country dedicated last-mile programmes, to be chosen under a competitive approach (call) aiming at selecting the proposals with higher potential benefits and more developed background;
- **To support and monitor coherent development of last-mile infrastructure along Core Network Corridors/RFCs** through the existing regulatory framework (e.g. Core Network Corridor, RFC management bodies and committees).

5.2.4. Recommendations on specific sources of investment

The analysis of both the dedicated support programmes and the needs stated by the stakeholders for investments in last-mile infrastructure has allowed defining some specific recommendations to be tailor made according to **the types and the layout of the last-mile infrastructure and the size of the project**.

The following table summarizes the best form of financing for each last-mile infrastructure scheme on the basis of the above-mentioned criteria.

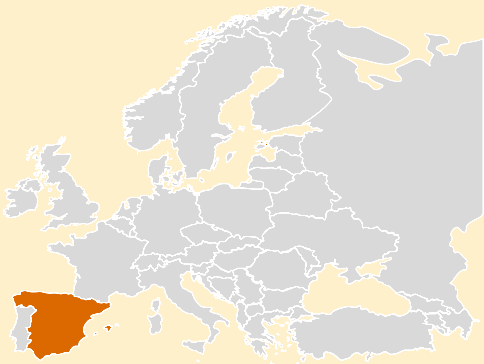
Table 58 - Forms of financing in last-mile infrastructures

<table>
<tr><th>Types of last-mile infrastructure</th><th>Layout of last-mile infrastructure</th><th>Project size</th><th>Form of financing</th><th>Description of the financing</th></tr>
<tr><td>Private sidings</td><td>
</td><td>Small</td><td>Non-repayable grants</td><td>According to the three identified dedicated support instruments (Austria, Germany and Switzerland), the minimum project threshold is very low (from € 15,000 to € 28,892);
In Austria and Germany, the maximum project threshold is based on the type of intervention (e.g. in Austria new construction of sidings is financing by € 2.5 million while in Germany is € 8 per additional tonne/year or € 32 per additional 1,000 tonne-km/year. On the contrary, the extensions/renewal of sidings is financing by € 2 million in Austria and € 6 per additional tonne/year or € 24 per additional 1,000 tonne-km/year in Germany.</td></tr>
<tr><td>Freight station</td><td></td><td>Medium</td><td>Non-repayable grants</td><td>The infrastructure manager is responsible to coordinate the investments (through different investment projects) in rail last-mile infrastructure</td></tr>
<tr><td>Rail-Road terminals/Ports</td><td>
</td><td>Large</td><td>European Fund for Strategic Investments</td><td>The European Fund for Strategic Investments (EFSI) should co-finance the development and maintenance of rail last-mile infrastructure to Core network nodes (rail-road terminals/ports);
Since EFSI guarantee is portfolio-based, it covers hundreds of projects. This means that the EFSI instrument can be used, in particular, to finance cross-border projects both at EU and Country/Regional levels.</td></tr>
</table>

5.2.4.1. Case study: EFSI guarantee for Spanish ports accessibility

In this paragraph, a special focus is dedicated on the **European Fund for Strategic Investments** (EFSI) in rail links to Core Network nodes. The following box describes a specific case study on EFSI guarantee for Spanish ports accessibility.

Case Study: Spanish state fund for ports accessibility



Description

The project, approved on December 2015, consists of a framework loan to fund **rail** and road **access investments** in state-owned ports in Spain through a State Fund - "PAF" (Port Accessibility Fund). The project will help to improve land connectivity in key ports all located in the TEN-T Network. The operation will be a natural continuation of the extensive support provided by the EIB to the development of this seaport network over the last years.

The planning framework for such investment programme is laid out in the national strategic plan PITVI (*Plan de Infraestructuras, Transporte y Vivienda - Infrastructure, Transport and Housing Plan*). A strategic environmental assessment (SEA) was carried out in accordance with Directive 2001/42/EC.

As part of the approval process, both the PITVI and the associated environmental impact studies were subject to public consultation in the first half of 2014 including with representatives of the national government, ministries and agencies, regional and local governments, non-governmental organisations and civil associations and individuals. For its part, the Master Plan of each Port Authority has to go through a public consultation process. Additionally, annual business plans of the Port Authorities are accompanied by a sustainability report, which is publicly available. Depending on the level of environmental assessment, individual schemes may also require public and stakeholder consultation, in conformity with the relevant EU Directives and Spanish Legislation.

Investment

EFSI financing: **€ 105 million**

Related total EFSI investment: **€ 425,36 million**

Proposed EIB finance (approximate amount): **€ 250 million**

Total cost (approximate amount): **€ 1.200 million**

Impacts

Given that the project predominantly targets railway components, it will support sustainable transport by increasing the modal share of rail in freight transport from/to ports. In addition, the project is expected to have some contribution to climate change mitigation by reducing CO2 emissions due to such modal shift.

By improving land access to the main ports in Spain, the project will enhance efficiency of their supply chain, making the national port system more competitive and attractive to the market. Moreover, the investment programme in port accessibility supported by the Bank's financing is remarkably biased in favour of rail investments, thus incentivizing modal shift from road to rail transport. Both factors will contribute to a more sustainable transport system in the country.

The Spanish case study showed that **EFSI guarantee may be an important support instrument to cover several programmes of investment in rail last-mile infrastructure**.

5.2.5. Preparation and dissemination of a State aid regulatory guide

The **Regulation N. 1315/2013** requires the development of the comprehensive network in urban nodes, in accordance with Union aims regarding sustainable urban mobility, as those nodes are the starting point or the final destination (last mile) for passengers and freight moving on the trans-European transport network and are points of transfer within or between different transport modes[84].

To this purpose, the development of the **Countrywide** last-mile support programmes and **Regional** last-mile support programmes as previously described, funded by public bodies, may be conceived as **State aid**.

In the following table, a list of the main reference documents at EU level is reported.

Table 59 - Reference documents

Document	Description
The Treaty on the functioning of the European Union	*The Treaty organises the functioning of the Union and determines the areas of, delimitation of, and arrangements for exercising its competences*
Regulation (EU) N. 1315/2013	*The Regulation is on Union guidelines for the development of the trans-European network and repealing Decision N.661/2010/EU*
Community guidelines on State aid for railway undertakings (2008/C 184/07)	*Community guidelines on State aid for railway undertakings clarify the rules applicable to public funding for this type of enterprise*
Communication from the Commission (2014/C 188/02)	*Criteria for the analysis of the compatibility with the internal market State aid to promote the execution of important projects of common European interest*

As reported in the **Article 107(1) of the Treaty on the functioning of the European Union (TFEU)**, *any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market.*

State funding meets the criteria in Article 107(1) of the Treaty constitutes State aid and requires notification to the Commission by virtue of Article 108(3) of the Treaty.

The concept of State aid is better clarified into the **Community guidelines on State aid for railway undertakings**. The guidelines, indeed, specify that where **public financing of railway infrastructure** constitutes aid to one or more railway undertakings, it **may be authorized** on the basis of **Article 93** (ex 73) **of the Treaty**, if the infrastructure in question meets the **needs of transport coordination**. In particular, the eligible costs are determined compared with the following:

- As regards **aid for rail infrastructure use**, the eligible costs are the additional costs for infrastructure use paid by rail transport but not by a more polluting competing transport mode;
- As regards **aid for reducing external costs**, the eligible costs are the part of the external costs which rail transport makes it possible to avoid compared with competing transport modes;
- As regards **interoperability aid**, the eligible costs cover, to what extent they contribute to the objective of coordinating transport, all investments relating to the installation of safety systems and interoperability, or noise reduction both in rail infrastructure and in rolling stock.

[84] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R1315

5.2.5.1. Case study: State aid for last mile infrastructure in Hungary

Case Study: State aid for last mile infrastructure in Hungary

Description: In 2008, the Hungarian authorities notified to the Commission the "**First last mile infrastructures and intermodality**" aid scheme in accordance with Article 108(3) TFEU. The measure concerned two general objectives:

- Extension, modernisation, and upgrading of the existing road, rail and inland navigation infrastructure;
- Strengthening of the intermodality.

In particular, the aid scheme covered the following points:

- The development of the external transport infrastructure (road connections, rail connections and junctions) of intermodal and regional logistics centres and regional commercial airports;
- The development of business parks with the aim of intermodality by constructing and developing railway connections;
- The development of external transport infrastructure for freight forwarder ports.

The aid was available for business corporations, cooperatives, local governments, association of local governments, state budgetary institutions and the consortia thereof, who had their seat in Hungary or in a country participating in the Agreement on the European Economic Area and had branch office in Hungary. Furthermore, the beneficiaries were selected as a result of an open, transparent and non-discriminatory public tender.

Time frame: 2008 –

Investments: The original total budget of the scheme was € 63.7 million but due to the economic and financial crisis, the Hungarian authorities reduced the budget to € 51.4 million and was set to expire on 31 December 2013.

In 2013, the Hungarian authorities notified to the Commission a **Prolongation of the above-mentioned aid scheme** because the funds allocated for the scheme would not be completely utilised by the end of 2013.

5.2.5.2. Case study: suggestions

As far as the Hungarian aid scheme is concerned, the **Commission had accordingly decided not to raise any objections to the scheme that is compatible with the internal market under Article 93 TFEU**.

As highlighted previously, the above-mentioned Article introduces the concept of "**coordination of transport**" which goes beyond the simple fact of facilitating the development of an economic activity. It implies an intervention by public authorities, which is aimed at guiding the development of the transport sector in the common interest.

According to a constant decisional practice, aid for the coordination of transport is compatible with the Article 93 TFEU if the following conditions are met:

- The aid must contribute to a well-defined objective of common interest;
- The aid must be necessary and provide an incentive effect;
- The aid must be proportionate;
- Access to the aid must be open to all users on a non-discriminatory basis;
- The aid must not lead to distortions of competition contrary to the common interest.

Firstly, the aim of EU multimodal transport policy is to achieve a modal shift from road freight to other modes of transport. Furthermore, the White Paper on Transport Policy encourages the use of rail and other environmentally friendly modes of transport in order to become competitive alternatives to road haulage.

Secondly, for a given aid measure to be considered to "meet the needs" of transport coordination, it has to be necessary and proportionate to the intended objective. In the past[85], the Commission has authorised investment aid for intermodal transport up to an aid intensity of 50%.

Finally, the Commission further considers that the aid does not lead to distortions of competition to an extent contrary to the common interest. In this case, the aid should be granted to the construction of an infrastructure, which is accessible to all operators, providing benefits to both the enterprises already established in the impact area and those to be established at a later stage. The project also should contribute to the proportionate distribution of transport between road, railway and inland navigation, and thus it should contribute to favouring a modal shift, which reduces road transport.

[85] See decision of the Commission of 31.01.2001 in case N 597/2000, Netherlands – *Subsidieregeling voor bijzondere bedrijfsaansluitingen op vaarwegen*, decision of the Commission of 14.09.2001 in case N 208/2000, Netherlands – *SOIT*, decision of the Commission of 15.11.2000 in case N 755/1999, Italy – *Bolzano*, and decision of the Commission of 20.12.2000 in case N 490/2010, Belgium – *Verlenging van steunregeling N 550/2001 inzake publiek-private samenwerking voor de bouw van laad- en losinstallaties langs de waterwegen in het Vlaams Gewest*

6. Conclusions

Based on the analysis performed on collected data as well as on the contribution provided by stakeholders, the authors of the study **"Design features for support programmes for investments in last-mile infrastructure"** conclude that:

- There is a **need for investments** in last-mile infrastructure of about **9.7 billion EUR** for the period 2015-2030. 46% of this total investment need is allotted to Intermodal Terminals, due to high expected growth rates in this market segment. Private sidings and Rail logistic centers require 29% and 25% of the overall investment respectively.
- **Last-mile infrastructure** and rail freight production systems will undergo **further concentration**: large facilities will be used more extensively than today and provide higher volumes; in contrast, small and partially also middle sized facilities will be abandoned or served to a lesser extent. In consequence, the **total number of rail access points in Europe will decrease**, even under favourable framework conditions for rail freight.
- In order to cope with the forecasted volume growth of intermodal transport**, the capacity of the existing terminals shall be increased**.
- It is paramount to **drive investments with dedicated support programmes.** Dedicated instruments in Austria, Germany, and Switzerland achieved a success rate close to 100%. In these countries, **the investments in last-mile infrastructure** (new construction, extension/modernisation and reactivation of sidings) **are considered a great opportunity** to promote the growth of the railway freight transport and facilitate modal shift from road to rail.
- The scope of the programmes shall be properly defined according to preliminary identified and assessed priorities (e.g. corridor, states, regions, new last-mile link and/or renewals, infrastructure and/or ICT);
- **Dedicated programmes appear to be more suitable in achieving last-mile development than non-dedicated ones,** both in terms of effectiveness (e.g. transported rail freight volumes and capacity of the railway infrastructure) and efficiency (dedicated programmes enable a more rational use of financial resources, by concentrating them only on last-mile infrastructure projects and ensuring a greater impact).
- The adoption of **dedicated support instruments for investments in last-mile infrastructure** is in line with the objectives of the White Paper, prepared by EC. In particular, one of the main goals of the Paper is the **optimization of the performance of multimodal logistic chains**, which includes a greater use of inherently more resource-efficient modes.
- **It is necessary to diversify financial support instruments involving both public and private capital.** This would contribute to consolidate and develop the freight market/demand within the area of investment.
- **Better coordination between the Cohesion and Structural Funds with transport policy objectives** would reduce the risk of overlapping with the programmes at country level.
- **Member States need to ensure that sufficient national funding**, as well as sufficient project planning and implementation capacities, **is available in their budgetary planning**.
- **The reduction of administrative burden** (e.g. lighter norms, standards and operational rules to access to a siding and operate it) is necessary to unlock the potential for private finances being invested in last-mile infrastructure;
- **It is deemed important to list all last-mile infrastructure in the National Network Statements in a harmonised structure and understanding. This structure and understanding could be according to the four main categories of last-mile infrastructure as developed within this study: Private sidings, Public sidings, Rail logistic centres and Intermodal Terminals.** Indeed, this would be an important signal to the railway freight market – raising awareness on which facilities should be open to applicants under non-discriminatory conditions – to optimize their use and share costs.

- **An effectiveness-based reward mechanism should be set up**. The *differentiated track access charges*, for instance, is a performance-based instrument involving the infrastructure manager and the railway undertakings by which the railway undertakings receive a discount on the track access charge in case they reach specific levels of performance (e.g. train-kilometre). Another possible instrument is represented by *subsidies,* by which the Member State provides financial support to the owner of the siding that builds a railway link, or to the railway undertaking that transports freight along specific railway link. Finally, the *tax incentives* are available to operators applying desidered initiatives such as environmentally friendly solutions.

Taking into consideration the complexity of the rail freight market and the need for investments in the rail last-mile infrastructure, the following additional recommendations are presented, as elaborated on stakeholders' inputs. These recommendations specifically refer to the development of a comprehensive political and regulatory approach on the handling of the measures adopted to support investments:

- **providing guidelines** (similar to those on State Aid to railway undertakings), would facilitate the promotion of dedicated last-mile programmes. Similarly, the dissemination of best practices and success stories would be positively welcomed, e.g. during sectorial events (TEN-T days, EU Rail Freight Days, etc.);
- **verifying the conditions ensuring that dedicated programmes meet State Aid regulation's prescriptions** and provide guidance on how to obtain clearance at programme level (not at project level);
- **considering earmarking of specific funds** under CEF and Cohesion Funds to co-fund Regional and Country dedicated last-mile programmes, to be chosen following a competitive approach (call) aimed to select the most promising proposals, which would result in higher benefits;
- **supporting and monitoring the development of last-mile infrastructure along Core Network Corridors/RFCs,** coherently with the existing regulatory framework (e.g. Core Network Corridor, RFC management bodies and committees).

Annex A1 – Key Countries (data analysis)

Railway Index

The Railway Index was calculated taking into account the following items:

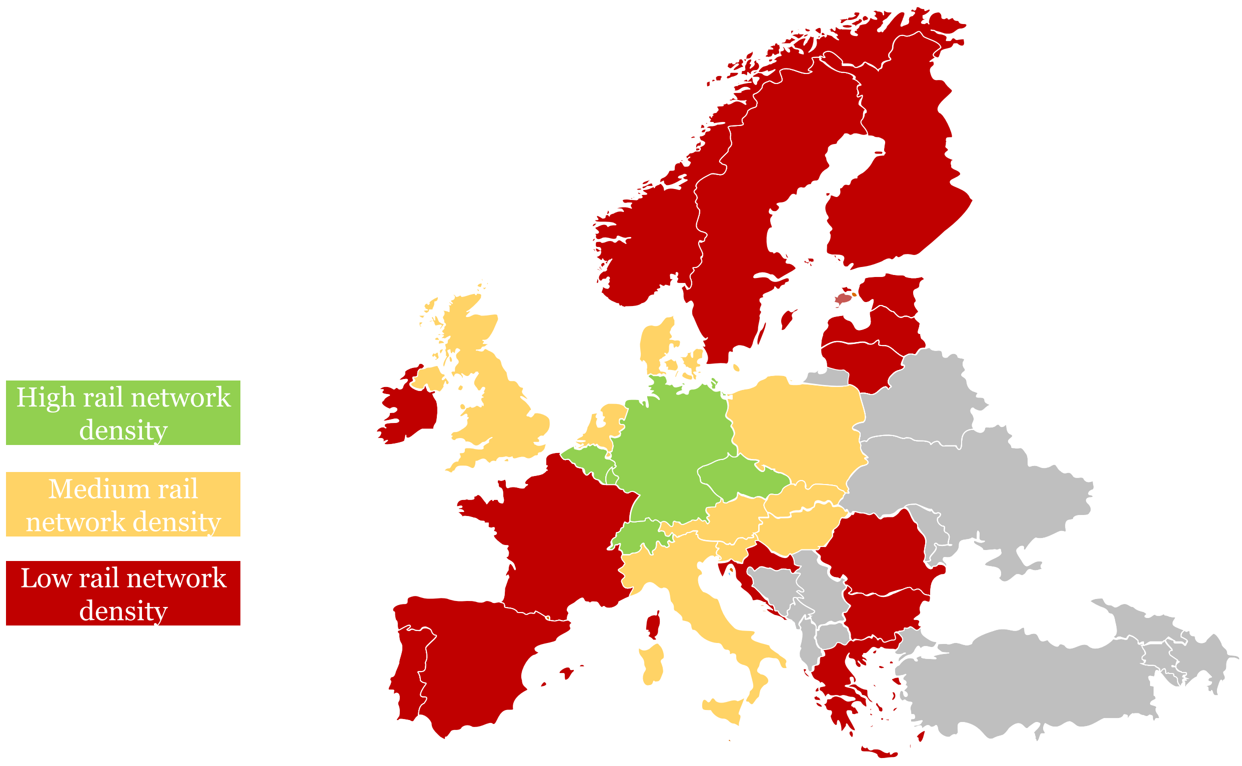
- **Railway network density [m/km²]**;
- **Number of TEN – T Corridors**.

Railway network density

To assess the Railway network density, countries were divided into three sub-clusters as follows:

- Low rail network density = < 50 m/km²;
- Medium rail network density = 50 ÷ 100 m/km²;
- High rail network density = > 100 m/km².

Figure 69 - Railway network density [m/km²]



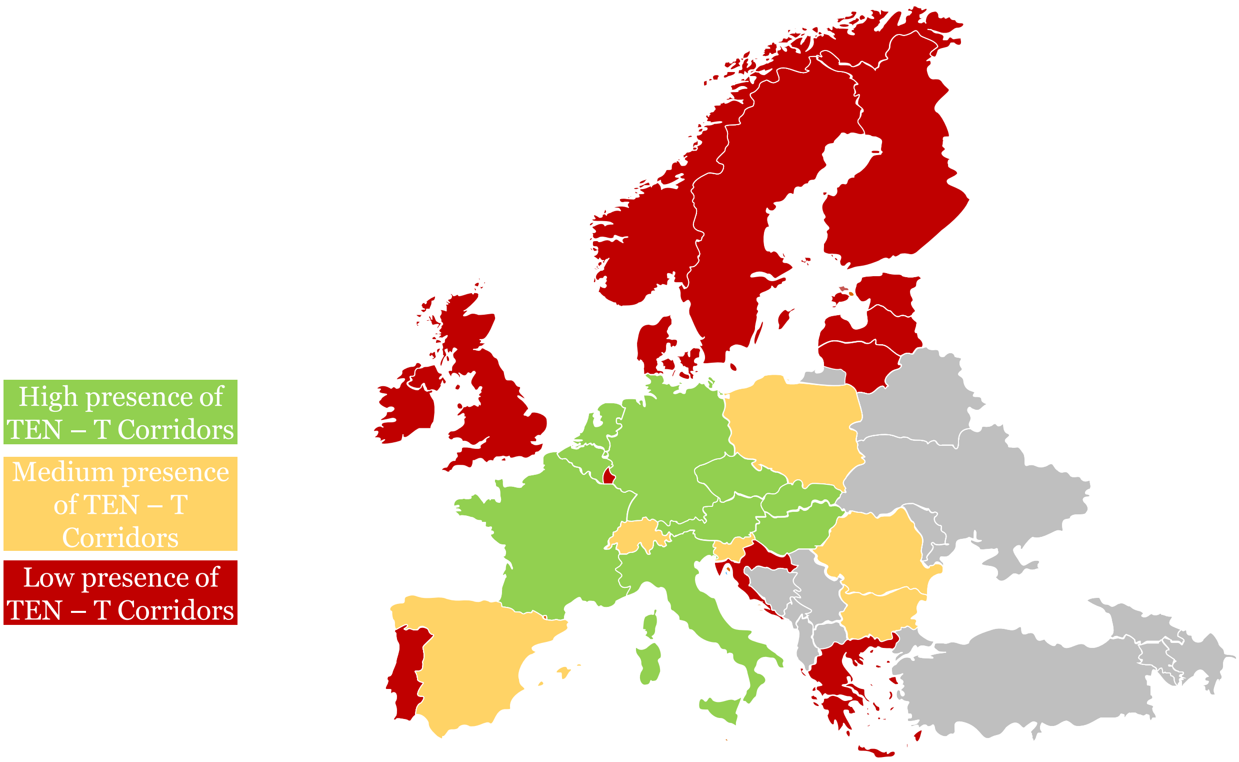
As showed in Figure 69, the highest railway network density was registered in Belgium, Czech Republic, Germany, Luxembourg and Switzerland. A medium density was recorded in Austria, Denmark, Hungary, Italy, Poland, Slovakia, Slovenia, the Netherlands and the United Kingdom, while a low density in Bulgaria, Croatia, Estonia, Finland, France, Greece, Latvia, Lithuania, Norway, Portugal, Republic of Ireland, Romania, Spain, and Sweden.

Number of TEN – T Corridors

To assess the presence of TEN-T Corridors, the following sub-clusters were defined:

- Low presence of TEN – T Corridors = 1;
- Medium presence of TEN – T Corridors = 2;
- High presence of TEN – T Corridors = > 3.

Figure 70 - Presence of TEN - T Corridors in each Country



The highest presence of TEN – T Corridors was detected in Austria, Belgium, Czech Republic, France, Germany, Hungary, Italy, Slovakia, and the Netherlands (see Figure 70). A medium presence was registered in Bulgaria, Poland Romania, Slovenia, Spain and Switzerland and a low one in Croatia, Denmark, Estonia, Finland, Greece, Latvia, Lithuania, Norway, Portugal, Republic of Ireland, Sweden and the United Kingdom.

Industry density Index

The Industry density Index was calculated taking into consideration the following criteria:

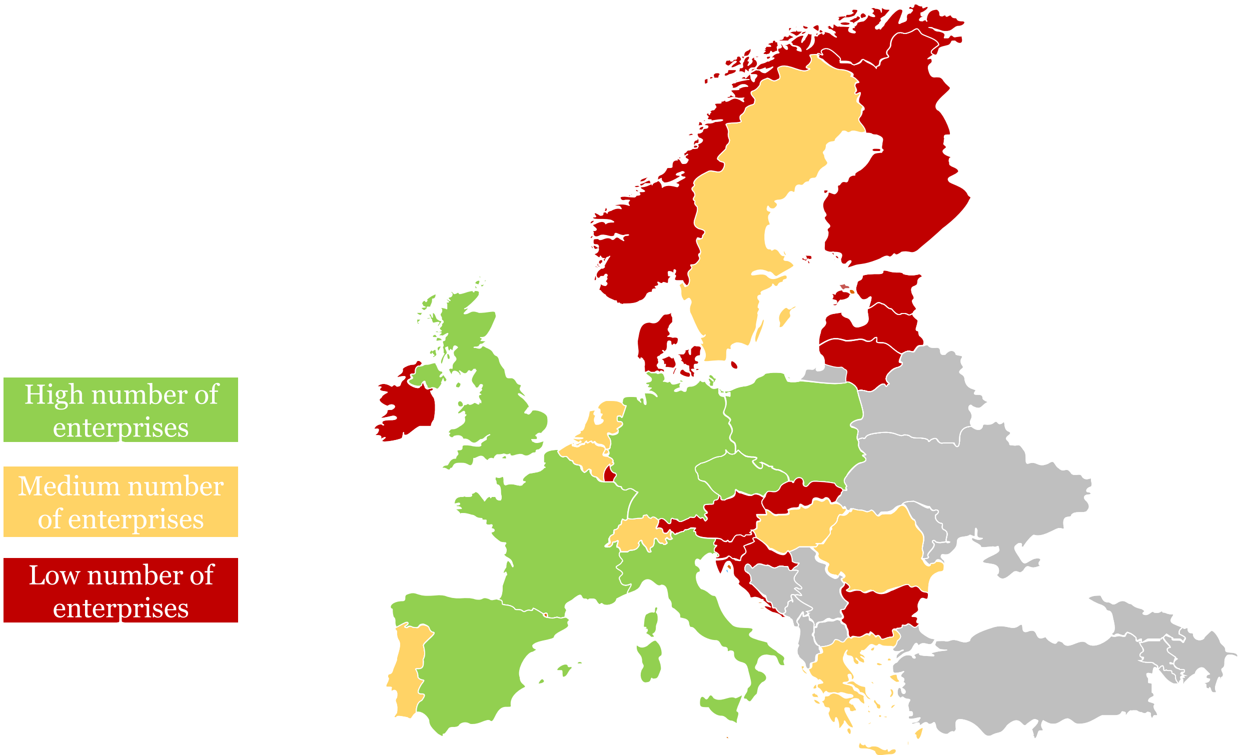
- **Number of enterprises (SMEs + Large)**;
- **Goods transport by rail [t]**.

Number of enterprises

As for the number of enterprises, the following sub-clusters were selected:

- Low number of enterprises = 1.000 ÷ 400.000;
- Medium number of enterprises = 400.000 ÷ 1.000.000;
- High number of enterprises = > 1.000.000

Figure 71 - Number of active European enterprises (source: SME Performance review, European Commission, 2013)



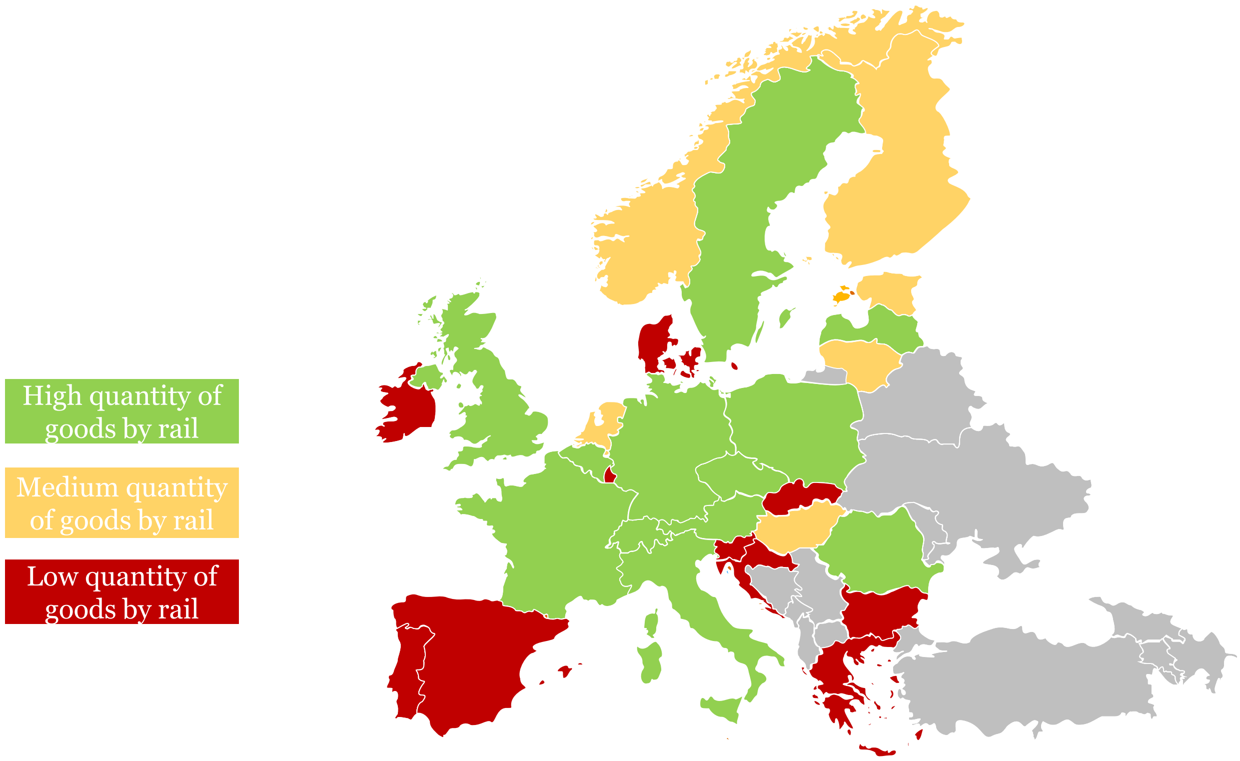
As illustrated in Figure 71 above, the highest number of active enterprises was recorded in Czech Republic, France, Germany, Italy, Poland, Spain and United Kingdom. A medium value was recorded in Belgium, Greece, Hungary, Portugal, Romania, Sweden, Switzerland and the Netherlands, while a low one in Austria, Bulgaria, Croatia, Denmark, Estonia, Finland, Latvia, Lithuania, Luxembourg, Norway, Republic of Ireland, Slovakia and Slovenia.

Goods transport by rail

As far as goods transport by rail is concerned, the following three sub-clusters were identified:

- Low quantity of goods by rail [t] = 40.000 ÷ 25.000.000;
- Medium quantity of goods by rail [t] = 25.000.000 ÷ 50.000.000;
- High quantity of goods by rail [t] = > 50.000.000.

Figure 72 - Goods transport by rail [t] (source: EUROSTAT, 2013)



The highest values of goods transport by rail were registered in Austria, Belgium, Czech Republic, France, Germany, Italy, Latvia, Poland, Romania, Sweden, Switzerland, and the United Kingdom (see Figure 72). Medium values were recorded in Estonia, Finland, Hungary, Lithuania, Norway, and the Netherlands, whereas low ones in Bulgaria, Croatia, Denmark, Greece, Luxembourg, Portugal, Republic of Ireland, Slovakia, Slovenia, and Spain.

Sidings Number Index

The index basing on the number of sidings was defined considering the following criteria:

- **Number of intermodal terminals**;
- **Number of private sidings**;
- **Number of stations with public sidings**;
- **Access points per 1.000 km**.

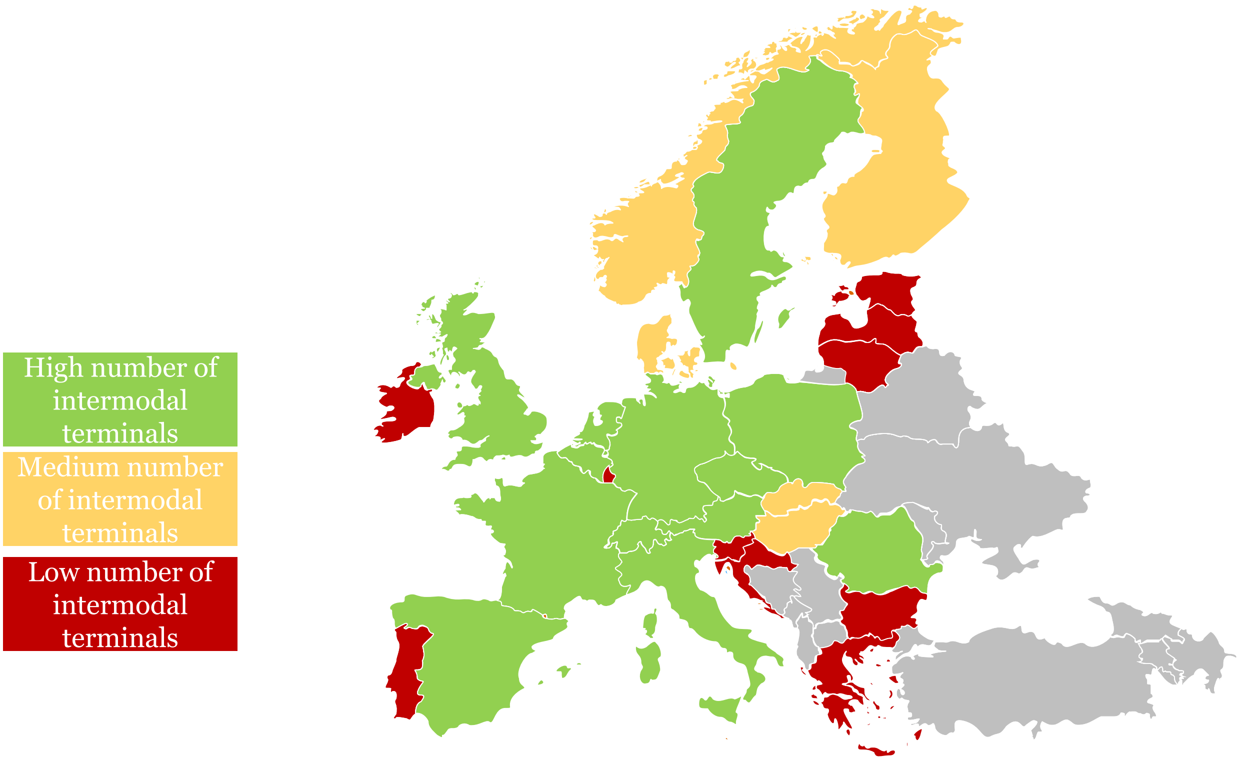
Number of intermodal terminals

The first item was broken down into three sub-clusters as follows:

- Low number of intermodal terminals = < 10;
- Medium number of intermodal terminals = 10 < n < 20;
- High number of intermodal terminals = > 20.

Figure 73 shows the results of the clustering procedure:

Figure 73 - Number of intermodal terminals



As shown in Figure 73, the highest number of intermodal terminals at country level was registered in Austria, Belgium, Czech Republic, France, Germany, Italy, Poland, Romania, Spain, Sweden, Switzerland, the Netherlands, and the United Kingdom. A medium number of intermodal terminals was identified in Denmark, Finland, Hungary, Norway, and Slovakia while a low one in Bulgaria, Croatia, Estonia, Greece, Latvia, Lithuania, Luxembourg, Portugal, Republic of Ireland, and Slovenia.

Number of private sidings

The second item was divided into the following sub-clusters:

- Low number of private sidings = < 200;
- Medium number of private sidings = 200 < n < 500;
- High number of private sidings = > 500

Figure 74 - Number of private sidings

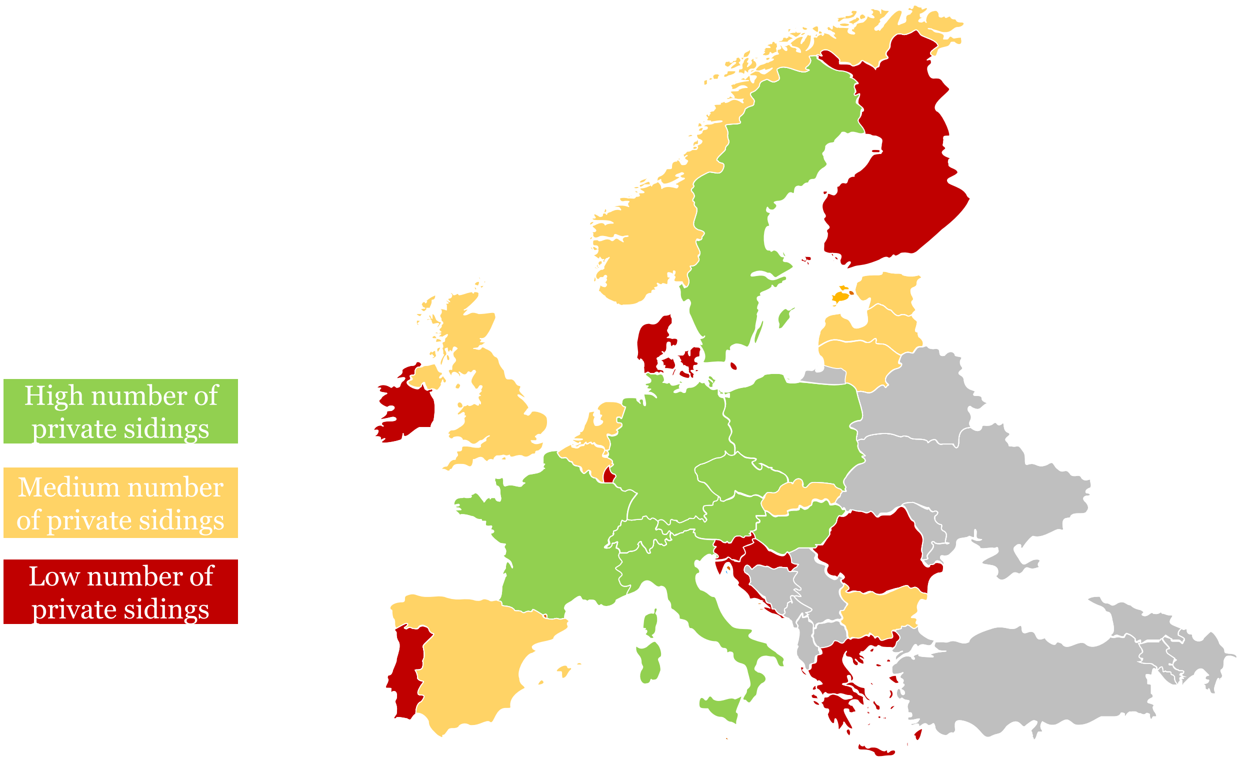


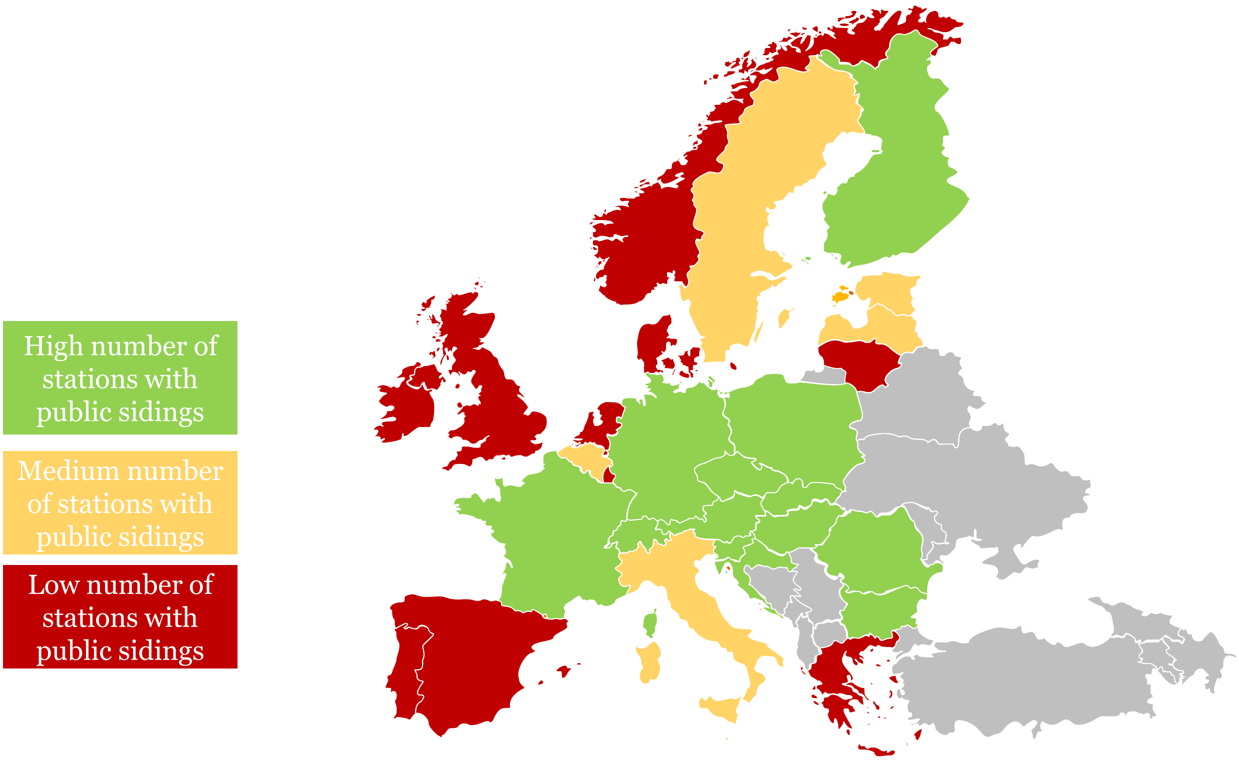
Figure 74 shows that the highest number of private sidings was recorded in Austria, Czech Republic, France, Germany, Hungary, Italy, Poland, Sweden, and Switzerland. A medium number of private sidings was recorded in Belgium, Bulgaria, Estonia, Latvia, Lithuania, Norway, Slovakia, Spain, the Netherlands, and the United Kingdom, while a low one in Croatia, Denmark, Finland, Greece, Luxembourg, Portugal, Republic of Ireland, Romania, and Slovenia.

Number of stations with public sidings

The third item was broken down into the following sub-clusters:

- Low number of stations with public sidings = < 100;
- Medium number of stations with public sidings = 100 < n < 200;
- High number of stations with public sidings = > 200

Figure 75 - Number of stations with public sidings



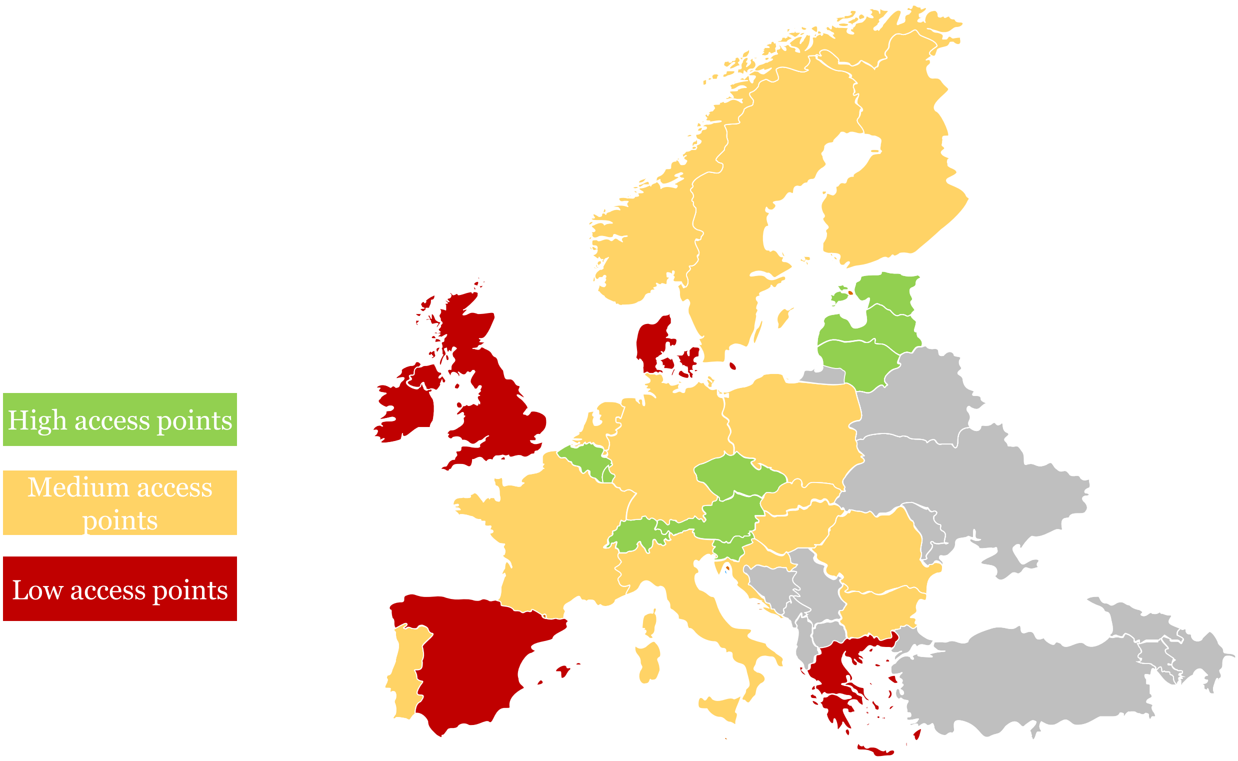
As showed in Figure 75 above, the highest number of stations with public sidings was recorded in Austria, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Hungary, Poland, Romania, Slovakia, Slovenia, and Switzerland. A medium number was recorded in Belgium, Estonia, Italy, Latvia, and Sweden, while a low number in Denmark, Greece, Lithuania, Luxembourg, Norway, Portugal, Republic of Ireland, Spain, The Netherlands, and United Kingdom.

Access points per 1.000 km

Finally, the fourth item was classified as follows:

- Low access points per 1.000 km = < 50;
- Medium access points per 1.000 km = 50 < n < 150;
- High access points per 1.000 km = > 150.

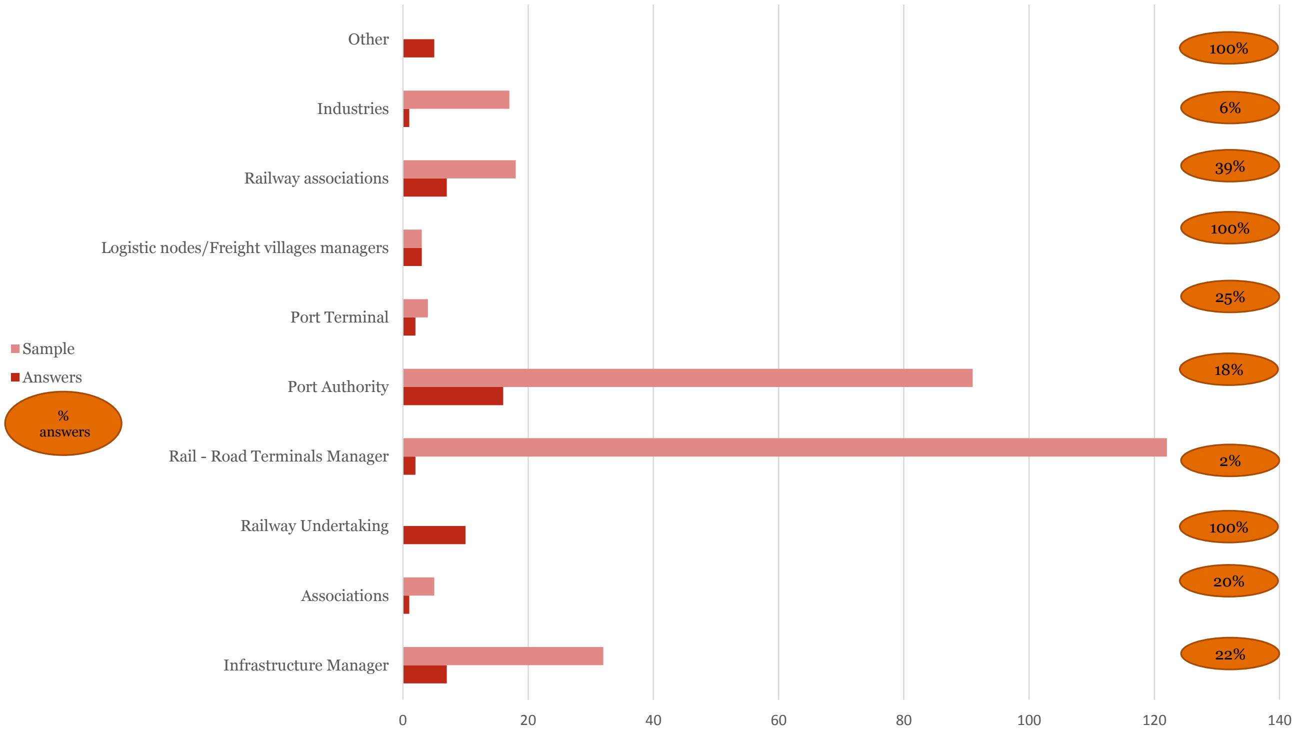
Figure 76 - Number of Access points per 1.000 km



As showed in Figure 76 above, the highest value of access points was registered in Austria, Belgium, Czech Republic, Estonia, Latvia, Lithuania, Luxembourg, Slovenia, and Switzerland. A medium value of access points was recorded in Bulgaria, Croatia, Finland, France, Germany, Hungary, Italy, Norway, Poland, Portugal, Romania, Slovakia, Sweden, and The Netherlands. Finally, a low value was registered in Denmark, Greece, Republic of Ireland, Spain, and the United Kingdom.

Annex A2 – Focus on the first phase of stakeholder consultation

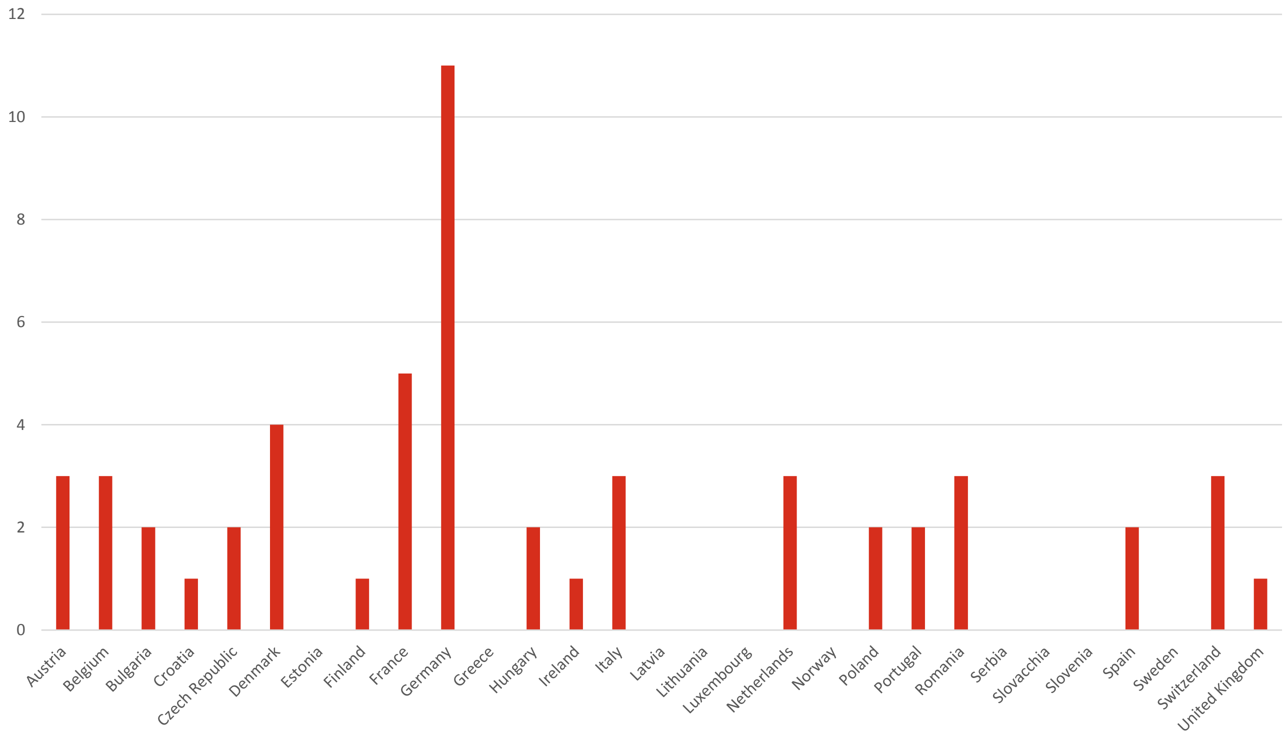
Figure 77 – Split of received questionnaires by group of stakeholder



As far as the survey statistics is concerned, Figure 75 summarises the number of stakeholders contacted within each cluster group (Sample) during the first phase of the consultation, the number of responses provided by each of them (Answers) and the "degree of responsiveness" calculated as a percentage of the latter on the former (% answers). In absolute terms, the **Port Authorities'** and **Railway Undertakings'** clusters have provided the highest number of answers, ranking first and second respectively. In the third place **Railway Associations,** closely followed by the **Infrastructure Managers** cluster.

As for as the geographical area where the organisations operate, **Germany** and **France** proved to be the most frequently cited countries. More details are reported in Figure 76 below:

Figure 78 – Geographical coverage of the questionnaire answers



The following table provides the number of questionnaires sent and received broken down by some of the most relevant stakeholder clusters:

Table 60 – Total sent and received questionnaires broken down by specific clusters

No. of questionnaires	Associations	Industries	Logistic Nodes/Freight villages	Railway Associations
Sent	5	17	3	18
Received	1	1	3	7
Response rate	**20%**	**6%**	**100%**	**39%**

Finally, Table 54 below shows the questionnaires sent and received broken down by country and stakeholder cluster:

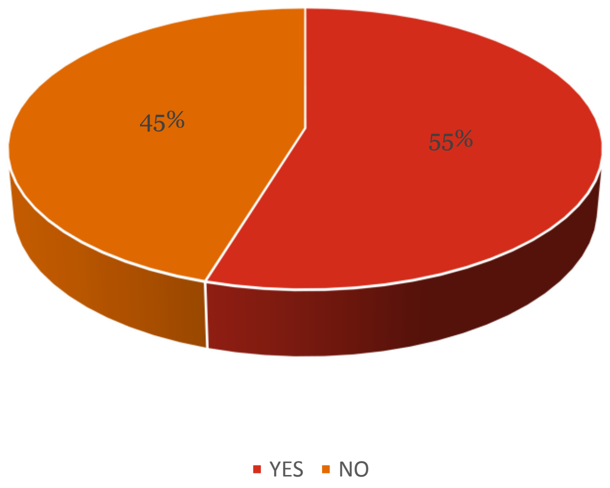
Table 61 – Questionnaires sent and received for the Infrastructure manager, Port Authority, Port Terminal and Rail - Road Terminal managers clusters

Country	Infrastructure Managers	Port Authority		Port Terminal		Rail – Road Terminal managers	
	Received	Sent	Received	Sent	Received	Sent	Received
Austria	-	-	-	-	-	8	-
Belgium	-	6	2	-	-	9	-
Bulgaria	-	-	-	1	1	3	-
Croatia	✓	1	-	-	-	5	-
Czech Republic	-	-	-	-	-	8	-

Country	Infrastructure Managers	Port Authority		Port Terminal		Rail – Road Terminal managers	
	Received	Sent	Received	Sent	Received	Sent	Received
Denmark	✓	9	3	-	-	2	-
Estonia	-	-	-	-	-	-	-
Finland	-	2	1	-	-	-	-
France	✓	9	-	-	-	4	-
Germany	-	9	3	3	-	14	-
Greece	-	3	-	-	-	-	-
Hungary	✓	-	-	-	-	3	1
Italy	-	4	2	-	-	6	-
Latvia	-	-	-	-	-	2	-
Lithuania	-	2	-	-	-	3	-
Luxembourg	-	-	-	-	-	2	-
Norway	-	1	-	-	-	-	-
Poland	✓	3	-	-	-	10	-
Portugal	✓	3	1	-	-	-	-
Republic of Ireland	-	5	1	-	-	-	-
Romania	✓	2	1	-	-	5	-
Slovakia	-	-	-	-	-	7	-
Slovenia	-	-	-	-	-	4	-
Spain	-	9	1	-	-	5	1
Sweden	-	5	-	-	-	7	-
Switzerland	-	-	-	-	-	6	-
The Netherlands	-	6	2	-	-	9	-
United Kingdom	-	12	-	-	-	-	-
TOTAL	**7**	**91**	**17**	**4**	**1**	**122**	**2**

As shown in Figure 77 below, **55% of respondents declared to be aware of supporting programmes** for financing investments in last-mile infrastructure for rail.

Figure 79 - Percentage of respondents aware of supporting programmes to finance investments in last-mile infrastructure



The following figures present the percentage of respondents that declared to be aware of last-mile support programmes broken down by country and stakeholder cluster:

Figure 80 - Percentage of awareness - Other cluster

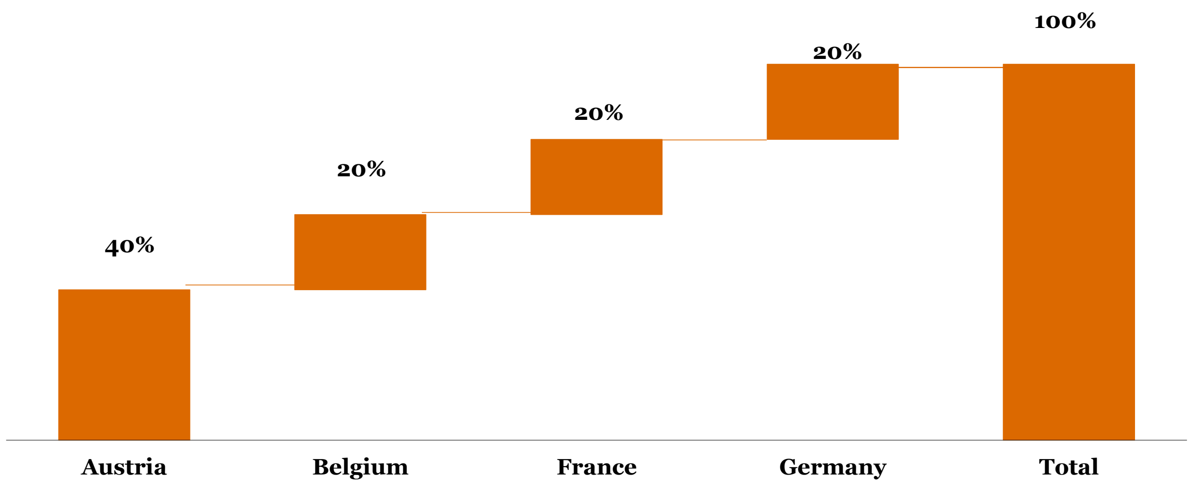


Figure 81 - Percentage of awareness - Logistic Nodes cluster

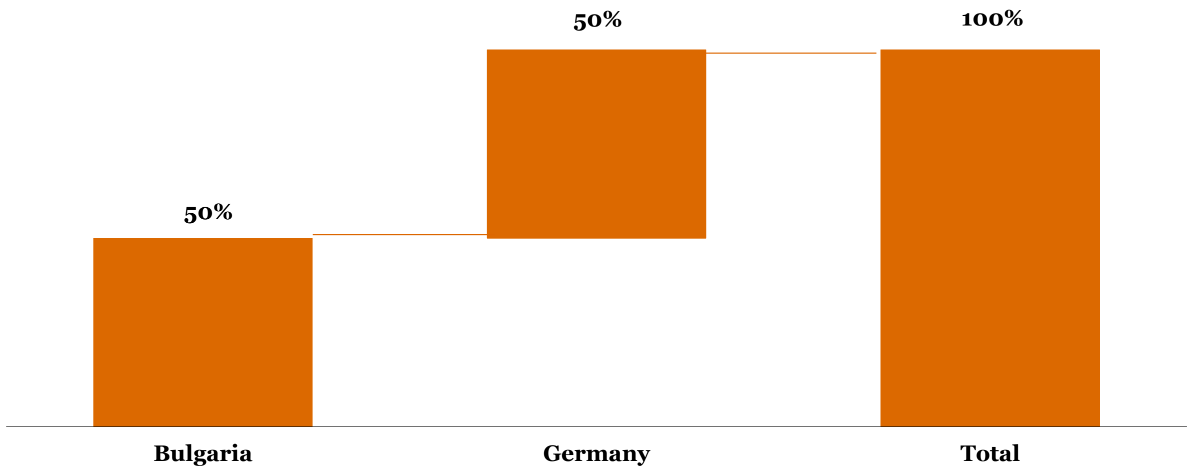


Figure 82 - Percentage of awareness - Infrastructure Manager cluster

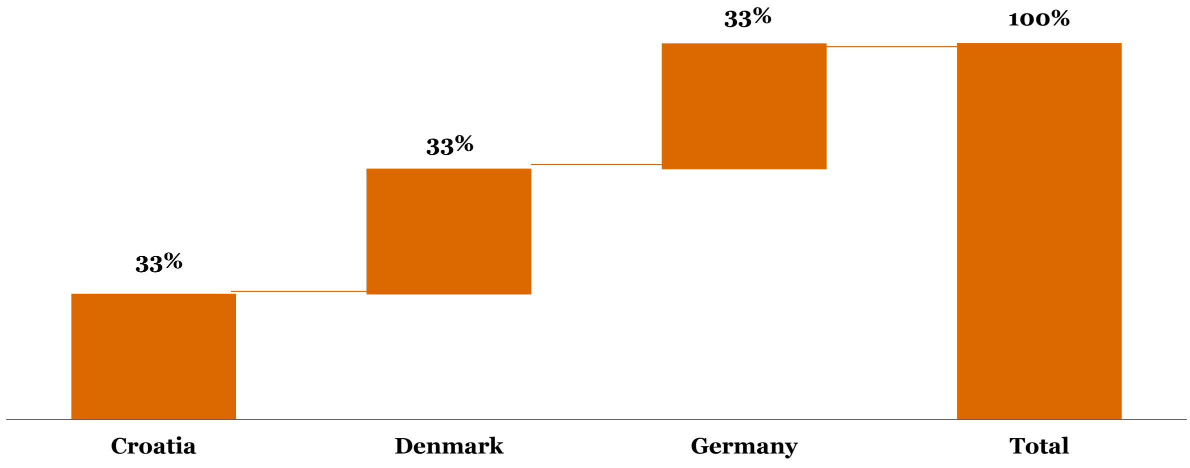


Figure 83 - Percentage of awareness - Railway undertaking cluster

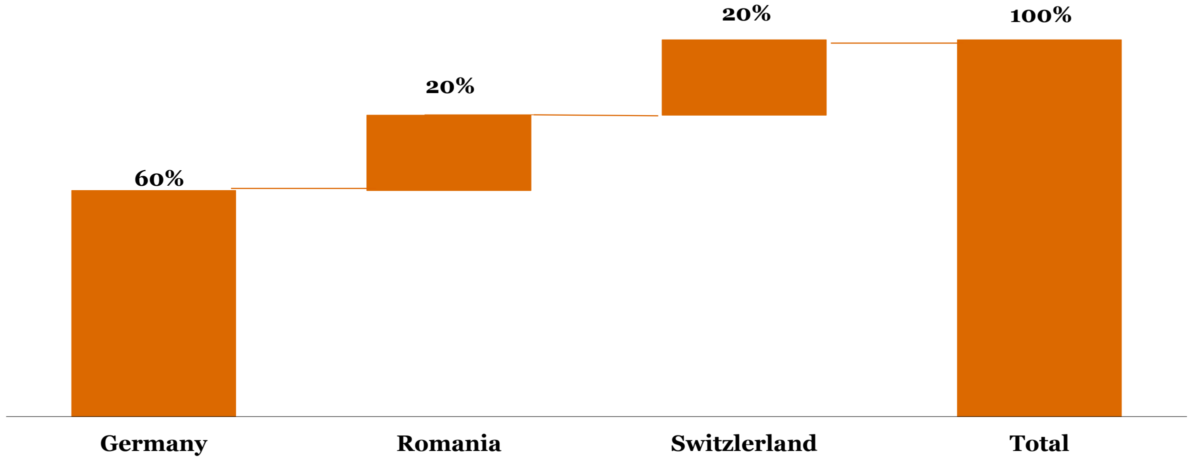


Figure 84 - Percentage of awareness - Port Authority cluster

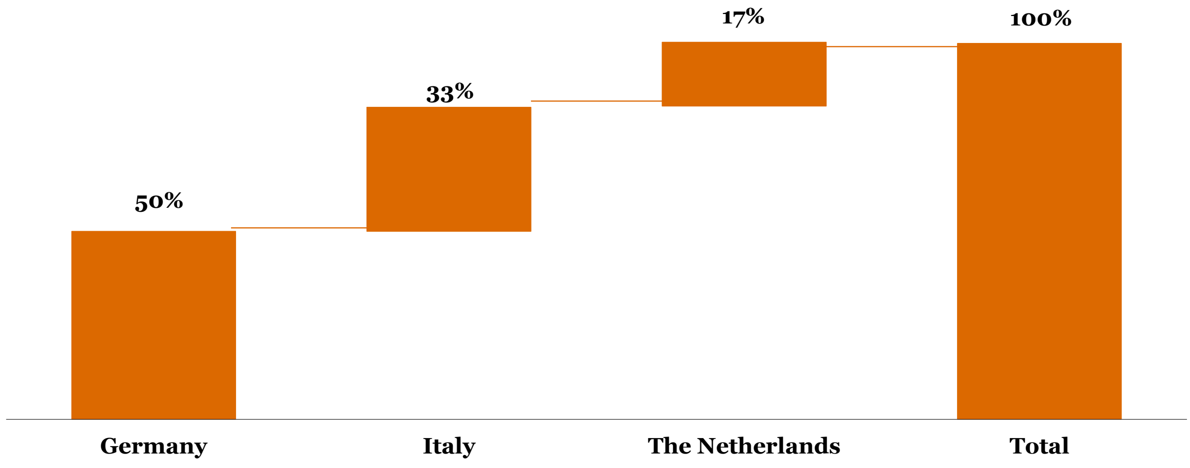
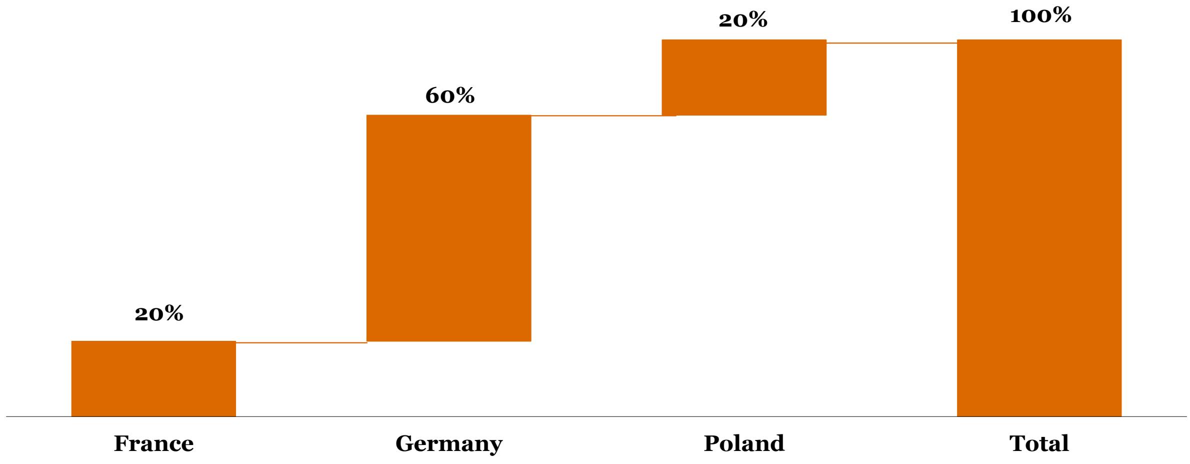


Figure 85 - Percentage of awareness - Railway Association cluster



Annex B – Questionnaire (Phase 1)

The following represents the questionnaire template for Tasks 1 and 2 the Stakeholders have been asked to fill.

Introduction

L1 Design features for support programmes for investment in last-mile infrastructure

Stakeholder Consultation - Phase 1

Overview of existing programmes for investment in last-mile infrastructure, assessment of existing and past programmes and additional support measures

L2 Preface

In the last few years, the focus of EU and Member States action has been mainly on the completion of rail freight and TEN-T corridors. Nevertheless, it is essential to also consider the access points to these corridors. Indeed, last-mile infrastructure is a crucial element of the rail system (providing an entry point to the corridors). Various studies have highlighted the importance of developing last-mile infrastructure to enhance wagonload traffic and rail freight in general. However, many sidings were built more than 50 years ago and are in great need of upgrades. The lack of adequate funding can lead to their abandonment or disappearance, which in turn could force certain categories of shippers to stop considering rail as a viable logistic option, being no longer linked to the rail network. Funding schemes for investment in last-mile infrastructure exist but mainly at national level and their number is limited. Some funding is also available under CEF and the cohesion funds, which are however not dedicated instruments.

L3 Objectives of the questionnaire

Therefore, the present questionnaire has two main objectives: to identify, describe and analyse the existing dedicated support–programmes/instruments in Europe for financing and developing last-mile infrastructure; to identify, describe and analyse other programmes/instruments at EU and national level for financing and developing last-mile infrastructure.

L4 Your contribution

Within this context your contribution is of the utmost importance, as the information you will provide us will determine the successful completion of the current study, ensuring great benefits for the European Commission, the wide range of stakeholders involved and the sector as a whole.

L5

Privacy and Confidentiality Please note that answers to this survey will be reported in an aggregated format only and all data about your organisation will not be disclosed without your consent.

L6 Support

Should you require any support with the completion of the survey please contact us at: pwc-stakeholderconsultation@it.pwc.com

Definitions

L7 Definitions

In the context of this study, last-mile infrastructure shall be understood as: track infrastructure at industries and storages and in terminals for trans-shipment of goods or intermodal loading units between rail and other transport modes; local sidings leading from and to these sites (sidings which are not used by other traffic than that from and to these sites), including, where applicable, signalling equipment, equipment for electric overhead wire, equipment for protection of level crossings; switches connecting these sidings to the "main-line" network and related signalling equipment and equipment for electric overhead wire; related infrastructure for the loading and unloading of freight wagons at above-mentioned sites, such as loading ramps, paved surfaces, power supply equipment, surveillance, fences and gates, etc.; minor local yards for train formation in the vicinity of above-mentioned sites, if their primary purpose is to enable the collection and delivery of wagons/trains to such sites.

Stakeholder information

L8 Please indicate the geographical area(s) where your organisation operates (multiple choices can be selected):

- ❑ Austria (1)
- ❑ Belgium (2)
- ❑ Bulgaria (3)
- ❑ Croatia (4)
- ❑ Cyprus (5)
- ❑ Czech Republic (6)
- ❑ Denmark (7)
- ❑ Estonia (8)
- ❑ Finland (9)
- ❑ France (10)
- ❑ Germany (11)
- ❑ Greece (12)
- ❑ Hungary (13)
- ❑ Ireland (14)
- ❑ Italy (15)
- ❑ Latvia (16)
- ❑ Lithuania (17)
- ❑ Luxembourg (18)
- ❑ Malta (19)
- ❑ Netherlands (20)
- ❑ Poland (21)
- ❑ Portugal (22)
- ❑ Romania (23)
- ❑ Slovakia (24)
- ❑ Slovenia (25)
- ❑ Spain (26)
- ❑ Sweden (27)
- ❑ United Kingdom (28)
- ❑ Other Europe (29) ____________________
- ❑ North America (30) ____________________
- ❑ Latin America (31) ____________________
- ❑ Middle East & Africa (32) ____________________
- ❑ Asia Pacific (33) ____________________

L9 Please select the sector(s) in which your organisation is active (multiple choices can be selected):

- ❑ Rail (1)
- ❑ Road (2)
- ❑ Maritime (3)
- ❑ Inland waterways (8)
- ❑ Logistic sector (5)
- ❑ Intermodal transport (please specify) (6) ________________________
- ❑ Other (please specify) (4) ________________________

L 10 Indicate the category(ies) your organisation belongs to (multiple choices can be selected). Please note: if your company falls under multiple categories, only tick the boxes that correspond to the perspective you are providing when responding (eg. Rail Infrastructure Managers; if you are responding on behalf the infrastructure manager division).

- ❑ Member States (12)
- ❑ Rail Infrastructure Managers (1)
- ❑ Railway Undertakings (RUs) (2)
- ❑ Freight forwarders / Shippers / Multimodal transport operators (3)
- ❑ Rail road terminal managers (4)
- ❑ Port Authorities (5)
- ❑ Port Terminal Managers (6)
- ❑ Logistic nodes / Freight villages managers (7)
- ❑ Railway associations (please specify) (8) ________________________
- ❑ Logistic Associations (please specify) (9) ________________________
- ❑ Industry (please specify) (10) ________________________
- ❑ Other (please specify) (11) ________________________

If "Member States" or "Rail Infrastructure Managers" is selected, the following question (L11) will be shown:

L11 Please indicate the number (e.g. 25) or range (e.g. 20-30) of last-mile infrastructure in your country and the respective reference year:

	Private Sidings (1)	Public accessible sidings in rail stations (2)	Railports/ rail logistic centres (3)	Intermodal terminals (4)
Number/Range (2) Year (1)				

L12 Overview of existing programmes for investment in last-mile infrastructure

L13 Are you aware of supporting programmes/instruments that could be used to finance investments in last-mile infrastructure for rail?

- ❍ Yes (1)
- ❍ No (2)

If "No" is selected the following question (L14) will be shown. If "Yes" is indicated question L15 will appear.

L14 Are you aware of any other initiatives (e.g. tax incentives, discount schemes, etc.) or similar national or regional policies that support the same objective as funding schemes for last-mile infrastructure without providing direct funding? If yes please comment:

If question L14 appears, the questionnaire will then skip to question L65.

L15 Please provide us with information about the programme(s)/instrument(s) you are aware of (note that one page per programme/instrument will be displayed, for a maximum of three if applicable).

L16 Name of the programme/instrument:

L17 Geographical coverage:

- ❍ EU (1)
- ❍ National (2)
- ❍ Regional (3)
- ❍ Other (4) ____________________

L18 If the programme/instrument has a national or regional coverage please specify the country concerned:

- ❍ EU (1)
- ❍ Austria (2)
- ❍ Belgium (3)
- ❍ Bulgaria (4)
- ❍ Croatia (5)
- ❍ Cyprus (6)
- ❍ Czech Republic (7)
- ❍ Denmark (8)
- ❍ Estonia (9)
- ❍ Finland (10)
- ❍ France (11)
- ❍ Germany (12)
- ❍ Greece (13)
- ❍ Hungary (14)
- ❍ Ireland (15)
- ❍ Italy (16)
- ❍ Latvia (17)
- ❍ Lithuania (18)
- ❍ Luxembourg (19)
- ❍ Malta (20)
- ❍ Netherlands (21)

- ❍ Poland (22)
- ❍ Portugal (23)
- ❍ Romania (24)
- ❍ Slovakia (25)
- ❍ Slovenia (26)
- ❍ Spain (27)
- ❍ Sweden (28)
- ❍ United Kingdom (29)

L19 Please indicate the entity in charge and specify the contact point if known:

- ❍ Government department/Ministry (1)
- ❍ Regional authority/agency (2)
- ❍ Other (please specify) (3) ____________________

L20 Contact point:

L21 Is the instrument/programme specifically dedicated to funding last-mile infrastructure?

- ❍ Yes (1)
- ❍ No (2)

L22 If yes, in which way was the programme relevant to last-mile infrastructure?

- ❍ Through direct financial contribution to the rehabilitation or building of last mile infrastructure (1)
- ❍ Through other means (please specify) (2) ____________________

L23 Which type of investment is covered?

- ❍ Tracks only (1)
- ❍ Tracks, signalling, switches, etc. (2)
- ❍ Other (please specify) (3) ____________________

L24 Which type of support is provided?

- ❍ Grant (1)
- ❍ Loan (2)
- ❍ Other (please specify) (3) ____________________

L25 Eligible actions covered by the programme/instruments (multiple choices can be selected):

- ❑ Building of new tracks/facilities (1)
- ❑ Rehabilitation or upgrade of tracks/facilites (2)
- ❑ Studies (3)
- ❑ Other (please specify) (4) ____________________

L26 Does the scheme come with additional obligations, conditions or specific support measures (e.g. relation with territorial planning, tax credits, etc.)? If yes please explain:

L27 In your opinion can the programme be improved? If yes, please explain how:

L28 Can you indicate some reference concerning the programme/instrument (e.g. weblink)?

L29 In addition, can you provide us with an informative document related to the programme? (please upload the file if applicable)

L30 Any other relevant aspects you would like to mention? Please comment below:

L31 Are you aware of any other programme/instrument for which you want to provide information?

- ❍ Yes (1)
- ❍ No (2)

If "No" is selected the questionnaire will skip to question L65. If "Yes" is selected it will continue as follows:

L32 Name of the programme/instrument:

L33 Geographical coverage:

- ❍ EU (1)
- ❍ National (2)
- ❍ Regional (3)
- ❍ Other (4) ______________________

L34 If the programme/instrument has a national or regional coverage please specify the country concerned:

- ❍ EU (1)
- ❍ Austria (2)
- ❍ Belgium (3)
- ❍ Bulgaria (4)
- ❍ Croatia (5)
- ❍ Cyprus (6)
- ❍ Czech Republic (7)
- ❍ Denmark (8)
- ❍ Estonia (9)
- ❍ Finland (10)
- ❍ France (11)
- ❍ Germany (12)
- ❍ Greece (13)
- ❍ Hungary (14)
- ❍ Ireland (15)
- ❍ Italy (16)
- ❍ Latvia (17)
- ❍ Lithuania (18)
- ❍ Luxembourg (19)
- ❍ Malta (20)
- ❍ Netherlands (21)
- ❍ Poland (22)
- ❍ Portugal (23)
- ❍ Romania (24)
- ❍ Slovakia (25)
- ❍ Slovenia (26)
- ❍ Spain (27)
- ❍ Sweden (28)
- ❍ United Kingdom (29)

L35 Please indicate the entity in charge and specify the contact point if known:

- ❍ Government department/Ministry (1)
- ❍ Regional authority/agency (2)
- ❍ Other (please specify) (3) ______________________

L36 Contact point:

L37 Is the instrument/programme specifically dedicated to funding last-mile infrastructure?

- ❍ Yes (1)
- ❍ No (2)

L38 If yes, in which way was the programme relevant to last-mile infrastructure?

- ❍ Through direct financial contribution to the rehabilitation or building of last mile infrastructure (1)
- ❍ Through other means (please specify) (2) ____________________

L39 Which type of investment is covered?

- ❍ Tracks only (1)
- ❍ Tracks, signalling, switches, etc. (2)
- ❍ Other (please specify) (3) ____________________

L40 Which type of support is provided?

- ❍ Grant (1)
- ❍ Loan (2)
- ❍ Other (please specify) (3) ____________________

L41 Eligible actions covered by the programme/instruments (multiple choices can be selected):

- ❑ Building of new tracks/facilities (1)
- ❑ Rehabilitation or upgrade of tracks/facilites (2)
- ❑ Studies (3)
- ❑ Other (please specify) (4) ____________________

L42 Does the scheme come with additional obligations, conditions or specific support measures (e.g. relation with territorial planning, tax credits, etc.)? If yes please explain:

L43 In your opinion can the programme be improved? If yes, please explain how:

L44 Can you indicate some reference concerning the programme/instrument (e.g. weblink)?

L45 In addition, can you provide us with an informative document related to the programme? (please upload the file if applicable)

L46 Any other relevant aspects you would like to mention? Please comment below:

L47 Are you aware of any other programme/instrument for which you want to provide information?

- ❍ Yes (1)
- ❍ No (2)

If "No" is selected, the questionnaire will skip to question L63. If "Yes" is selected it will continue as follows:

L48 Name of the programme/instrument:

L49 Geographical coverage:

- EU (1)
- National (2)
- Regional (3)
- Other (4) ________________________

L50 If the programme/instrument has a national or regional coverage please specify the country concerned:

- EU (1)
- Austria (2)
- Belgium (3)
- Bulgaria (4)
- Croatia (5)
- Cyprus (6)
- Czech Republic (7)
- Denmark (8)
- Estonia (9)
- Finland (10)
- France (11)
- Germany (12)
- Greece (13)
- Hungary (14)
- Ireland (15)
- Italy (16)
- Latvia (17)
- Lithuania (18)
- Luxembourg (19)
- Malta (20)
- Netherlands (21)
- Poland (22)
- Portugal (23)
- Romania (24)
- Slovakia (25)
- Slovenia (26)
- Spain (27)
- Sweden (28)
- United Kingdom (29)

L51 Please indicate the entity in charge and specify the contact point if known:

- Government department/Ministry (1)
- Regional authority/agency (2)
- Other (please specify) (3) ________________________

L52 Contact point:

L53 Is the instrument/programme specifically dedicated to funding last-mile infrastructure?

- Yes (1)
- No (2)

L54 If yes, in which way was the programme relevant to last-mile infrastructure?

- ❍ Through direct financial contribution to the rehabilitation or building of last mile infrastructure (1)
- ❍ Through other means (please specify) (2) ____________________

L55 Which type of investment is covered?

- ❍ Tracks only (1)
- ❍ Tracks, signalling, switches, etc. (2)
- ❍ Other (please specify) (3) ____________________

L56 Which type of support is provided?

- ❍ Grant (1)
- ❍ Loan (2)
- ❍ Other (please specify) (3) ____________________

L57 Eligible actions covered by the programme/instruments (multiple choices can be selected):

- ❑ Building of new tracks/facilities (1)
- ❑ Rehabilitation or upgrade of tracks/facilites (2)
- ❑ Studies (3)
- ❑ Other (please specify) (4) ____________________

L58 Does the scheme come with additional obligations, conditions or specific support measures (e.g. relation with territorial planning, tax credits, etc.)? If yes please explain:

L59 In your opinion can the programme be improved? If yes, please explain how:

L60 Can you indicate some reference concerning the programme/instrument (e.g. weblink)?

L61 In addition, can you provide us with an informative document related to the programme? (please upload the file if applicable)

L62 Any other relevant aspects you would like to mention? Please comment below:

L63 Are you aware of any other initiatives (e.g. tax incentives, discount schemes, etc.) or similar national or regional policies that support the same objective as funding schemes for last-mile infrastructure without providing direct funding? If yes please comment:

L64 Assessment of existing programmes

L65 Did your organisation benefit from existing programmes?

- ❍ Yes (1)
- ❍ No (2)

If "Yes" is Selected, the questionnaire will skip to question L69. If "No" is chosen the questionnaire will continue as follows:

L66 You did not benefit from existing programmes because:

- ❍ You never applied (1)
- ❍ You applied without being successful (2)

If "You applied without being successful" is selected the questionnaire will skip to question L85. If "You never applied" is selected it will continue as follows.

L67 Please indicate the reason for not having applied (multiple choices can be selected):

- ❑ Insufficient information about the scheme/application process (1)
- ❑ Application process too complex (2)
- ❑ Funding was not adequate due to insufficient amount/coverage (please explain) (3) ________________________
- ❑ Direct relevance to last mile infrastructure unclear (4)
- ❑ Not qualifying as beneficiary (please explain) (5) ________________________
- ❑ No need of funding for last mile infrastructure (please explain) (6) ________________________
- ❑ Other (please explain) (7) ________________________

L68 Please explain:

If "No" was previously selected with regard to question L65 "Did your organisation benefit from existing programmes?" the questionnaire will skip to question L85. If "Yes" was sleceted it will continue as follows:

L69 Please indicate the name of the instrument/programme, the year(s) of adoption and the geographical region covered:

Instrument/Programme name (1)
Year(s) (2)
Geographical region (3)

L70 Please specify the type of measure that has been funded:

L71 Indicate the category to which it belongs (multiple choices can be selected):

- ❑ New construction (1)
- ❑ Revitalisation (2)
- ❑ Modernisation (3)
- ❑ Other (please specify) (4) ____________________

L72 On a scale of 1 to 10, how user-friendly was the scheme (minimum: 1 - maximum: 10)?

______ Level (1)

L73 Please comment:

L74 Does the facility co-funded still exist and is still operational and used?

- ❍ Yes (1)
- ❍ No (2)
- ❍ I don't know (3)

L75 Have the programme or instrument had a positive impact? If so in which terms? (multiple choices can be selected)

- ❑ Transport flow (1)
- ❑ Financial performance of the company (2)
- ❑ Other (please specify) (3) ____________________

L76 Overall, on a scale of 1 to 10, how would you assess the identified positive impact(s) of the scheme (minimum: 1 - maximum: 10)?

______ Level (1)

L77 Please explain, indicating also if you experienced negative impacts with the programme:

L78 Has the scheme helped increase the flow of goods transported by rail, in your view?

- ❍ Yes (1)
- ❍ No (2)

L79 If yes, please indicate the approximate percentage of growth reached:

L80 Would you recommend this scheme as a best practice example?

- ❍ Yes (1)
- ❍ No (2)

L81 If yes, please explain in which terms it was a best practice example. If no, comment your answer:

L82 Would you have realized the development measures also without the funding provided by the programme? Please explain:

L83 What could be improved in the scheme? Please comment:

L84 Past programmes and additional support measures

L85 Did your organisation benefit from dedicated or other relevant past programmes at EU/national/regional/local level?

- ❍ Yes (1)
- ❍ No (2)

If "Yes" is selected the questionnaire will skip to question L89. If "No" is selected it will continue as follows:

L86 You did not benefit from past programmes because:

- ❍ You never applied (1)
- ❍ You applied without being successful (2)

If "You applied without being successful" is selected, the questionnaire will skip to the end (L103). If "No" is selected it will continue as follows.

L87 Please indicate the reason for not having applied (multiple choices can be selected):

- ❑ Insufficient information about the scheme/application process (1)
- ❑ Application process too complex (2)
- ❑ Funding was not adequate due to insufficient amount/coverage (please explain) (3) ______________________
- ❑ Direct relevance to last mile infrastructure unclear (4)
- ❑ Not qualifying as beneficiary (please explain) (5) ______________________
- ❑ No need of funding for last mile infrastructure (please explain) (6) ______________________
- ❑ Other (please explain) (7) ______________________

L88 Please explain:

If "No" was previously selected in relation to question L85 "Did your organisation benefit from dedicated or other relevant past programmes at EU/national/regional/local level?" the questionnaire will skip to the end (L103). If "Yes" was previously selected it will continue as follows:

L89 Please indicate the name of the instrument/programme, the year(s) of adoption and the geographical region covered:

Instrument/Programme name (1)
Year(s) (2)
Geographical region (3)

L90 Please specify the type of measure funded:

L91 Indicate the category to which it belongs (multiple choices can be selected):

❑ New construction (1)
❑ Revitalisation (2)
❑ Modernisation (3)
❑ Other (please specify) (4) ____________________

L92 On a scale of 1 to 10, how user-friendly was the scheme (minimum: 1 - maximum: 10)?

______ Level (1)

L93 Please comment:

L94 Has the programme or instrument had a positive impact(s)? If so in which terms? (multiple choices can be selected)

❑ Transport flow (1)
❑ Financial performance of the company (2)
❑ Other (please specify) (3) ____________________

L95 Overall, on a scale of 1 to 10, how would you assess the identified positive impact(s) of the scheme (minimum: 1 - maximum: 10)?

______ Level (1)

L96 Please explain, indicating also if you experienced negative impacts with the programme:

L97 Has the scheme helped increase the flow of goods transported by rail, in your view?

❍ Yes (1)
❍ No (2)

L98 If yes, please indicate the approximate percentage of growth reached:

L99 Would you recommend this scheme as a best practice example?

❍ Yes (1)
❍ No (2)

L100 If yes, please explain in which terms it was a best practice example. If no, comment your answer:

L101 Would you have realized the development measures also without the funding provided by the programme? Please explain:

L102 What could be improved in the scheme? Please comment:

L103 We are grateful for the time and effort you took to fill the questionnaire! To complete the survey please provide us with the following information: Identification Form

Company/ Organisation (3)
Name (1)
Surname (2)
Position/Role within your organisation (4)
City (5)
Country (6)
Telephone (8)
Email address (7)

L104 Do you allow us to pass on your answers to the European Commission with your identification details attached to them:

- Yes (1)
- No (4)

L105 In case the European Commission wishes to do so, would you allow the EC to make your answers public with your identification details attached to them:

- Yes (1)
- No (2)

L106 Please note that we may contact you should we have any questions related to the data provided.

L107 In case you experienced problems with filling the questionnaire or you need additional support do not hesitate to get in touch with us by sending an email to: pwc-stakeholderconsultation@it.pwc.com

Annex C – Questionnaires (Phase 2)

The following represents the questionnaires template for Task 4 the Stakeholders have been asked to fill.

Questionnaire 1 – Railway associations & Industries

L1 Preface

In the last few years, the focus of the EU and the respective Member States has been mainly on the completion of Rail Freight and TEN-T Corridors. Nevertheless, it is essential to also consider the access points to these corridors. Indeed, last-mile infrastructure is a crucial element of the rail system (providing an entry point to the corridors). Various studies have highlighted the importance of developing last-mile infrastructure to enhance wagonload traffic and rail freight in general. However, many sidings were built more than 50 years ago and are in great need of upgrades. The lack of adequate funding can lead to their abandonment, which in turn could force certain categories of shippers to stop considering rail as a viable logistic option, being no longer linked to the rail network.

L2 Objectives of the questionnaire

Since there is no comprehensive overview on the existing last-mile infrastructure in Europe, the present questionnaire is aimed to collect useful data on the status and expected developments of the infrastructure so as to quantify the future needs and potentials of investments for construction, revitalisation and modernisation along the entire European rail network.

L3 Your contribution

Within this context your contribution is of the utmost importance, as the information you will provide will determine the successful completion of the current study, ensuring great benefits for the European Commission, the wide range of stakeholders involved and the sector as a whole.

L4 Privacy and Confidentiality

Please note that answers to this survey will be reported in an aggregated format only and all data about your organisation will not be disclosed without your consent.

L5 Support

Should you require any support with the completion of the survey please contact us at:

pwc-stakeholderconsultation@it.pwc.com

Stakeholder Information

Please provide us with some general information about you and your organisation:

Name (3)
Surname (4)
Organisation name (1)
Branch Industry (2)
City (7)
Country (8)
Telephone No. (6)

Please provide us with some specific information about the geographical location of your siding:

Region (1)
City (2)
Country (3)

Please select the type of siding closest to the one you operate (see below the corresponding graphic illustration):

- ❍ A) "Simple" private siding (i.e. without own rail operation devices as small locomotives, dual mode tractor, etc.) (1)
- ❍ B) Private siding with own rail operation devices (e.g. small locomotives, dual mode tractor, etc.) (2)
- ❍ C) Industrial Railway with rail network and multiple rail operation devices and trasport volumes (3)

A) B) C)

Please insert any other information you may consider relevant to describe your siding:

Please provide us with some general information about the existing infrastructure:

1) Rail Tracks

	Inbound/outbound tracks (1)	Loading/unloading tracks (2)	Parking tracks (3)	Other (4)
Number (2)				
Total lenght (m) (3)				
Average maturity (years) (8)				
Yearly maintenance costs (€ p.a.) (5)				

Please define the category "Other" in case you filled in the corresponding blanks:

2) Switches

	Remotely electric operated (1)	Manually operated (2)	Locally electric operated (3)
Number (2) Average maturity (years) (8) Yearly maintenance costs (€ p.a.) (5)			

3) Operational infrastructure

	Control centres (1)	Signals (2)	Other (3)
Number (2) Average maturity (years) (8) Yearly maintenance costs (€ p.a.) (5)			

Please define the categoy in case you filled in the corresponding blanks:

4) Transhipment facilities

	Facility 1 (1)	Facility 2 (2)	Facility 3 (3)
Conventional or intermodal (2) Type of facility (please describe) (10) Number (11) Average maturity (years) (8) Yearly maintenance costs (€ p.a.) (5)			

Capacity and Transport Volume

Please indicate the freight traffic handled by your siding, filling in the blank fields as appropriate. Consider 2013 as reference year for the information provided (if not available please indicate the most recent reference year at your disposal).

Reference year (3)
Annual number of block trains (1)
Annual number of Loading Units (intermodal transport via private sidings only) (2)

Additional data on freight traffic handled by your siding:

	Block trains (1)	Single wagons/wagon groups (2)	Intermodal transport via private siding (3)
Annual number of wagons (1)			
Total transport volume (t. p.a.) (2)			
- of which inbound transport volume (t. p.a.) (3)			
- of which outbound transport volume (t. p.a.) (4)			

Please indicate the three most important commodities transported:

	Commodity 1 (1)	Commodity 2 (2)	Commodity 3 (3)
Inbound transport (1)			
Outbound transport (2)			

Please provide an estimate of the current capacity utilisation of your rail infrastructure (select more than 100% in case an extension of capacity is considered necessary):

- ❍ Less than 25% (1)
- ❍ Between 25% and 50% (2)
- ❍ 50% (3)
- ❍ Between 50% and 75% (4)
- ❍ Between 75% and 100% (5)
- ❍ More than 100% (6)

Past and future development of rail transport

Please indicate the past and future expected development of rail transport volumes (specifying whether the percentages refer to an increase or a decrease) :

	Volume for block trains (%) (1)	Volume for single wagons/wagon groups (%) (2)	Volume for intermodal transport via private siding (%) (3)
Last 5 years (1)			
Expectations for the upcoming 5 years (2)			
Long-term expectation until 2030 (3)			

Are you planning to invest in your rail infrastructure during the upcoming 5 years?

- ❍ Yes (4)
- ❍ No (5)
- ❍ I don't know (6)

If yes please provide us with a description of the investment, including the planned cost volume and the expected year of realisation:

Description of the investment (3)
Planned cost volume (€) (1)
Foreseen year of realisation (2)

Does the planned investment in rail infrastructure involve public co-funding?

- ❍ Yes (1)
- ❍ No (2)

If yes please indicate which kind of funding programme supports the investment, including the amount claimed and the reference year:

Name of the programme (1)
Amount claimed (€) (2)
Reference year (3)

Thank You!

We are grateful for the time and effort you took to fill the questionnaire! To complete the survey please provide us with the following information:

Do you allow us to pass on your answers to the European Commission with your identification details attached:

- Yes (1)
- No (4)

In case the European Commission wishes to do so, would you allow the EC to make your answers public with your identification details attached:

- Yes (1)
- No (2)

Please note that we may contact you should we have any questions related to the data provided. Therefore, we kindly ask you to specify below the preferred email address to reach you at:

In case you experience problems when filling the questionnaire or should you need additional support do not hesitate to get in touch with us by sending an email to: pwc-stakeholderconsultation@it.pwc.com

Questionnaire 2 – Infrastructure managers

L1 Preface

In the last few years, the focus of the EU and the respective Member States has been mainly on the completion of Rail Freight and TEN-T Corridors. Nevertheless, it is essential to also consider the access points to these corridors. Indeed, last-mile infrastructure is a crucial element of the rail system (providing an entry point to the corridors). Various studies have highlighted the importance of developing last-mile infrastructure to enhance wagonload traffic and rail freight in general. However, many sidings were built more than 50 years ago and are in great need of upgrades. The lack of adequate funding can lead to their abandonment, which in turn could force certain categories of shippers to stop considering rail as a viable logistic option, being no longer linked to the rail network.

L2 Objectives of the questionnaire

Since there is no comprehensive overview on the existing last-mile infrastructure in Europe, the present questionnaire is aimed to collect useful data on the status and expected developments of the infrastructure so as to quantify the future needs and potentials of investments for construction, revitalisation and modernisation along the entire European rail network.

L3 Your contribution

Within this context your contribution is of the utmost importance, as the information you will provide will determine the successful completion of the current study, ensuring great benefits for the European Commission, the wide range of stakeholders involved and the sector as a whole.

L4 Privacy and Confidentiality

Please note that answers to this survey will be reported in an aggregated format only and all data about your organisation will not be disclosed without your consent.

L5 Support

Should you require any support with the completion of the survey please contact us at:

pwc-stakeholderconsultation@it.pwc.com

Stakeholder Information

Please provide us with some general information about you and your organisation:

Name (3)
Surname (4)
Organisation name (1)
Branch Industry (2)
City (7)
Country (8)
Telephone No. (6)

Transport Volume and Capacity

Please indicate the number of rail stations with public loading tracks for conventional transport that you own/manage:

Please indicate the rail transport volumes for conventional transport - both total and broken down per commodity type (please list the main ones) - transhipped via your rail stations:

	Wagons p.a. (1)	Tonnes p.a. (2)
Total transhipment volume (1)		
Volume per commodity type (list the main ones): (2)		
Commodity 1 (3)		
Commodity 2 (4)		
Commodity 3 (5)		
Commodity 4 (6)		
Commodity 5 (7)		

Please provide an estimate of the current capacity utilisation of your rail stations with public loading tracks (select than 100% in case an extension of capacity is considered necessary):

- ❍ Less than 25% (1)
- ❍ Between 25% and 50% (2)
- ❍ 50% (3)
- ❍ Between 50% and 75% (4)
- ❍ Between 75% and 100% (5)
- ❍ More than 100% (6)

Past and future development of rail transport

Please indicate both the past trend and your expectations for the future development of transhipment volumes in the table below (specifying whether the percentages refer to an increase or a decrease;) :

	Estimate of transhipment volume (in % p.a.) (1)
Last 5 years (1)	
Expectations for the upcoming 5 years (2)	
Long-term expectation until 2030 (3)	

Please indicate both the past trend and your expectations for the future development concerning the number of rail stations with public loading tracks that you own/manage (specifying whether the percentages refer to an increase "+" or a decrease "-") :

	Estimate of number of rail stations with public loading tracks (1)
Last 5 years (1)	
Expectations for the upcoming 5 years (2)	
Long-term expectation until 2030 (3)	

Are you planning to invest in the rail infrastructure for the stations with public loading tracks that you own/manage during the upcoming 5 years?

- ❍ Yes (4)
- ❍ No (5)
- ❍ I don't know (6)

If yes, please provide us with a description of the investment, including the planned cost volume and the expected year of realisation:

Description of the investment (1)
Planned cost volume (€) (2)
Foreseen year of realisation (3)

Does the planned investment involve public co-funding?

- ❍ Yes (1)
- ❍ No (2)

If yes please indicate which kind of funding programme supports the investment, including the amount claimed and the reference year:

Name of the programme (1)
Amount claimed (€) (2)
Reference year (3)

Thank You!

We are grateful for the time and effort you took to fill the questionnaire! To complete the survey please provide us with the following information:

Do you allow us to pass on your answers to the European Commission with your identification details attached:

- Yes (1)
- No (4)

In case the European Commission wishes to do so, would you allow the EC to make your answers public with your identification details attached:

- Yes (1)
- No (2)

Please note that we may contact you should we have any questions related to the data provided. Therefore, we kindly ask you to specify below the preferred email address to reach you at:

In case you experience problems when filling the questionnaire or should you need additional support do not hesitate to get in touch with us by sending an email to: pwc-stakeholderconsultation@it.pwc.com

Questionnaire 3 – Port Authorities, Port Terminals

L1 Preface

In the last few years, the focus of the EU and the respective Member States has been mainly on the completion of Rail Freight and TEN-T Corridors. Nevertheless, it is essential to also consider the access points to these corridors. Indeed, last-mile infrastructure is a crucial element of the rail system (providing an entry point to the corridors). Various studies have highlighted the importance of developing last-mile infrastructure to enhance wagonload traffic and rail freight in general. However, many sidings were built more than 50 years ago and are in great need of upgrades. The lack of adequate funding can lead to their abandonment, which in turn could force certain categories of shippers to stop considering rail as a viable logistic option, being no longer linked to the rail network.

L2 Objectives of the questionnaire

Since there is no comprehensive overview on the existing last-mile infrastructure in Europe, the present questionnaire is aimed to collect useful data on the status and expected developments of the infrastructure so as to quantify the future needs and potentials of investments for construction, revitalisation and modernisation along the entire European rail network.

L3 Your contribution

Within this context your contribution is of the utmost importance, as the information you will provide will determine the successful completion of the current study, ensuring great benefits for the European Commission, the wide range of stakeholders involved and the sector as a whole.

L4 Privacy and Confidentiality

Please note that answers to this survey will be reported in an aggregated format only and all data about your organisation will not be disclosed without your consent.

L5 Support

Should you require any support with the completion of the survey please contact us at:

pwc-stakeholderconsultation@it.pwc.com

Stakeholder Information

Please provide us with some general information about you and your organisation:

Name of Railport/Railport location (11)
Name (3)
Surname (4)
Organisation name (1)
Branch Industry (2)
City (7)
Country (8)
Telephone no. (6)

Please indicate the entity in charge of the development of rail infrastructure:

- ❍ Port Authority (1)
- ❍ Rail Infrastructure Manager (2)
- ❍ Other (specify) (3) ______________________

Please provide us with some general information about the existing infrastructure:

1) Rail Tracks

	Inbound/outbound tracks (1)	Loading/unloading tracks (2)	Parking tracks (3)	Other (4)
Number (2)				
Lenght (m) (3)				
Average maturity (years) (8)				
Yearly maintenance costs (€ p.a.) (5)				

Please define the category "Other" in case you filled in the corresponding blanks:

2) Switches

	Remotely electric operated (1)	Manually operated (2)	Locally electric operated (3)
Number (2)			
Average maturity (years) (8)			
Yearly maintenance costs (€ p.a.) (5)			

3) Operational infrastructure

	Control centres (1)	Signals (2)	Other (3)
Number (2) Average maturity (years) (8) Yearly maintenance costs (€ p.a.) (5)			

Please define the category in case you filled in the corresponding blanks:

4) Transhipment facilities

	Facility 1 (1)	Facility 2 (2)	Facility 3 (3)
Specify whether for conventional or intermodal (2) Type of facility (please describe) (10) Number (11) Average maturity (years) (8) Yearly maintenance costs (€ p.a.) (5)			

Capacity and Transport Volume

Please indicate the freight traffic handled by your siding, filling in the blank fields as appropriate. Consider 2013 as reference year for the information provided (if not available please indicate the most recent reference year at your disposal).

Reference year (3)
Annual number of block trains (1)

Additional data on freight traffic handled by rail transport:

	Block trains (1)	Single wagons/wagon groups (2)
Annual number of wagons (1)		
Total transport volume (t. p.a.) (2)		
-of which inbound transport volume (t. p.a.) (3)		
-of which outbound transport volume (t. p.a.) (4)		

Please indicate the three most important commodities transported:

	Commodity 1 (1)	Commodity 2 (2)	Commodity 3 (3)
Inbound transport (1)			
Outbound transport (2)			

Please provide an estimate of the current capacity utilisation of your rail infrastructure (select more than 100%; in case an extension of capacity is considered necessary):

❍ Less than 25% (1)
❍ Between 25% and 50% (2)
❍ 50% (3)
❍ Between 50% and 75% (4)
❍ Between 75% and 100% (5)
❍ More than 100% (6)

Past and future development of rail transport

Please indicate the past and future expected development of rail transport volumes (specifying whether the percentages refer to an increase or a decrease) :

	Volume for block trains (%) (1)	Volume for single wagons/wagon groups (%) (2)
Last 5 years (1)		
Expectations for the upcoming 5 years (2)		
Long-term expectation until 2030 (3)		

Are you planning to invest in your rail infrastructure during the upcoming 5 years?

- ❍ Yes (4)
- ❍ No (5)
- ❍ I don't know (6)

If yes please provide us with a description of the investment, including the planned cost volume and the expected year of realisation:

Description of the investment (3)
Planned cost volume (€) (1)
Foreseen year of realisation (2)

Does the planned investment in rail infrastructure involve public co-funding?

- ❍ Yes (1)
- ❍ No (2)

If yes please indicate which kind of funding programme supports the investment, including the amount claimed and the reference year:

Name of the programme (1)
Amount claimed (€) (2)
Reference year (3)

Thank You!

We are grateful for the time and effort you took to fill the questionnaire! To complete the survey please provide us with the following information:

Do you allow us to pass on your answers to the European Commission with your identification details attached:

- ❍ Yes (1)
- ❍ No (4)

In case the European Commission wishes to do so, would you allow the EC to make your answers public with your identification details attached:

- ❍ Yes (1)
- ❍ No (2)

Please note that we may contact you should we have any questions related to the data provided. Therefore, we kindly ask you to specify below the preferred email address to reach you at:

In case you experience problems when filling the questionnaire or should you need additional support do not hesitate to get in touch with us by sending an email to: pwc-stakeholderconsultation@it.pwc.com

Questionnaire 4 – Associations, Logistic associations, Logistc nodes/Freight villages managers, Rail Road terminal Managers

L1 Preface

In the last few years, the focus of the EU and the respective Member States has been mainly on the completion of Rail Freight and TEN-T Corridors. Nevertheless, it is essential to also consider the access points to these corridors. Indeed, last-mile infrastructure is a crucial element of the rail system (providing an entry point to the corridors). Various studies have highlighted the importance of developing last-mile infrastructure to enhance wagonload traffic and rail freight in general. However, many sidings were built more than 50 years ago and are in great need of upgrades. The lack of adequate funding can lead to their abandonment, which in turn could force certain categories of shippers to stop considering rail as a viable logistic option, being no longer linked to the rail network.

L2 Objectives of the questionnaire

Since there is no comprehensive overview on the existing last-mile infrastructure in Europe, the present questionnaire is aimed to collect useful data on the status and expected developments of the infrastructure so as to quantify the future needs and potentials of investments for construction, revitalisation and modernisation along the entire European rail network.

L3 Your contribution

Within this context your contribution is of the utmost importance, as the information you will provide will determine the successful completion of the current study, ensuring great benefits for the European Commission, the wide range of stakeholders involved and the sector as a whole.

L4 Privacy and Confidentiality

Please note that answers to this survey will be reported in an aggregated format only and all data about your organisation will not be disclosed without your consent.

L5 Support

Should you require any support with the completion of the survey please contact us at:

pwc-stakeholderconsultation@it.pwc.com

Stakeholder Information

Please provide us with some general information about you and your organisation:

Name of Terminal/Terminal location (11)
Name (3)
Surname (4)
Organisation name (1)
Branch Industry (2)
City (7)
Country (8)
Telephone No. (6)

Please select the type/function of the terminal:

- ❍ Handling of maritime traffic (port or hinterland located) (1)
- ❍ Handling of continental traffic (2)
- ❍ Handling of maritime and continental traffic (3)
- ❍ Rail/Road or Rail/Road/Inland waterway (4)
- ❍ Other (please specify) (5) _______________________

Please provide us with some general information about the existing infrastructure:

1) Rail Tracks

	Inbound/outbound tracks (1)	Transhipment tracks (2)	Parking tracks (e.g. empty/damaged wagons) (3)	Other (4)
Number (2)				
Lenght (m) (3)				
Average maturity (years) (8)				
Yearly maintenance costs (€ p.a.) (5)				

Please define the category "Other" in case you filled in the corresponding blanks:

2) Switches

	Remotely electric operated (1)	Manually operated (2)	Locally electric operated (3)
Number (2)			
Average maturity (years) (8)			
Yearly maintenance costs (€ p.a.) (5)			

3) Operational infrastructure

	Control centres (1)	Signals (2)	Other (3)
Number (2) Average maturity (years) (8) Yearly maintenance effort (€ p.a.) (5)			

Please define the category in case you filled in the corresponding blanks:

4) Infrastructure for loading/unloading

	Gantry cranes (1)	Reach stacker (2)	Other (3)
Number (2) Average maturity (years) (8) Investment (value of asset in €) (11) Yearly maintenance effort (€ p.a.) (5) Yearly maintenance effort (% of value p.a.) (10)			

Please define the category in case you filled in the corresponding blanks:

Transport Volume and Capacity

Please indicate the freight traffic handled by your siding, filling in the blank fields as appropriate. Consider 2013 as reference year for the information provided (if not available please indicate the most recent reference year at your disposal).

Reference year (3)

Maritime Intermodal transport volumes for "Containers" and "TEU":

	Containers (1)	TEU (2)
Maritime transport - Annual number of (1)		

Continental Intermodal transport volumes for "Containers", "Swap bodies" and "Semi-trailers":

	Containers (1)	Swap bodies (2)	Semi-trailers (3)
Continental transport - Annual number of (1)			

Please provide an estimate of the current capacity utilisation of your rail infrastructure (select "more than 100%" in case an extension of capacity is considered necessary):

- ❍ Less than 25% (1)
- ❍ Between 25% and 50% (2)
- ❍ 50% (3)
- ❍ Between 50% and 75% (4)
- ❍ Between 75% and 100% (5)
- ❍ More than 100% (6)

Past and future development of rail transport

Please indicate the past and future expected development of rail transport volumes (specifying whether the percentages refer to an increase or a decrease) :

	Volume for intermodal block trains (%) (1)	Volume for intermodal single wagons/wagon groups (%) (2)
Last 5 years (1)		
Expectations for the upcoming 5 years (2)		
Long-term expectation until 2030 (3)		

Are you planning to invest in your rail infrastructure during the upcoming 5 years?

- ❍ Yes (4)
- ❍ No (5)
- ❍ I don't know (6)

If yes please provide us with a description of the investment, including the planned cost volume and the expected year of realisation:

Description of the investment (3)
Planned cost volume (€) (1)
Foreseen year of realisation (2)

Does the planned investment in rail infrastructure involve public co-funding?

- ❍ Yes (1)
- ❍ No (2)

If yes please indicate which kind of funding programme supports the investment, including the amount claimed and the reference year:

Name of the programme (1)
Amount claimed (€) (2)
Reference year (3)

Thank You!

We are grateful for the time and effort you took to fill the questionnaire! To complete the survey please provide us with the following information:

Do you allow us to pass on your answers to the European Commission with your identification details attached:

- ❍ Yes (1)
- ❍ No (4)

In case the European Commission wishes to do so, would you allow the EC to make your answers public with your identification details attached:

- ❍ Yes (1)
- ❍ No (2)

Please note that we may contact you should we have any questions related to the data provided. Therefore, we kindly ask you to specify below the preferred email address to reach you at:

In case you experience problems when filling the questionnaire or should you need additional support do not hesitate to get in touch with us by sending an email to: pwc-stakeholderconsultation@it.pwc.com

Asdasd

Annex D – Dedicated programmes

Austria	
Programme/Instrument: Programm für die Unterstützung des Ausbaues von Anschlussbahnen	
Time frame:	1st January 2013 – 31st December 2017
Scale of the programme – total funding volume:	Ca. € 210 million
Usage - volume of applications:	Ca. € 210 million
Usage - number of project financed:	360
Usage – number of project successfully completed:	Ca. 350
Average contribution provided	€ 575,000
Type of investments covered:	• Privately operated rail infra-and suprastructures (Sidings & related infrastructures); • Loading/unloading facilities and machinery. Switches are not part of the funding programme, as they are (and have to be) integral part of the public railway infrastructure network (mainly ÖBB Infrastruktur).
Eligible costs:	Non-eligible costs include: • Costs incurred before the application; • Internal transport systems or parts of the same , as far as they are not directly serve the project; • Land acquisition; • Buildings which are not directly related to the transhipment services; • repair and maintenance tasks of all kinds; • Purchase of low-value items not part of the fixed assets of the Applicant Company; • Purchase of equipment and tools which are not immediately related to the transhipment services; • Road vehicles which are not directly related to the transhipment services; Payment of experts - except for projecting costs up to 5 % of the recognized project and the company's own supervision.
Eligible beneficiaries:	Companies with production / distribution sites in Austria.
Eligibility criteria:	The scheme supports projects for an amount of at least € 15,000 each.
Form of financing:	Non-repayable subsidies up to a maximum amount of 2.5 MEuro (new siding) or 2.0 MEuro (extention of existing siding). There is the contractual duty of repayment, if the beneficiary fails to meet his contractual obligations.
Method of calculating financial assistance:	No specific method is applied. Eligible expenses are “simply” multiplied by the corresponding funding quota (see next question) to determine the maximum funding volume that becomes part of the subsidy contract.
Share of funding - % eligible costs:	Share of funding between 25% and 50% of investment, depending on measures.

Share of EU co-financing:	-
Conditions for funding:	Primarily the decrease of road transport (Tons of cargo shifted from road to rail p.a., saved tKm road transport, reduction of CO2 Emissions). The ex-ante definition of cargo volumes serviced by the siding is obligatory in the application phase of the funding process (see application form, available in German language) and (once funding is granted) integral part of the subsidy contract (5 years monitoring).
Relation with territorial planning:	No direct connections: Spatial / territorial planning in Austria is in the competence of the provincial governments. Obviously, consultation and coordination with Austria's major railway infrastructure provider (ÖBB-Infra) are an integrated part of the application procedures.
Example of companies or other entities that already received this funding for investing in last-mile:	Companies include: VOEST ALPINE, Lenzing AG, OMV, Hafen Wien, SAPPI, etc. Numerous companies, mainly in the following branches: Paper, wood, lumber, waste recycling, primary production in general.

Person(s) responsible (if any):

Dipl.-Ing. Franz SCHWAMMENHÖFER MBA

Contact details:

Affiliation:

Bundesministerium für Verkehr, Innovation und Technologie II/Infra 4 Gesamtverkehr

Radetzkystraße 2, A-1030 Wien

Phone number: +43 1 711 62 - 65 1701

E-mail address: franz.schwammenhoefer@bmvit.gv.at

Or

Mag. Christine Kierner, SCHIG mbH

Mag. Rudolf Sebastnik, SCHIG mbH

Contact details:

Affiliation:

Schieneninfrastrukturdienstleistungsgesellschaft m.b.H (SCHIG mbH)

Lassallestraße 9b, A-1020 Wien

Phone number: +43 1 81273 43 – 1404

E-mail address: r.sebastnik@schig.com; c.kierner@schig.com

Weblink for source of information:

http://www.bmvit.gv.at/verkehr/eisenbahn/anschlussbahnen.html

<table>
<tr><th colspan="2">Germany</th></tr>
<tr><td colspan="2">Programme/Instrument: Richtlinie zur Förderung des Neu- und Ausbaus sowie der Reaktivierung von privaten Gleisanschlüssen</td></tr>
<tr><td>Time frame:</td><td>2004 – 2012 (extended to August 2016)</td></tr>
<tr><td>Scale of the programme – total funding volume:</td><td>N/D</td></tr>
<tr><td>Usage - volume of applications:</td><td>N/D</td></tr>
<tr><td>Usage - number of project financed:</td><td>N/D</td></tr>
<tr><td>Usage – number of project successfully completed:</td><td>N/D</td></tr>
<tr><td>Average contribution provided</td><td>N/D</td></tr>
<tr><td>Type of investments covered:</td><td>The programme provides funding to companies intended to:
build new track infrastructure;
reactivate tracks currently out of use;
link existing railway lines with industrial areas.</td></tr>
<tr><td>Eligible costs:</td><td>Eligible costs include expenditures for railway systems necessary to operate the sidings, loading and unloading freight wagons, other necessary facilities and equipment, etc.

Non-eligible costs include systems for managing internal traffic, expenses for land acquisition (except for exceptional cases), railway shunters, leasing-funded facilities and equipment, etc.</td></tr>
<tr><td>Eligible beneficiaries:</td><td>-</td></tr>
<tr><td>Eligibility criteria:</td><td>The construction project must not have commenced when applying and the amount of the grant must exceed a minimum threshold of € 15,000.</td></tr>
<tr><td>Form of financing:</td><td>Non-repayable grants</td></tr>
<tr><td>Method of calculating financial assistance:</td><td>Funding is a function of the expected additional traffic generated on the railway. Financial support for the construction of new sidings and the reactivation/extension of existing ones must not exceed the thresholds presented in the table below:
<table>
<tr><th>Construction of new sidings</th><th>Reactivation/Extension of existing sidings</th></tr>
<tr><td>8 € / tonne per annum

or

32 € / 1,000 tonne-km per annum</td><td>6 € / tonne per annum

or

24 € / 1,000 tonne-km per annum</td></tr>
</table></td></tr>
<tr><td>Share of funding - % eligible costs:</td><td>Up to 50%</td></tr>
<tr><td>Share of EU co-financing:</td><td>-</td></tr>
<tr><td>Conditions for funding:</td><td>The construction/extension/reactivation of railway sidings must entail an actual, substantial, measurable and sustainable transport of freight by rail which would not otherwise have occurred.</td></tr>
</table>

	The applicant shall demonstrate the expected traffic performance (traffic in tonnes per annum and transport performance on German railways in tonne-km per annum) and the commitment to its achievement. Compliance with the annual transport undertakings in the 5-year period is checked by the granting authority. By the end of the fourth year of the 5-year period it may be extended – at request – to 7 years. In case of non-compliance with the transport undertakings, the funding has to be repaid back in proportion. The applicant shall provide a bank guarantee or an equivalent warranty to secure the repayment of the obligation. The use of the subsidized rail connection must not be in competition with existing CT systems.
Relation with territorial planning:	-
Example of companies or other entities that already received this funding for investing in last-mile:	

Person(s) responsible (if any):

Contact details: N/D

Affiliation: N/D

Phone number: N/D

E-mail address: N/D

Weblink for source of information:

http://www.gleisanschluss.info/home2.html

Switzerland	
Programme/Instrument: Aides financières pour voies de raccordement	
Time frame:	1986 – undefined
Scale of the programme – total funding volume:	Ca. € 275 million
Usage - volume of applications:	Ca. € 245 million
Usage - number of project financed:	1508
Usage – number of project successfully completed:	1473
Average contribution provided	€ 166,231 per project
Type of investments covered:	New construction, extension and renewal of sidings
Eligible costs:	Eligible costs include: the costs of planning, preparation and construction of sidings, as well as all expenses incurred concerning the fixed railway equipment (rails, connections, connections to the signal box, catenary, signals, insulation, flashing signal lights or gates, heating cables, derailment devices, sprags, track lighting, etc.). Calculations are based on gross construction costs (7.6% VAT included). A non-exhaustive list of eligible costs include: • Costs directly related to the construction of the sidings (maximum 2 m from the center of the rail track); • Preparatory work (e.g. the rehabilitation of existing facilities is eligible only when it is essential for the functionality of the new facilities); • The infrastructure within the sidings section (i.e. the constructions necessary to the realization of the sidings normally justify a contribution - bridges, embankments, correction streams, etc.); • Costs for surfacing works up to 4 m wide, and the coating between the sidings; • Costs for crossing security devices; • Costs for measuring noise abatement; • Costs for heating cables electric systems; • Planning fees and charges; • Various unexpected costs certified in the final account. In case of cheaper options for some parts of installation, the eligible costs have to be reduced by the difference. A non-exhaustive list of partially eligible costs include: • Excavation of building lots, drainage, drains, retaining walls, pedestrian bridges; • Telephone and radio devices partially useful for exploitation; • Information on signs, urbanization, entrepreneurial work of the loading hall; • Costs for the underpasses of the railway/road. A non-exhaustive list of non-eligible costs include: • Allowances to authorities and commissions; • Costs for the acquisition and remuneration of construction loans; • Costs for means of traction (winches, cableway installations, etc.); • Costs for weigh bridges; • Costs for trans-shipment facilities (ramps, quay walls, loading platforms, loading

<table>
<tr><td></td><td>
plates, portal frames, roller gates or rolls/drop doors, elevator shafts, service tanks, blowers, pallets handling facilities, unloading pits, storage tanks, pipes, pumps, conveyor belts, conveyor bridges, operating devices, cranes, compressors, weighbridges, etc.);
• Railway subsidies for a joint use in accordance with the contractual regulations.

Finally, a non-exhaustive list of costs notoriously considered as non-eligible include:

• Land and rights acquisition;
• Expenditures for the clean-up of ditches;
• Works on an adjacent site (e.g. building/adaptation of roads, coating repairs, landscaping works, sodding, outdoor lighting and rail slinging operations);
• Marketing costs and other related expenses;
• Rebates and any discounts granted;
• The abandonment without replacement of connections and track sections (e.g. rehabilitation/disinvestment);
• Works performed outside the rail track section concerned;

The costs for the maintenance of existing sidings.
</td></tr>
<tr><td>Eligible beneficiaries:</td><td>-</td></tr>
<tr><td>Eligibility criteria:</td><td>
Excluded from financial aid:

• maintenance of existing sidings;
• services of the federal government;
• projects abroad.
</td></tr>
<tr><td>Form of financing:</td><td>Non-repayable grants</td></tr>
<tr><td>Method of calculating financial assistance:</td><td>
For sidings or main private-sidings lines, the contribution rate is a function of the volume to be transported; for main public-sidings lines, the weighting depends on the number of connected sidings. The volume to be transported is defined generally in tonnes or number of cars if they weigh is less than 16.7 tonnes on average.

During the construction of a siding, the amount of financial assistance depends on the total volume transported over five years.

The following table provides the method for calculating the financial aid for sidings, main private-sidings lines (= tonnage/wagons) and main public-sidings lines (number of connected sidings) for all the applications filed since 1st January 2010.

<table>
<tr><th>Sidings and main private-sidings lines</th><th>Main public-sidings lines</th></tr>
<tr><td>Tonnage * / wagons (t/wg)</td><td>Number of connected sidings (at least two sidings eligible for the financial aid)</td></tr>
<tr><td>Up to 12'000 t / 720 wg. = 40 %</td><td></td></tr>
<tr><td>17'500 t / 1'050 wg = 41 %</td><td></td></tr>
<tr><td>25'000 t / 1'500 wg. = 42 %</td><td></td></tr>
<tr><td>37'500 t / 2'250 wg. = 43 %</td><td>Up to 2 = 40%</td></tr>
<tr><td>50'000 t / 3'000 wg. = 44 %</td><td></td></tr>
<tr><td>75'000 t / 4'500 wg. = 45 %</td><td></td></tr>
<tr><td>100'000 t / 6'000 wg. = 46 %</td><td>Up to 3 = 45%</td></tr>
<tr><td>150'000 t / 9'000 wg. = 47 %</td><td></td></tr>
<tr><td>200'000 t / 12'000 wg. = 48 %</td><td></td></tr>
<tr><td>300'000 t / 18'000 wg. = 49 %</td><td>Up to 4 = 50%</td></tr>
<tr><td>400'000 t / 24'000 wg. = 50 %</td><td></td></tr>
</table>
</td></tr>
</table>

	<table><tr><td></td><td>500'000 t / 30'000 wg. = 51 %</td><td></td></tr><tr><td></td><td>600'000 t / 36'000 wg. = 52 %</td><td>Up to 5 = 55%</td></tr><tr><td></td><td>700'000 t / 42'000 wg. = 53 %</td><td></td></tr><tr><td></td><td>800'000 t / 48'000 wg. = 54 %</td><td></td></tr><tr><td></td><td>900'000 t / 54'000 wg. = 55 %</td><td>More than 6 = 60%</td></tr><tr><td></td><td>1'000'000 t / 60'000 wg. = 56 %</td><td></td></tr><tr><td></td><td>1'100'000 t / 66'000 wg. = 57 %</td><td></td></tr><tr><td></td><td>1'200'000 t / 72'000 wg. = 58 %</td><td></td></tr><tr><td></td><td>1'300'000 t / 78'000 wg. = 59 %</td><td></td></tr><tr><td>More than</td><td>1'400'000 t / 84'000 wg. = 60 %</td><td></td></tr><tr><td colspan="3">*Net tonnage is defined as the loading weight of freight wagons excluding the tare weight. In combined transport, the weight of containers is included.</td></tr></table> When considering the extension and renewal of sidings, the additional volume to be transported is the key driver for defining the amount of the financial aid. In particular, it is considered the difference between the average volume transported during the last three years prior to the intervention and the one expected after it. If the volume remains unchanged the financial aid will correspond to the 40% of the eligible costs. It will instead increase by 1% for any 5% increase in the volume to be transported. If the eligible costs are above average, financial aid might be increased by maximum 5%, provided that the applicant cannot influence the causes of higher costs (e.g. they shall be due to municipal taxes, length of the sidings, geology, etc.).
Share of funding - % eligible costs:	Between 40% and 60%.
Share of EU co-financing:	-
Conditions for funding:	Grants are available only for sidings connected to stations or lines with a traffic volume of at least 12,000 tonnes/year or 720 wagons/year. The maximum federal co-financing is limited and cannot exceed € 29 (30 Swiss francs) for each tons transhipped annually through sidings, and € 4,235 (4400 Swiss francs) for each metre of "mother siding" (this term identifies tracks linking the main network with several sidings). The Confederation reduces its financial aid when, together with other public contributions, it exceed the 90% of the eligible costs. The Confederation does not grant funding less than € 28,892.
Relation with territorial planning:	-
Example of companies or other entities that already received this funding for investing in last-mile:	-
Person(s) responsible (if any): - Contact details: *Affiliation:* Federal Office of Transport	

CH-3003 Bern

Phone number: +41 (0)58/ 462 57 11

E-mail address: info@bav.admin.ch

Weblink for source of information:

http://www.bav.admin.ch/verlagerung/03063/03735/?lang=it

Annex E – Non-dedicated programmes

European Union	
Programme/Instrument: Shift2Rail Joint Undertaking (S2R JU) **Description:** The Shift2Rail Joint Undertaking (S2R JU) is a public-private partnership in the rail sector, established under Horizon 2020, to provide a platform for coordination of research activities with a view to driving innovation in the rail sector in the years to come. It was established on 7 July 2014, following the entry into force of Council Regulation (EU) No 642/2014 of 16 June 2014 establishing the Shift2Rail Joint Undertaking. The rationale for setting up a Joint Undertaking is that the pooling and coordination of R&I efforts at EU level stands a better chance of success given the transnational nature of the infrastructure and technologies to be developed in support of the Single European Railway Area, and the need to achieve a sufficient mass of resources. The main bodies of the S2R JU will be the Governing Board, in charge of strategic decision-making, and the Executive Director, responsible for day-to-day management of the S2R JU. The Founding Members of the S2R JU are the Union and 8 rail industry partners (Alstom, Ansaldo STS, Bombardier, Construcciones y Auxiliar de Ferrocarriles (CAF), Siemens and Thales, as well as infrastructure managers Network Rail and Trafikverket). The European Commission and the industrial JU members will have equal voting rights in the Governing Board.	
Time frame:	Since July 2014
Scale of the programme – total funding volume:	€920 million (for the period 2014-2020)
Usage - volume of applications:	Unknown
Usage - number of project financed:	Unknown
Usage – number of project successfully completed:	Unknown
Average contribution provided	Unknown
Type of investments covered:	Research and innovation of the rail system and its users facilitating amongst others a modal shift from road and air to rail. That approach shall cover rolling stock, infrastructure and traffic management for the market segments of freight and of long-distance, regional, local and urban passenger traffic, as well as intermodal links between rail and other modes, providing users with an integrated end-to-end solution for their rail travel and transport needs, from transaction support to en-route assistance – Article 2 (b) of Regulation 642/2014.
Eligible costs:	Research and innovation
Eligible beneficiaries:	-
Eligibility criteria:	Financial support for research and innovation indirect actions available to its members and to participants to achieve the programme objectives – Article 2 (e) of Annex 1 “Statutes of the Joint Undertaking”, Regulation 642/2014. According to Article 2 (2) of regulation 642/2014, these cover in particular actions seeking to develop, integrate, demonstrate, and validate innovative technologies and solutions that uphold the strictest safety standards and the value of which can be measured against, inter alia, the following key performance indicators: (a) a 50 % reduction of the life-cycle cost of the railway transport system, through a

	reduction of the costs of developing, maintaining, operating and renewing infrastructure and rolling stock, as well as through increased energy efficiency; (b) a 100 % increase in the capacity of the railway transport system, to meet increased demand for passenger and freight railway services; (c) a 50 % increase in the reliability and punctuality of rail services (measured as a 50 % decrease in unreliability and late arrivals); (d) the removal of remaining technical obstacles holding back the rail sector in terms of interoperability and efficiency, in particular by endeavouring to close points which remain open in Technical Specifications for Interoperability (TSIs) due to lack of technological solutions and by ensuring that all relevant systems and solutions developed by the S2R Joint Undertaking are fully interoperable; (e) the reduction of negative externalities linked to railway transport, in particular noise, vibrations, emissions and other environmental impacts. According to Article 17 of Annex 1 "Statutes of the Joint Undertaking", Regulation 642/2014: • Up to 70% of the Union financial contribution to the S2R Joint Undertaking will be implemented through financial support to S2R members, through appropriate measures such as the award of grants following calls for proposals, of which: o up to 40% of the Union financial contribution will be allocated to the founding members other than the Union and their affiliated entities; o up to 30% of the Union financial contribution will be allocated to the associated members and their affiliated entities; • At least 30% of the Union contribution to the S2R JU budget will be implemented by outsourcing tasks through competitive calls for proposals and calls for tenders for non-JU members. Eligibility criteria for associated members: • Any single legal entity (SMEs, large industries, public entities, research organisations, universities etc.), or grouping or consortium of legal entities established in a Member State or in a country associated to the Horizon 2020 Framework Programme; • The undertakings or grouping or consortium of legal entities applying for membership must have the legal capacity to conclude a membership agreement with the S2R JU and ensure clear accountability for the related obligations; • Candidates must demonstrate that they meet the minimum contributions for accession (2.5% of the total budget of the Innovation Programme in which the potential member intends to participate) - CALL FOR EXPRESSIONS OF INTEREST TO BECOME ASSOCIATED MEMBER OF THE SHIFT2RAIL JOINT UNDERTAKING.
Form of financing:	Mainly in the form of grants – Preamble (12) of Regulation 642/2014.
Method of calculating financial assistance:	-
Share of funding - % eligible costs:	• Funding rate for grants will be limited to a maximum of 100% of the total eligible costs for research and innovation actions and a maximum of 70% of the total eligible costs for innovation actions; • The S2R JU financial contribution to each indirect action must not exceed 47.6% of the total costs for carrying out that action, in accordance (CALL FOR EXPRESSIONS OF INTEREST TO BECOME ASSOCIATED MEMBER OF THE SHIFT2RAIL JOINT UNDERTAKING).
Share of EU co-financing:	Approx. 49 % (max. € 450 million)
Conditions for funding:	-

Relation with territorial planning:	-
Example of companies or other entities that already received this funding for investing in last-mile:	-

Person(s) responsible (if any):

Contact details: Christos Economou

Affiliation:

Shift2Rail interim Executive Director

European Commission DG MOVE — Mobility and Transport

Rue Demot 24-28/Demotstraat 24-28 1040 Bruxelles/Brussels Belgium

Phone number: +32 229-58635

E-mail address: info@shift2rail.org

Weblink for source of information:

Shift2Rail, The Rail Joint Undertaking

http://www.shift2rail.org/reference-documents/

Annex F – Comparative matrix programmes/instruments at EU level

1. Comparative matrix programmes/instruments at EU level

No	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications(€)	Eligible Beneficiaries	Eligibility Criteria
1	Shift2Rail	-	research and innovation of the rail system	Research and innovation	Grant	Up to 100% for research and innovation actions and up to 70% for innovation actions	Approx. 49% of the overall programme (max. €450 million)	-	-	S2R founding members, associated members and non-JU members	Indirect actions to acheve the programme objectives, actions geared towards innovative technologies and solutions, and actions measured against specific key performance indicators
2	Connection Europe Facility - CEF	-	Removing bottlenecks, enhancing rail interoperability, bridging missing links, improving crossborder sections,	expenditure for actions resulting from projects, cost of equipment and infrastructure, expenditure related to	Grants, procurement, and financial instruments	Grants can be up to 50% for studies, 40% for works, and 50% for telematic application services. Financial instruments	100%	-	-	One or more MS, international organisations or joint undertakings, public/private undertakings or bodies	Actions contributing to projects of common interest in accordance with Regulation (EU) No 1315/2013 and programme support actions

No	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications(€)	Eligible Beneficiaries	Eligibility Criteria
			ensuring sustainable and efficient transport systems, optimising the integration and interconnection of transport modes and enhancing the interoperability of transport services	environmental studies		are up to 10% of the overall financial envelope of the CEF					
3	European Regional Development Fund	-	Infrastructure in the areas of energy, environment, transport, and ICT	Operational expenditure	Grants, prizes, repayable assistance, financial instruments, or a combination thereof	Fixed by Commission Decision adopting a programme (up to 100% for technical assistance measures implmeented at the initiative/on behalf of the Commission) and established through programmes	100%	-	-	Infrastructure managers, public administrations, public and private undertakings, SMEs, etc.	Activities must contribute to the investment priorities of the programme

No	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications(€)	Eligible Beneficiaries	Eligibility Criteria
						drawn up by MS in accordance with the Partnership Agreement					
4	European Social Fund	-	Promoting employment and supporting labour mobility/ enhancing institutional capacity and efficient public administration	Operational expenditure	Grants, prizes, repayable assistance, financial instruments, or a combination thereof	Co-financing rates vary between 50-85% (can be up to 95% in exceptional cases) of the total project cost and established through programmes drawn up by the MS in accordance with the Partnership Agreement	100%	-	-	a wide variety of organisations (including public administrations, workers' and employers' organisations, NGOs, charities and companies)	Activities must contribute to the investment priorities of the programme

No	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications(€)	Eligible Beneficiaries	Eligibility Criteria
5	Cohesion Fund	-	Environment, TEN-T, technical assistance	Public and private expenditure	Grants, prizes, repayable assistance, financial instruments, or a combination thereof	Fixed by Commission Decision adopting a programme (no higher than 85%) and established through programmes drawn up by MS in accordance with the Partnership Agreement	100%	-	-	wide range of beneficiaries (including infrastructure managers, public administrations, public and private undertakings, SMEs, etc)	Activities must contribute to the investment priorities of the programme
6	Marguerite Fund	-	European greenfield and brownfield infrastructure (including transport)	-	Equity	-	€100 million by EIB (14.1%) and a share of €110 million (15.5%) by the Commission	-	-	-	The project should have minimum 65% commitments in Greenfield and the size of the funded projects should be over 200 million euros
7	TEN-T programme	-	Studies or works which contribute to the TEN-T	Project related expenditure, except for	Grants, interest rate rebates, guarantees,	- studies: 50 % of the eligible cost, irrespective of	100%	714 successful applications	-	Member States, international organisations,	- projects of Common interest - in the field of

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			programme objectives-	VAT	risk capital participation, and financial contributions	the project of common interest concerned; - works: (i) priority projects in the field of transport: — maximum 20 % of the eligible cost, — maximum 30 % of the eligible cost for cross-border sections, (ii) projects in the field of energy: a maximum of 10 % of the eligible cost; (iii) projects in the field of transport other than priority projects: a		(2007-2013)		joint undertakings, public/private undertakings or bodies	transport, eligibility is subject to a commitment by the applicant and MS concerned to make a financial contribution to the project submitted, mobilizing private funds if necessary. - transport related projects on cross border section are eligible if there is a written agreement between the MS concerned, and even 3rd countries where there is one concerned, relating to the completion of the project.

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						maximum of 10 % of the eligible costs - European Rail Traffic Management System (ERTMS): (i) track-side equipment: a maximum of 50 % of the eligible cost of studies , works and equipment - road, air, inland waterway, maritime traffic and coastal traffic management systems: maximum 20 % of the eligible cost of works.					

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8	Marco Polo II	-	Transport and logistics services	All costs necessary to implement the project	Grants	Catalyst actions/motorways of the sea/modal shift/traffic avoidance can be financed up to 35%. Common learning can be financed up to 50%	100%	-	-	Undertakings or consortia established in Member States or participating countries	Catalyst/motorways of the sea/ modal shift/traffic avoidance actions and actions involving the territory at least two MS or the territory of at least on MS and the territory of a close third country
9	EBRD Instruments	-	Priority investments to ensure the development of sustainable transport networks	-	Loans, equity investments, and guarantees	Up to 35% of the total project cost for a greenfield project or 35% of the long-term capitalisation of an established company	-	-	-	Public sector bodies and private companies	Projects which are located in a country where the EBRD works; have good prospects of being profitable; have significant equity contributions in cash or in kind from the project sponsor; benefit the local economy; and satisfy certain environmental standards
10	European Investment Bank LGTT	-	Core transport infrastructure	Senior debt	Guarantees	Max. 10% of senior debt (20% in exceptional instances)	50% of the overall instrument (€500 million)	-	-	Debt providers	Projects of common interest in the field of transport in the framework of TEN-T/for which financial viability is based in whole or in part on revenues, tolls, or other user-charges based

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											income
11	European Investment Bank SFF	-	Transport infrastructure	-	A combination of senior loans and guarantees; subordinated loans and guarantees; mezzanine finance; and project-related derivatives	Less than 50% of the project cost (up to 75% in exceptional circumstances)	-	-	-	-	Priority projects using certain instruments with a higher risk profile

Comparative matrix programmes/instruments at Member State level

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1	AT (R)	Beihilfe des Bundes für die Erbringung von Schienengüterverkehrsleistungen in bestimmten Produktionsformen in Österreich (Federal Aid for the Provision of Rail Freight Services)	-	Provision of rail freight services in the forms of production of single wagon traffic, unaccompanied combined transport or the rolling road	-	Non-repayable grant	Up to 100%	-	-	-	Any railway company that provides rail freight services in Austria or other companies that seeks to perform such services in Austria	-
2	AT (HR)	Innovationsförderprogramm em Kombinierter Güterverkehr (Innovation Programme for Combined Freight Transport)	-	Investment in systems, mobile devices, and equipment that are required specifically for the transport or handling of goods in combined road-rail-ship	Physical investment, feasibility analysis, and targeted training	Grant	50% (30% maximum of investment cost)	-	20	-	Physical and legal persons and of associations of civil and commercial law, who have a branch in Austria, also legally independent companies that are owned by a local authority	Applications from railway operators are only eligible if they have a highly innovative component

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3	AT (LR)	Intelligent Transport Systems and Services plus (IV2Splus) - Transnational	-	Research & Development	-	Non-repayable grant	10-90%	-	26 applied, 14 granted	2.3 million	Austrian resident research organizations and companies only.	The proposed transnational project must address on of the IV2Splus programme line themes or relate to a complementary announced topic for a specific proposal submission period
4	AT (LR)	Intelligent Transport Systems and Services Plus (IV2Splus) – National	-	Research & Development	Labor cost, equipment, training, and external expertise	Grant	Funding rates account for 75% - 25%, Basic studies are financed up to 100%	-	430 applied, 200 granted	47 million	Companies, Consultancy and other private service providers, higher education instutions, research centers, non-profit research organizations, non-profit technology and innovation centers (Austrian based)	-

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5	AT (LR)	Mobilitat der Zukunft (Future of Mobility)	-	Research & Development	-	Grant	R&D Services: 100% Feasibility Studies: 40-80% Cooperative R&D Projects: 35-80% Flagship Projects: 35-80%	-	121 (September 2014)	21 million	Mainly for Austrian organizations, but foreign organizations may also apply though they will receive less funding (maximum 20% of eligible costs)	-
6	BG (R)	Operational Programme “Transport”	211 million	Extending the network of terminals for mixed transport; Development of subway city railway that connects key transport centers from national importance with other types of transport	-	Grant	Up to 100%	80%	15	-	National Railway Infrastructure Company; "Metropolitan JSC.; National Road Infrastructure Fund, Agency for Exploration and Maintenance of Danube River	-

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7	BG (R)	Operational Programme "Transport and Transport Infrastructure"	-	Developing and rehabilitating comprehensive, high quality and interoperable railway systems, and promoting noise-reduction measures; building of effective connections (road and railway) to the seaports and important logistic centers; building of TEN-T infrastructure	-	Grant	Up to 100%	85%	-	-	-	-

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8	BG (R)	Nordic Investment Bank Long Term Loan	-	investments in infrastructure, such as energy and transport, research and development, the improvement of manufacturing processes, internationalization of businesses and investments by small and medium-sized enterprises. NIB also finances investments in preventing and treating pollution.	-	Loans and guarantees	Generally not exceed 50%	-	-	-	Private and public companies, governments, municipalities and financial institutions	All projects financed by NIB should improve competitiveness and/or the environment. Furthermore, outside the membership area, projects financed by NIB should be of mutual interest to the country of the borrower and the member countries.

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9	HR (R)	Operational Programme Competitiveness and Cohesion (OPCC)	-	Construction, modernization and rehabilitation of railway lines; purchase and modernization of passenger rolling stock; implementation of European safety solutions; implementation of common European standards in the field of GSM-R, ERTMS, ETCS, etc.	-	Non-repayable grant	-	100%	-	-	Croatian Railway Infrastructure, HŽ INFRASTRUKTURA d.o.o., railway operators, owners of railway stations, and local authorities (for urban transport integration projects)	-

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10	HR (R)	Operational Programme Transport	-	New construction and upgrading transport infrastructures	Double tracking, increasing speed, installing ERTMS ECTS and centralized traffic control equipment, installing and upgrading telecommunications, power supply, drainage system, and automatic barrier level crossings	Grant	-	85% (ERDF)	-	-	Public bodies and authorities in the transport sector	Applications from railway operators are only eligible if they have a highly innovative component

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11	CZ (R)	Státní Fond Dopravní Infrastruktury / The State Fund for Transport Infrastructure	-	Development, construction, maintenance and modernization of transport infrastructure in the country as well as research and expert projects supporting the development and innovation in the field	Finance the construction, reconstruction and modernization of transport infrastructure (including national and regional railways); contributions to research and design work, study, and expert activities aimed at constructions of nationwide and regional railways	Grant	Up to 75% (100% for organizations and institutions established by the state whose budget is tied from the state and/or SFDI budget)	5,8 mld. CZK (2007-2020) (The exact volume of share for one year cannot be calculated)	-	-	A state body, a state contributory organisation, or a state authority which manages assets of the transport infrastructure, regions, the persons to whom the state assigned responsibility to carry out some of its competences as the owner of that property by special law, and other persons carrying out construction, modernisation, repairs, and maintenance	-

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12	CZ (HR)	Operational Programme “Transport”	119.4 million	Multimodal transport systems	-	Grant	Up to 100%	85%	51 (priority 6)	110.7 million (priority 6)	Owners and managers of the infrastructure concerned, owners of railway vehicles and railway transport operators, owners of reloading mechanisms multimodal transport and any other relevant entities	-
13	DK (LR)	Green Investment Plan	-	Green transport infrastructure	-	-	-	-	-	-	-	-
14	DK (R)	Nordic Investment Bank Long Term Loan	-	Investments in infrastructure, such as energy and transport, research and development, the improvement of manufacturing processes, internationaliz	-	Loans and guarantees	Generally not exceed 50%	-	-	-	Private and public companies, governments, municipalities and financial institutions	All projects financed by NIB should improve competitivene ss and/or the environment. Furthermore, outside the membership area, projects financed by

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				ation of businesses and investments by small and medium-sized enterprises. NIB also finances investments in preventing and treating pollution.								NIB should be of mutual interest to the country of the borrower and the member countries.
15	ET (R)	Nordic Investment Bank Long Term Loan	-	investments in infrastructure, such as energy and transport, research and development, the improvement of manufacturing processes, internationalization of businesses and investments by small and medium-sized enterprises. NIB also finances investments in preventing and treating	-	Loans and guarantees	Generally not exceed 50%	-	-	-	Private and public companies, governments, municipalities and financial institutions	All projects financed by NIB should improve competitiveness and/or the environment. Furthermore, outside the membership area, projects financed by NIB should be of mutual interest to the country of the borrower and the member countries.

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				pollution.								
16	FI (LR)	Nothern Dimension Partnership on Transport and Logistic Support Fund	-	Technical assistance, assistance in project development and preparation, and assistance to improve efficiency of project implementation	Except for VAT paid by NDPTL Member States and public sector bodies	Grant	Up to 50%	-	-	-	Only written applications submitted by legal persons of private or public law legally constituted and registered in an NDPTL Member State are eligible for the funding from the NDPTL Support Fund	-
17	FI (R)	Nordic Investment Bank Long Term Loan	-	Investments in infrastructure, such as energy and transport, research and development, the improvement of manufacturing processes, internationalization of businesses and investments by small and	-	Loans and guarantees	Generally not exceed 50%	-	-	-	Private and public companies, governments, municipalities and financial institutions	All projects financed by NIB should improve competitiveness and/or the environment. Furthermore, outside the membership area, projects financed by NIB should be of mutual interest to the country of the

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				medium-sized enterprises. NIB also finances investments in preventing and treating pollution.								borrower and the member countries.
18	FR (LR)	Inter-ministerial Land Transport Research and Innovation Programme (Predit 4)	-	Research & innovation	Various project-related cost	Credit incentive	Between 20% and 80%, depending on the nature of the action and the status of the funding beneficiary	-	-	-	Private companies, state and local public entities	The projects must contribute to developments in transport technology, transport-related services, knowledge and tools for public policy; Co-funding of projects by industry, local authorities, other ministries, and from European institutions; the actions concerning infrastructure are in principle eligible only from the point

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												of view of the exploitation and of the service
19	FR (R)	Programme d'investissements d'avenir (PIA 1 and PIA 2)	-	Research and innovation, investment in infrastructure	Various project-related cost	Credit; direct grant; guarantee; and repayable advances	-	-	-	-	Private companies, state and local public entities	The project must come within the thematic priorities defined by the programme and each project must be co-financed (in particular by private companies and banks)
20	DE (R)	Infrastrukturbeschleunigungsprogramm II (Infrastructure Acceleration Programme II)	-	-	-	-	-	-	-	-	-	-

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21	DE (HR)	Förderung von Umschlaganlagen des Kombinierten Verkehrs nichtbundeseigener Unternehmen (Funding for Combined Transportation Terminals for Non-Federal Undertakings)	-	New construction, expansion, and extension of combined transportation terminals	Land acquisition, settlement of properties, purchase of handling equipment, and construction	Non-repayable grant	Up to 80%	-	-	-	Private legal companies	A terminal shall be deemed eligible for funding if the net present value, calculated on the basis of the net present value method (Annex 3, para. 7) and taking a rate of imputed interest into account, is negative without the funding. No funding shall be provided if the net present value with funding is not at least zero.
22	DE (R)	Verkehrsprojecte Deutsche Einheit (United Germany Transportation Project)	-	-	-	-	-	-	-	-	-	-

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23	GR (R)	Operational Programme 'Improvement of Accessibility'	-	Direct aid to investments in companies to create sustainable jobs; infrastuctures linked notably to research and innovation, telecommunications, environment, energy, and transport.	Energy efficiency, use of renewable energy, developing rail transport, supporting intermodality, strengthening public transport	Grant	Up to 100%	75%	-	-	Public and private firms	-
24	GR (LR)	Operational Programme Transport 'Infrastructure, Environment, and Sustainable Development'	-	Construction of numerous road and railway trajectories; reduction of pollution and greenhouse effects; and safety on road	-	Grant	Up to 100%	85%	-	-	-	-
25	HU (HR)	Transport Operational Programme	178 million	Construction and modernisation of approach of factory sidings connecting to the main transport	Expenses for construction/rehabilitation, land procurement, and land works	Direct grant	Up to 100%	85% (15% from state budget)	-	-	Companies and local governments	Contribute to the social-economic objectives of the TOP, as well as the given priority of linking up

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				network; projects that increase the intermodality of national and regional transport; improve transport accessibility in economical and environmentally friendly ways (i.e. cause lower greenhouse gas emission and less energy consumption).								the modes of transport; have objectives that are definite, measurable, and achievable; be cost-effective; be sustainable from a financial and organizational point of view; contribute to the enforcement of sustainable development, equal opportunities, and the principle of non-discrimination; demonstrate the existence of all necessary pre-conditions for their successful implementation.
26	HU (R)	Economic Development	910 million	Construction of last mile	Expenses for infrastructure	Direct grant	Up to 100%	Unknown	-	-	Companies and local	Contribute to the social-

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		Operational Programme		infrastructure	construction, consultancy, and technical assistance.						governments	economic objectives of the GOP, as well as the given priority of linking up the modes of transport; have objectives that are definite, measurable, and achievable; be cost-effective; be sustainable from a financial and organizational point of view; demonstrate the existence of all necessary pre-conditions for their successful implementation.

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27	IE (LR)	Irish Infrastructure Fund	-	Transport related infrastructure includes privatized motorways, ports, airports, and rail	-	Loan	-	-	-	-	These can include assets currently owned by the government and commercial state enterprises, privately owned infrastructure assets and new investment projects.	-
28	IE (R)	Adriatic IPA	58.76 million		-	Grant	Up to 100%	83%	-	-	Public and public equivalent authorities (ports and airport authorities)	-
29	IT (HR)	Operational Programme “Network and Mobility”	-	Development of nodal infrastructures for freight intermodality	-	Direct grant	75%	77.7%	98	-	-	-

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30	LV (LR)	Nothern Dimension Partnership on Transport and Logistic Support Fund	-	Technical assistance, assistance in project development and preparation, and assistance to improve efficiency of project implementation	Except for VAT paid by NDPTL Member States and public sector bodies	Grant	Up to 50%	-	-	-	Only written applications submitted by legal persons of private or public law legally constituted and registered in an NDPTL Member State are eligible for the funding from the NDPTL Support Fund	-
31	LV (R)	Nordic Investment Bank Long Term Loan	-	Investments in infrastructure, such as energy and transport, research and development, the improvement of manufacturing processes, internationalization of businesses and investments by small and medium-sized enterprises. NIB also	-	Loans and guarantees	Generally not exceed 50%	-	-	-	Private and public companies, governments, municipalities and financial institutions	All projects financed by NIB should improve competitiveness and/or the environment. Furthermore, outside the membership area, projects financed by NIB should be of mutual interest to the country of the borrower and the member countries.

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				finances investments in preventing and treating pollution.								
32	LT (HR)	Operational Programme for EU Structural Funds Investments for 2014-2020	-	Construction of multimodal terminals; and improvement of interoperability between sea and rail transport by modernizing railway junctions	-	Grant	Up to 100%	85%	-	-	-	-
33	LT (R)	Northern Dimension Partnership on Transportation and Logistics Support Fund	-	Technical assistance, assistance in project development and preparation, and assistance to improve efficiency of project implementatio	Except for VAT paid by NDPTL Member States and public sector bodies	Grant	Up to 50%	-	7	1,645,429	Only written applications submitted by legal persons of private or public law legally constituted and registered in an NDPTL Member State are eligible for	-

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				n							the funding from the NDPTL Support Fund	
34	LT (R)	Nordic Investment Bank Long Term Loan	-	Investments in infrastructure, such as energy and transport, research and development, the improvement of manufacturing processes, internationalization of businesses and investments by small and medium-sized enterprises. NIB also finances investments in preventing and treating pollution.	-	Loans and guarantees	Generally not exceed 50%	-	2	250 million	Private and public companies, governments, municipalities and financial institutions	All projects financed by NIB should improve competitiveness and/or the environment. Furthermore, outside the membership area, projects financed by NIB should be of mutual interest to the country of the borrower and the member countries.

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35	NL (LR)	Borgstelling MKB	-	Technological innovation, including infrastructure	-	Guarantee	Government guarantees 60% of the loan (a credit of up to 1.5 million)	-	-	-	[banks lending money to] SMEs	-
36	NL (LR)	Garantie Ondernemings financiering	-	-	-	Guarantee	50% of the amount lent (maximum 75 million Euro)	-	-	-	[banks lending money to] (medium) Large companies with substantial operations in the Netherlands	The bank lending and the bank guarantee facility under the GO funding are situated within the lower limit of € 1.5 million and a maximum of € 75 million
37	NL (HR)	Hoogfrequent Spoorvervoer	-	Investment in infrastructure	Various project-related costs	Grant	-	-	-	-	Prorail, NS (Nederlandse Sporwegen) and KNW Spoorgoedern vervoer, together with the Ministry of infrastructure are in charge of the implementatio n of the programme	-

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38	NL (HR)	Infrastructuur fonds	-	Investment in infrastructure, including rail	Various project-related costs	Grant	Up to 100%	-	-	-	Prorail	-

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39	NL (LR)	Innovatiefonds MKB+	-	Investment in projects in which knowledge is converted into a final product, from knowledge to checkout	Various project-related costs	Credit	-	-	-	-	SMEs	Innovation projects with excellent prospects (products, processes and services) to which substantial technical and consequent financial risks are attached

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40	NL (HR)	BDU 'Brede Doeluitkering Verkeer en Vervoer'	Approx. 25%	Infrastructure investment and maintenance (including investments in the last-mile infrastructure)	Various project-related costs	Grant	Up to 100% (for projects below a certain threshold (€ 225 million for the Amsterdam and Rotterdam/Den Haag urban regional authorities, € 112.5 million in the case of the other provincial authorities) / less than 100% for projects above these thresholds	-	-	-	Provincial and urban regional authorities	BDU contributes to regional and local mobility projects
41	PL (R)	Nothern Dimension Partnership on Transport and Logistic Support Fund	-	Technical assistance, assistance in project development and preparation, and assistance to improve efficiency of project	Except for VAT paid by NDPTL Member States and public sector bodies	Grant	Up to 50%	-	-	-	Only written applications submitted by legal persons of private or public law legally constituted and registered in an NDPTL Member State	-

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				implementatio n							are eligible for the funding from the NDPTL Support Fund	
42	PL (R)	Nordic Investment Bank Long Term Loan	-	Investments in infrastructure, such as energy and transport, research and development, the improvement of manufacturing processes, internationaliz ation of businesses and investments by small and medium-sized enterprises. NIB also finances investments in preventing and treating pollution.	-	Loans and guarantees	Generally not exceed 50%	-	-	-	Private and public companies, governments, municipalities and financial institutions	All projects financed by NIB should improve competitivene ss and/or the environment. Furthermore, outside the membership area, projects financed by NIB should be of mutual interest to the country of the borrower and the member countries.

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
43	PL (LR)	Operational Programme 'Zachodniopomorskie'	259.7 million	Modernization of regional railways; constuction and reconstruction of port infrastructure	-	Grant	Up to 100%	85%	-		-	-
44	PL (LR)	Operational Programme 'Development of Eastern Poland'	-	Reconstruction of railways	-	Grant	Up to 100%	85%	-		-	-
45	PL (HR)	Operational Programme 'Infrastructure and Environment'	12.06 billion	Projects that increase the intermodality of national and regional transport; construction and modernization of factory sidings connecting tot the main transport network; and improve transport accessibility in ecofriendly ways	-	Direct grant	Up to 100%	75%	210		Companies and local governments	-

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
46	PL (HR)	Operational Programme 'Infrastructure and Environment'	-	Construction and modernization of railway infrastructure	-	Direct grant	Up to 100%	85%	-		-	-

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
47	PL (HR)	Inwestycje Polskie (Polish Investment Programme)	-	Railway networks, municipal projects including transport infrastructure, and industrial networks	-	PIR – equity, mezzanine instruments; BGK - loans, bond guarantees, and guarantees	BGK - < PLN 2 billion; PIR – PLN 50-750 mln, depending on the project (minority interest of up to 49%)	-	100 (until December 2014)	Approx. 5.87 billion (23.5 billion PLN until December 2014)	-	The projects financed within the Programme must be economically viable and contribute to the development of existing or new infrastructure in the territory of Poland.

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
48	RO (HR)	Operational Programme Transport	5.5 billion	Modernization and development of railway infrastructure, river and maritime ports, promote intermodal transport, minimize adverse effects of transport on the environment	Expenses for land procurement, arrangements of land, constructions and facilities, building site management, approvals, agreements, certificates, consultancy, technical assistance, commissions, taxes, fees, publicity, etc.	Grant	Up to 100%	85% (15% from state budget)	-	-	Mainly national public authorities managing transport infrastructures (including rail); other public or private bodies or firms responsible for initiating and implementing the operations	Contribute to the objectives of the TOP, corresponding to each priority axis or major area of intervention; comply with the national legislation in the field of public procurement; comply relevant EU and national legislation; the project does not benefit from financial support from other public funds; the beneficiary has the capacity to bring its own financial contribution to the project.

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
49	RO (R)	Regional Operational Programme	1.58 billion	Rehabilitation and modernization of the county roads and urban streets network, and development of sustainable business support structures of regional and local importance	Expenses for land procurement, land works with regard to environmental protection, assurance of utilities for the objective, land studies, designing, engineering, management of the execution contract, constructions, facilities, etc.	Grant	Up to 100%	85% (15% from state budget)	-	-	Regional and local authorities and private entrepreneurs	Applicant must prove the property of the land; the project has a feasibility study; applicant must prove the co-financing capacity; proposed activities must not have been financed from public funds in the last 5 years; financial costs of the project respect the financial limits provided for the respective type of the project; payments done by the beneficiary to the contractor must not exceed 30 June 2015; project is in compliance with the

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
												priority axis eligible activities; proposed projects must respect the plans for spatial planning and urbanism plan requirements; and the applicant must prove the administrative capacity of the project implementation
50	SK (R)	Nordic Investment Bank Long Term Loan	-	Investments in infrastructure, such as energy and transport, research and development, the improvement of manufacturing processes, internationalization of	-	Loans and guarantees	Generally not exceed 50%	-	-	-	Private and public companies, governments, municipalities and financial institutions	All projects financed by NIB should improve competitiveness and/or the environment. Furthermore, outside the membership area, projects financed by NIB should be

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
				businesses and investments by small and medium-sized enterprises. NIB also finances investments in preventing and treating pollution.								of mutual interest to the country of the borrower and the member countries.
51	SK (HR)	Operational Programme "Integrated Infrastructure"	-	Modernizing railway infrastructure	-	Grant	Up to 100%	85%	-	-	-	-

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
52	SK (LR)	Operational Programme "Transport"	-	Construction and modernization of different fields of transport infrastructure	-	Grant	Up to 100%	85%	12	-	-	-

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
53	SI (HR)	Operational Programme “Development of Environment and Transport Infrastructure ”	813 million	Constructing new railway lines and modernizing lines for freight transport to improve the volume of transported cargo per year	Construction of new multimodal terminal, extension of operative quays, construction of manipulation rails, marshalling, construction of direct link to the central railway station and appropriate motorway links will be set in motion, extension of existing terminals	Grant	Up to 100%	85%	11 (5 railway infrastructure, 5 projects in reserve, and 1 port infrastructure)	-	Public law entities involved in the implementatio n of the OP; private law entities, beneficiaries of the programme whose technical assistance projects were chosen through a public tender	-
54	SI (LR)	Operational Programme for the Implementatio n of the EU Cohesion Policy	-	Upgrading the railway infrastructure and constructing the missing motorway sections along the Trans-European	-	Grant	Up to 100%	80%	-	-	-	-

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
				Transport (TEN-T) Network								
55	ES (LR)	Financiación del Convenio con el Cabildo Insular de Gran Canaria en materia de ferrocarril (Financing Agreement with the Grand Canary Island Council, on Rail Infrastructure)	-	Conducting studies on this topic and land acquisition or expropriation	-	Grant	-	-	-	-	Cabildo Insular de Gran Canaria	-
56	ES (R)	2013 Estrategia Logistica de Espana (Spain Logistic Strategy 2013)	100 million	-	-	Direct public funding	-	-	-	-	-	-

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
57	SE (LR)	Nothern Dimension Partnership on Transport and Logistic Support Fund	-	Technical assistance, assistance in project development and preparation, and assistance to improve efficiency of project implementation	Except for VAT paid by NDPTL Member States and public sector bodies	Grant	Up to 50%	-	-	-	Only written applications submitted by legal persons of private or public law legally constituted and registered in an NDPTL Member State are eligible for the funding from the NDPTL Support Fund	-
58	SE (R)	Nordic Investment Bank Long Term Loan	-	Investments in infrastructure, such as energy and transport, research and development, the improvement of manufacturing processes, internationalization of businesses and investments by small and medium-sized enterprises. NIB also	-	Loans and guarantees	Generally not exceed 50%	-	-	-	Private and public companies, governments, municipalities and financial institutions	All projects financed by NIB should improve competitiveness and/or the environment. Furthermore, outside the membership area, projects financed by NIB should be of mutual interest to the country of the borrower and the member countries.

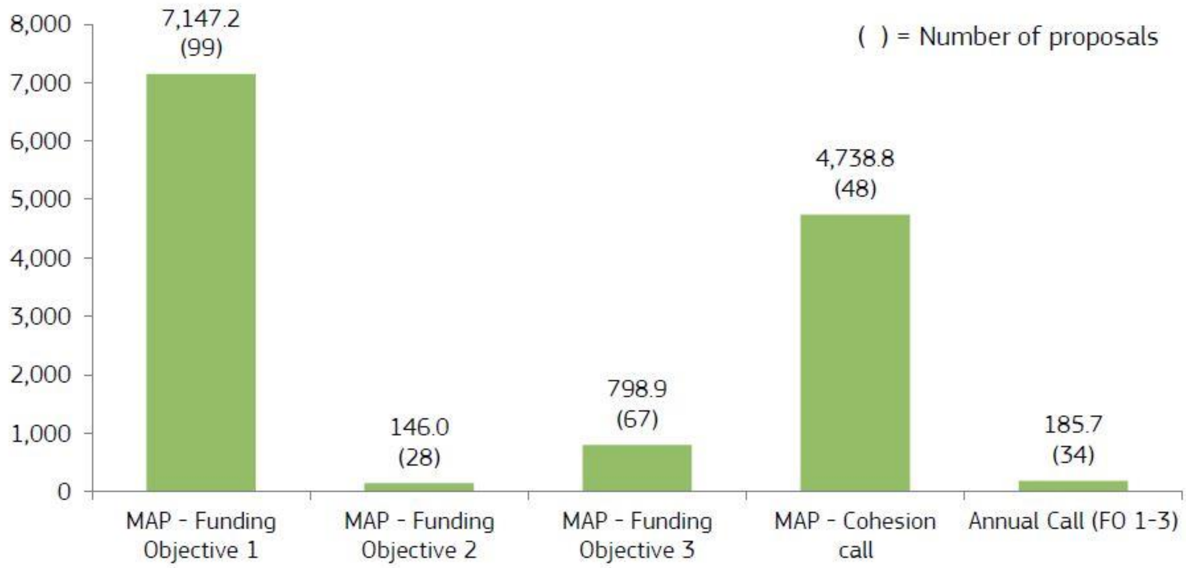
No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
				finances investments in preventing and treating pollution.								
59	UK (LR)	Growing Places Fund	-	Capital investment and new local fund management	-	Loan, revolving fund	Up to 100%	-	305 (June 2013)	Approx. 903.34 million (£652 million June 2013)	Local authorities and local enterprise partnerships	-
60	UK (LR)	Local Sustainable Transport Fund	-	Resource and capital	-	-	Up to 100%	-	96 accepted and 19 refused (2011-2015)	Approx. 746.79 million (£539 million 2011-2015)	Any English local transport authority outside London	-
61	UK (R)	Modal Shift Revenue Support	-	Modal shift from road transport to rail or inland waterway	Operating cost associated with running rail or inland water freight transport instead of road	Grant	Up to 100%	-	59 (2015-2016)	Approx. 27.71 million (approx. £ 20 million 2015-2016)	Any company can apply for support if it is acting as the operator or contractor of an eligible rail service.	all traffic carried in standard intermodal units (containers, swap bodies or piggyback trailers) on railway infrastructure

No	Country	Programme Name	Funding for Last Mile (€)	Type of Investments Covered	Type of Eligible Costs	Form of Financing	Share of Eligible Cost	Share of EU Funding	Usage – Number of Applications	Usage – Volume of Applications (€)	Eligible Beneficiaries	Eligibility Criteria
62	UK (HR)	Freight Facilities Grant	-	Rail and waterway infrastructures , loading and unloading equipments, building and storage, services, access roads, security fencing, environmental protection, rights of way, and design and project management	-	Grant	Up to 50%	-	-	-	EU companies operating in UK (owners/consignor of goods, transport operators)	-

Annex G – Focus on CEF Programmes

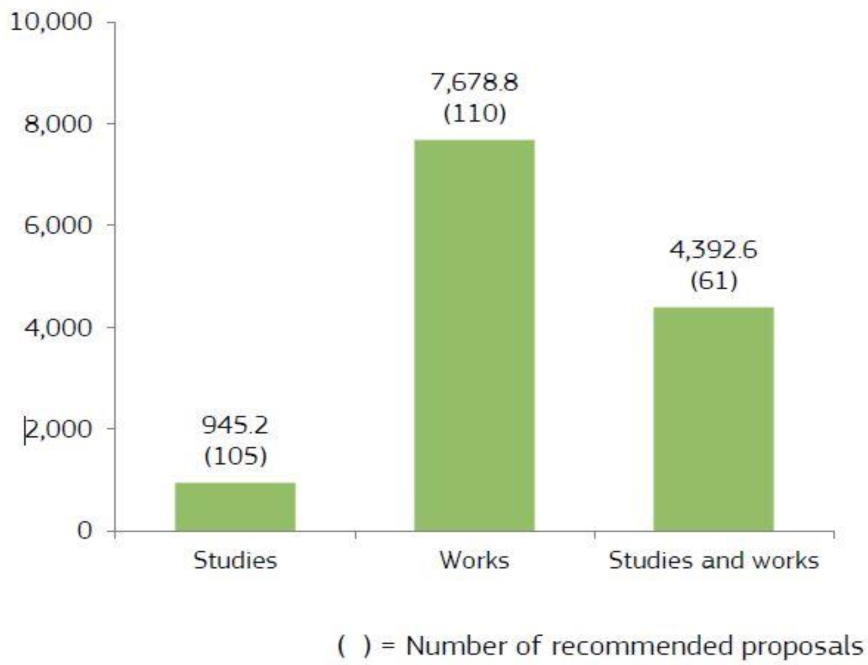
For the Multi-Annual calls, 242 proposals representing funding of €12.8 billion were recommended for funding, including 48 proposals amounting to more than €4.7 billion under the Cohesion Fund allocation. For the Annual call, 34 proposals were recommended for funding, representing funding of €185.7 million.

Figure 86 - Recommended CEF funding by call (€ million)



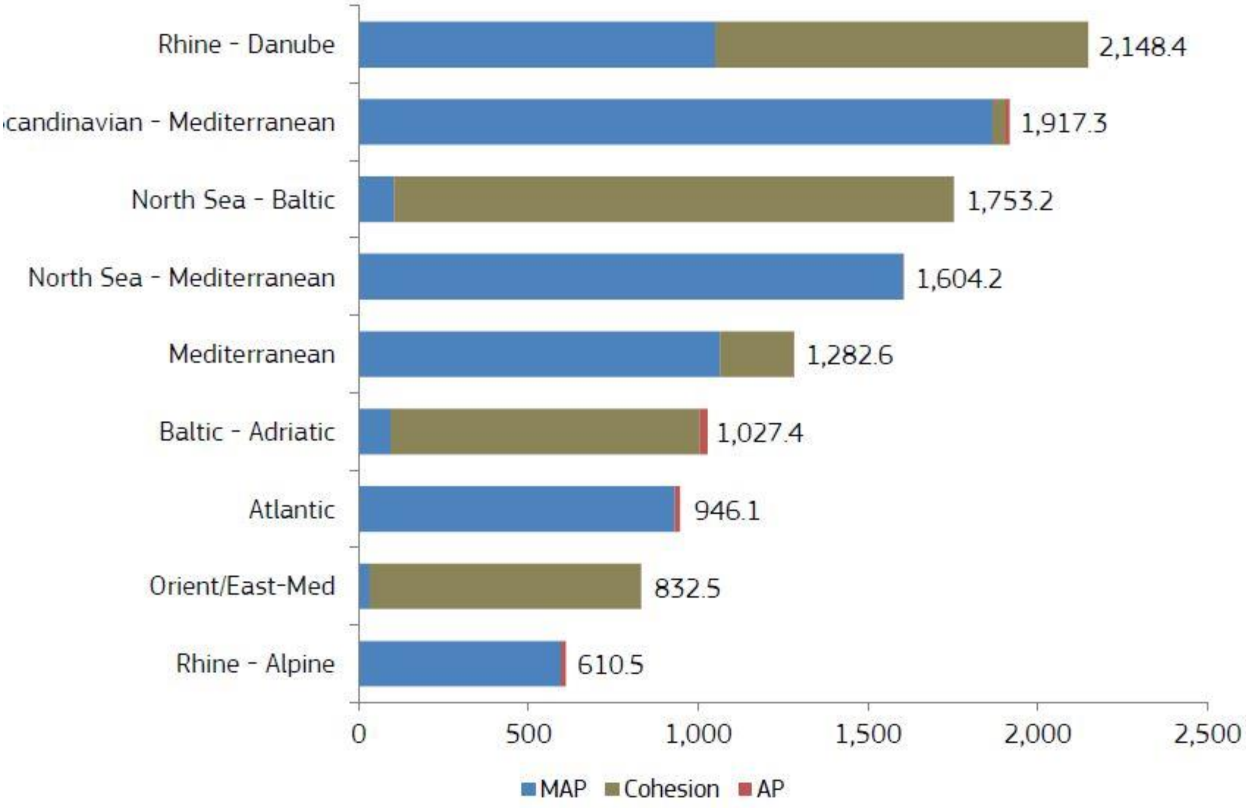
Selected proposals covered all project types, with 105 proposals for studies, 110 proposals for works and 61 proposals combining the two types.

Figure 87 - Recommended CEF funding by project type (€ million)



As foreseen by the CEF programme priority-setting, the vast majority of recommended funding (more than €12 billion) is concentrated on the Core Network Corridors.

Figure 88 - Recommended CEF funding (€ million) per Core Network Corridors



Despite the emphasis on projects located on the Core Network Corridors, the allocated funding was evenly spread throughout the priorities of the calls.

Figure 89 - Funding Objective 1, Recommended CEF funding by priority (€ million)

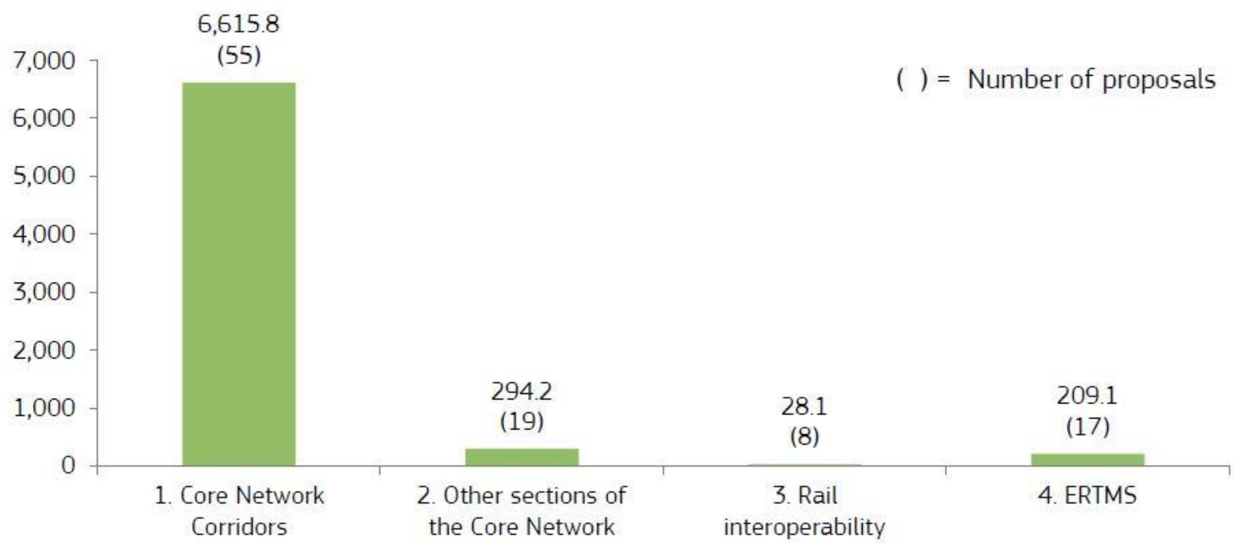


Figure 90 - Funding objective 2, Recommended CEF funding by priority (€ million)

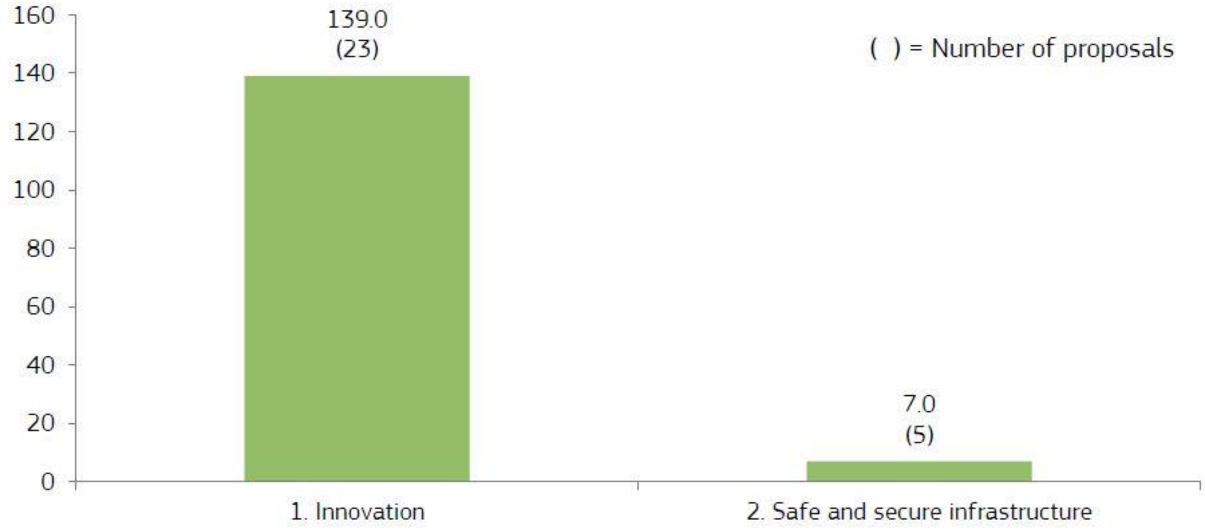


Figure 91 - Funding objective 3, Recommended CEF funding by priority (€ million)

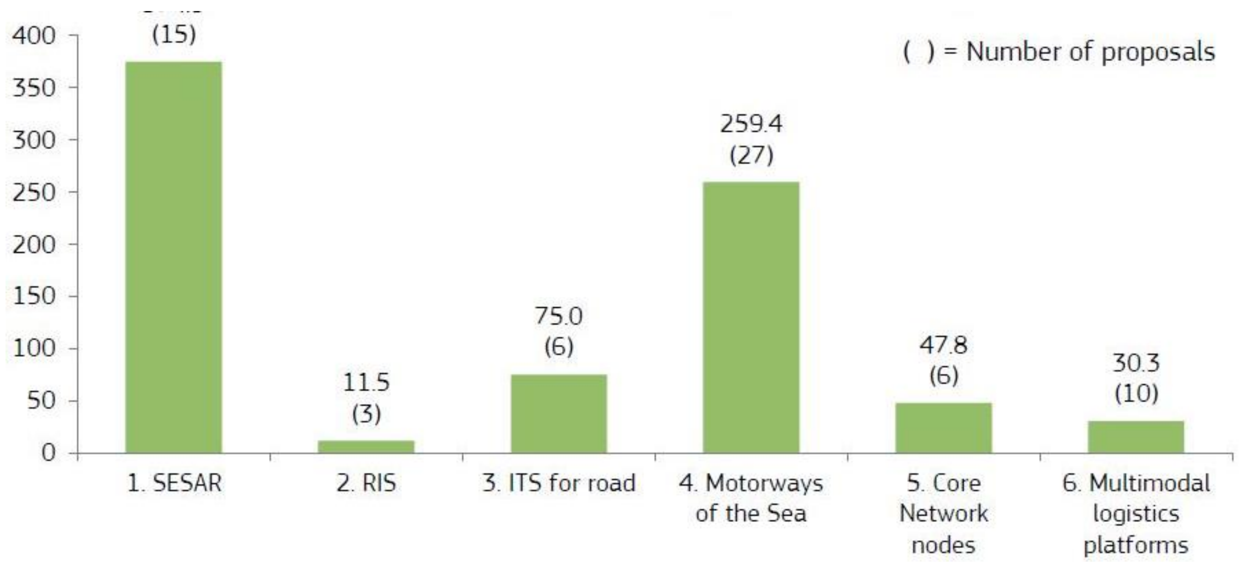


Figure 92 - Cohesion call, Recommended CEF funding by priority (€ million)

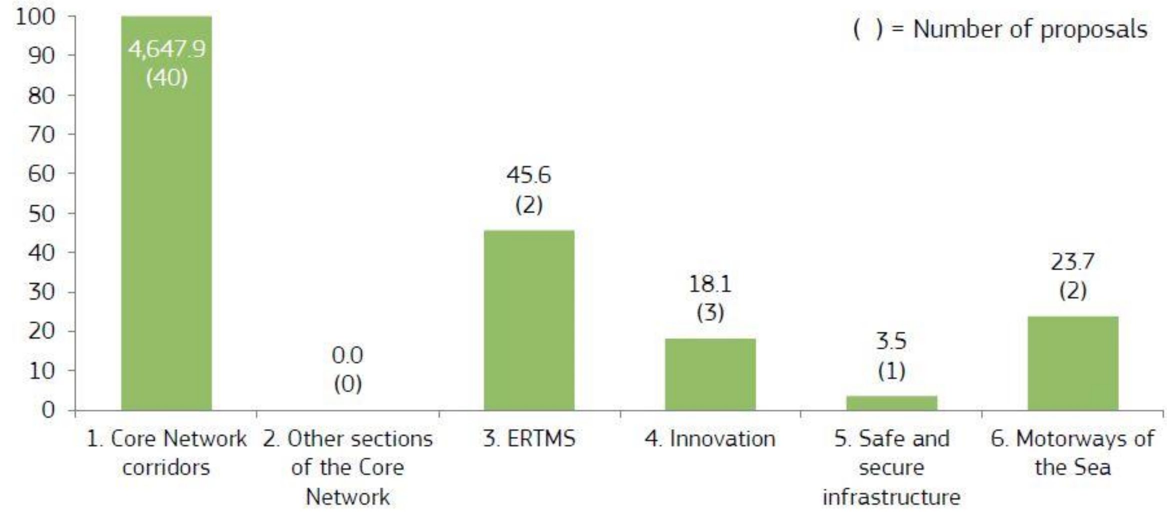
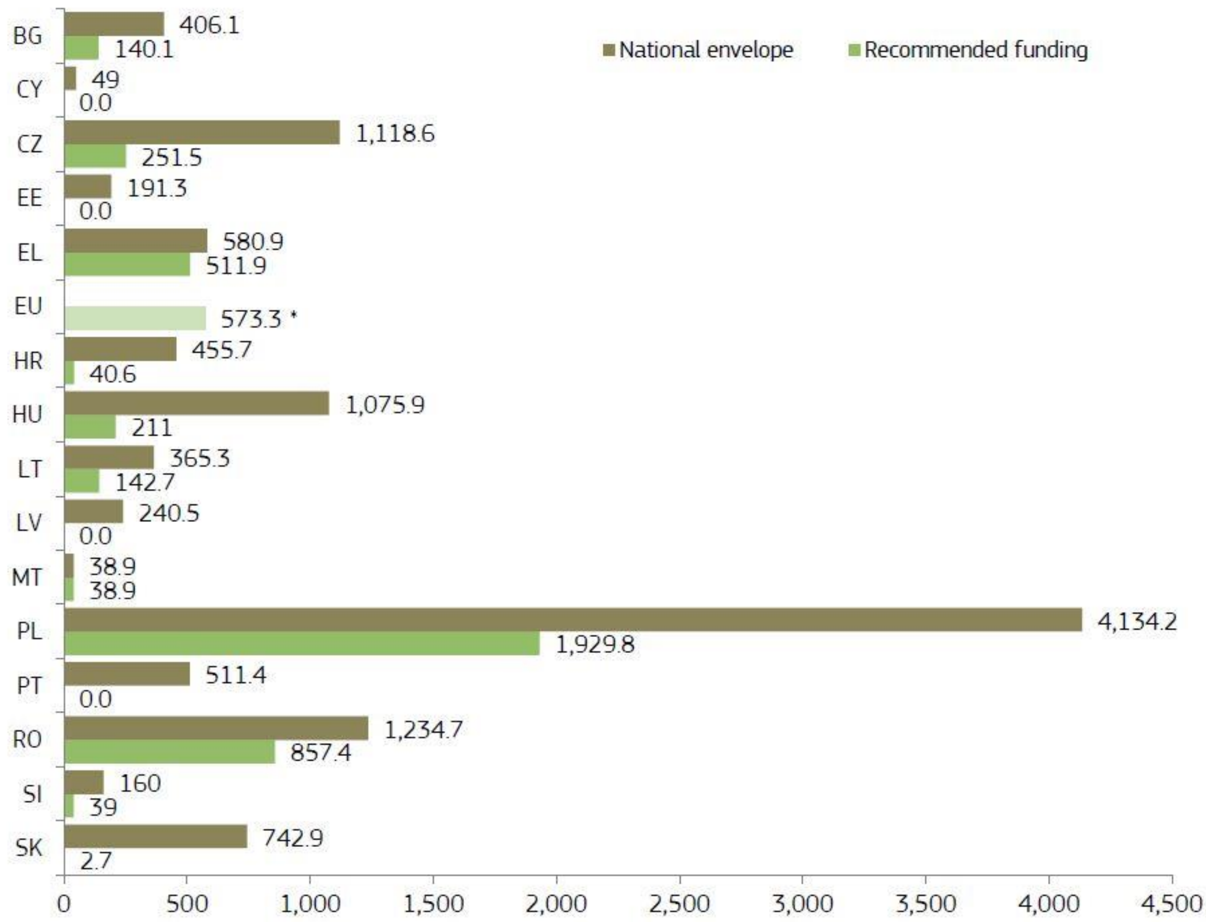


Figure 93 - Cohesion call, National envelopes vs recommended CEF funding (€ million)

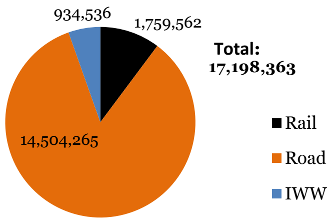


Annex H – Transport market overview in European countries (country charts)

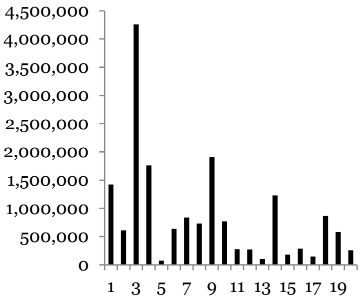
Country-based analysis: Total (EU-28+Norway and Switzerland)

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

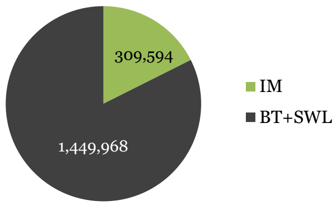
GT03: Ores, quarrying products

GT09: Other mineral products

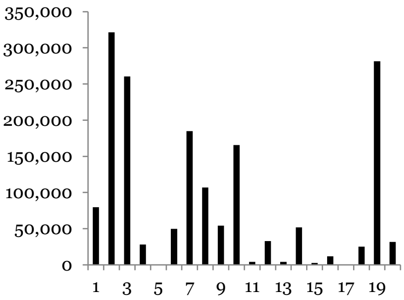
GT04: Food products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

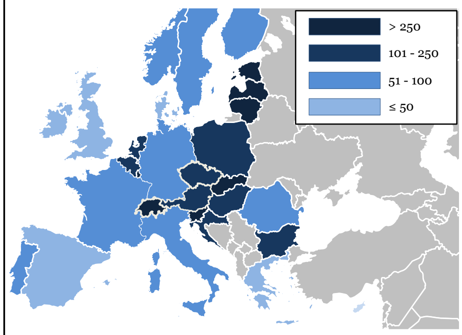
GT02: Coal, natural gas/oil

GT19: Unidentifiable goods

GT03: Ores, quarrying products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

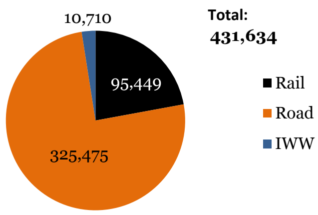


Private sidings:	15,613
Station with public sidings:	5,610
Intermodal terminals:	730
Railports:	189
Track length [km]:	231,141
Total access points/1000 km:	**96**

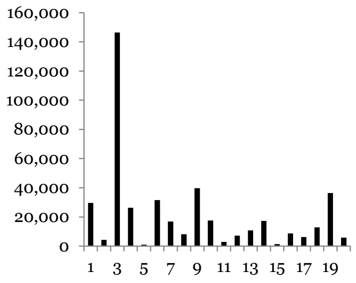
Country-based analysis: Austria

Total freight market

Freight transport volumes 2013 (1,000 t)



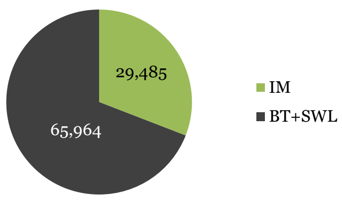
Total transport volumes according NST2007 commodities 2013 (1,000 t)



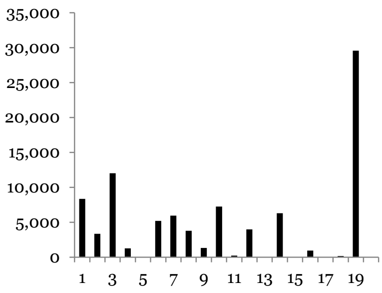
Top 3 commodities:
GT03: Ores, quarrying products
GT09: Other mineral products
GT19: Unidentifiable goods

Rail freight market

Rail: type of consignment 2013 (1,000 t)



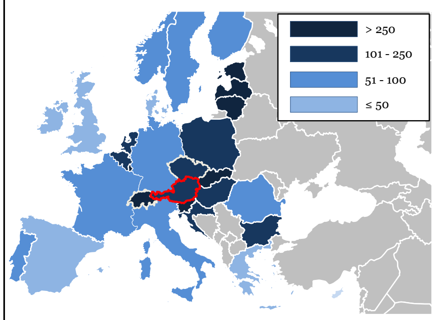
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT19: Unidentifiable goods
GT03: Ores, quarrying products
GT01: Agriculture, forestry

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

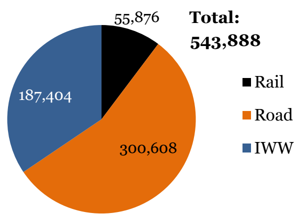


Private sidings:	716
Station with public sidings:	107
Intermodal terminals:	21
Railports:	7
Track length [km]:	5,566
Total access points/1,000 km:	**153**

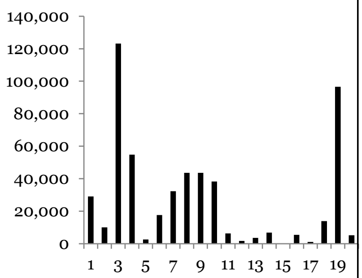
Country-based analysis: Belgium

Total freight market

Freight transport volumes 2013 (1,000 t)



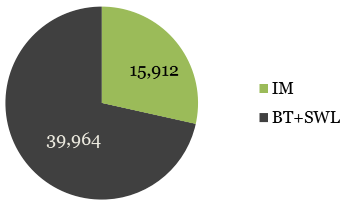
Total transport volumes according NST2007 commodities 2013 (1,000 t)



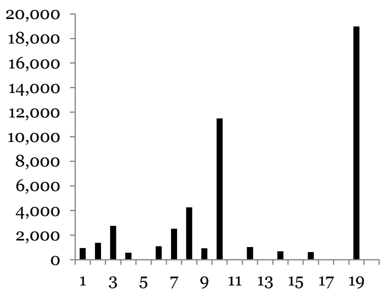
Top 3 commodities:
GT03: Ores, quarrying products
GT19: Unidentifiable goods
GT04: Food products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



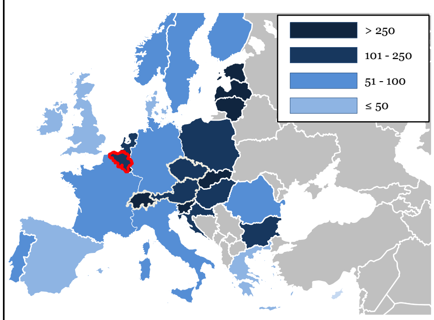
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT19: Unidentifiable goods
GT10: Metal products
GT08: Chemical products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

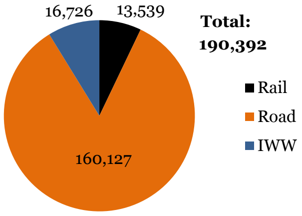


Private sidings:	484
Station with public sidings:	113
Intermodal terminals:	49
Railports:	13
Track length [km]:	3,578
Total access points/1000 km:	**184**

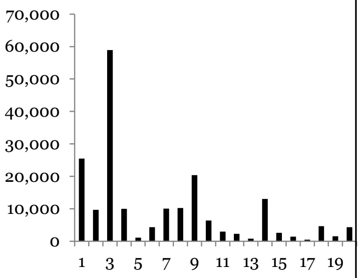
Country-based analysis: Bulgaria

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

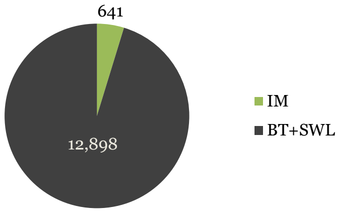
GT03: Ores, quarrying products

GT01: Agriculture, forestry

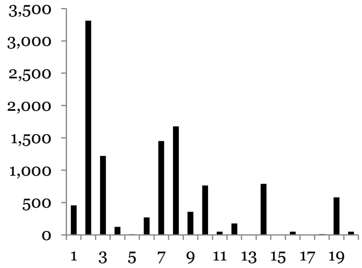
GT09: Other mineral products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

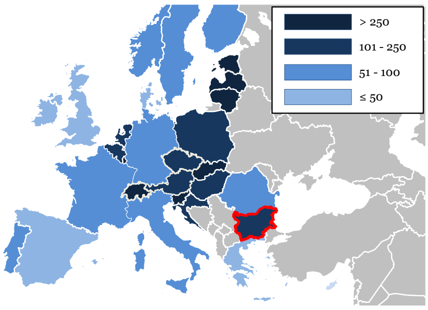
GT02: Coal, natural gas/oil

GT08:Chemical products

GT07: Coke, oil products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

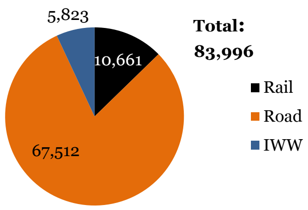


Private sidings:	331
Station with public sidings:	250
Intermodal terminals:	5
Railports:	2
Track length [km]:	4,070
Total access points/1000 km:	**144**

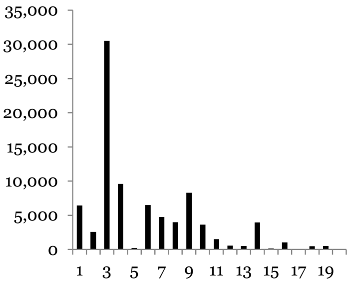
Country-based analysis: Croatia

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

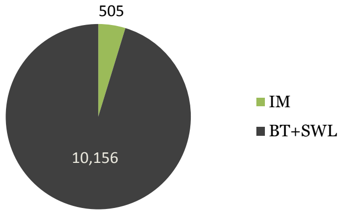
GT03: Ores, quarrying products

GT04: Food products

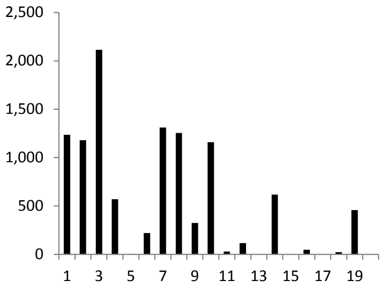
GT09: Other mineral products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

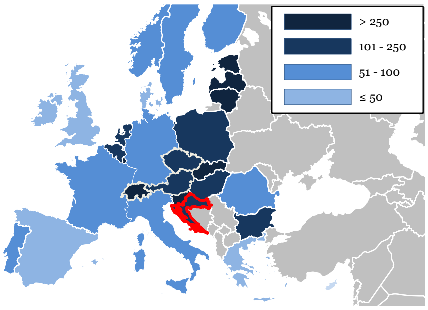
GT03: Ores, quarrying products

GT07: Coke, oil products

GT08: Chemical products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

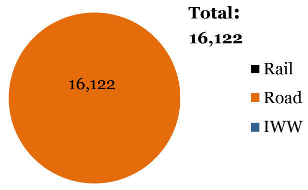


Private sidings:	92
Station with public sidings:	211
Intermodal terminals:	8
Railports:	0
Track length [km]:	2,722
Total access points/1000 km:	**114**

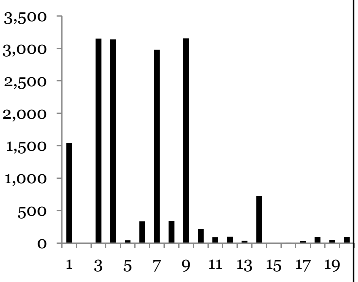
Country-based analysis: Cyprus

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)

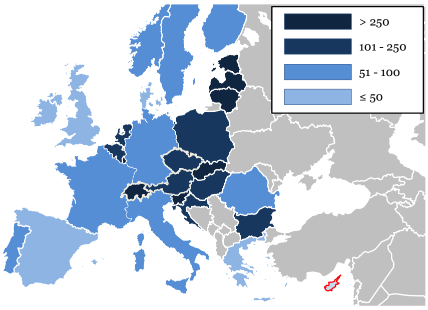


Top 3 commodities:
GT09: Other mineral products
GT03: Ores, quarrying products
GT04: Food products

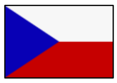
Rail freight market

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

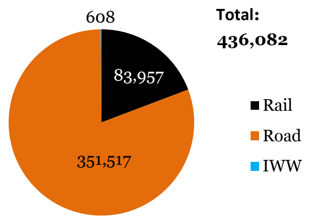


Country-based analysis: Czech Republic

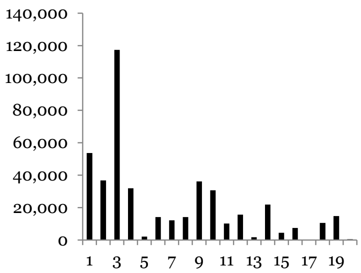


Total freight market

Freight transport volumes 2013 (1,000 t)



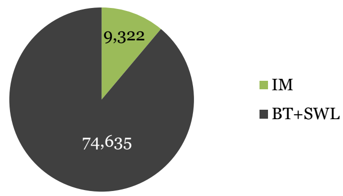
Total transport volumes according NST2007 commodities 2013 (1,000 t)



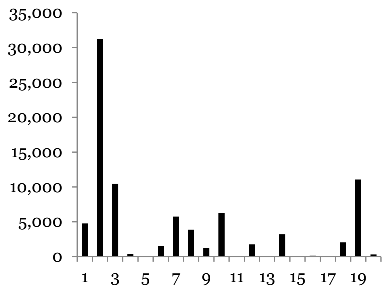
Top 3 commodities:
GT03: Ores, quarrying products
GT01: Agriculture, forestry
GT02: Coal, natural gas/oil

Rail freight market

Rail: type of consignment 2013 (1,000 t)



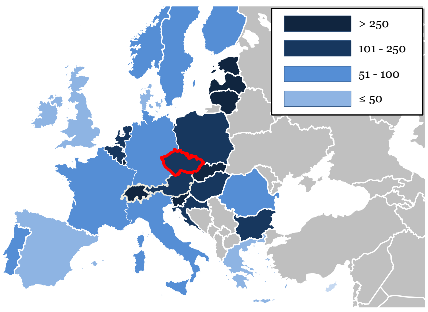
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT02: Coal, natural gas/oil
GT19: Unidentifiable goods
GT03: Ores, quarrying products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

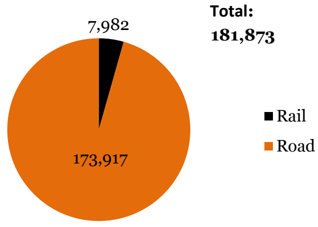


Private sidings:	1,242
Station with public sidings:	244
Intermodal terminals:	21
Railports:	3
Track length [km]:	9,570
Total access points/1000 km:	**158**

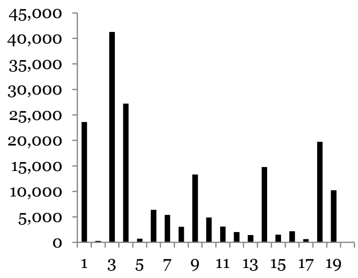
Country-based analysis: Denmark

Total freight market

Freight transport volumes 2013 (1,000 t)



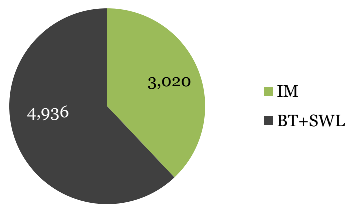
Total transport volumes according NST2007 commodities 2013 (1,000 t)



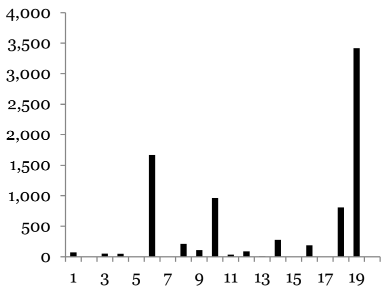
Top 3 commodities:
GT03: Ores, quarrying products
GT04: Food products
GT01: Agriculture, forestry

Rail freight market

Rail: type of consignment 2013 (1,000 t)



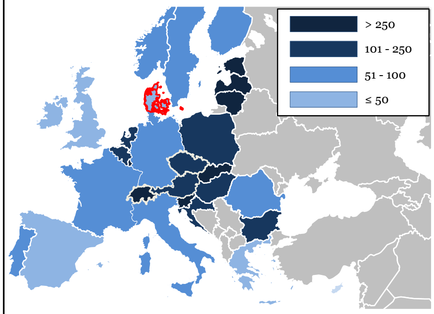
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT19: Unidentifiable goods
GT06: Wood/paper products
GT10: Metal products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

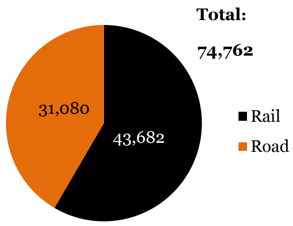


Private sidings:	69
Station with public sidings:	29
Intermodal terminals:	11
Railports:	6
Track length [km]:	3,181
Total access points/1000 km:	**36**

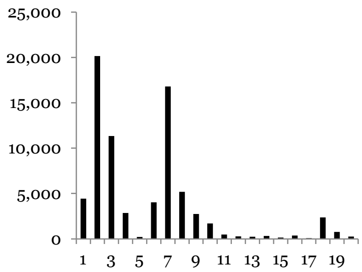
Country-based analysis: Estonia

Total freight market

Freight transport volumes 2013 (1,000 t)



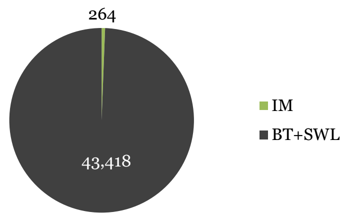
Total transport volumes according NST2007 commodities 2013 (1,000 t)



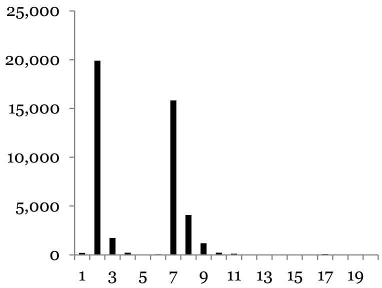
Top 3 commodities:
GT02: Coal, natural gas/oil
GT07: Coke, oil products
GT03: Ores, quarrying products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



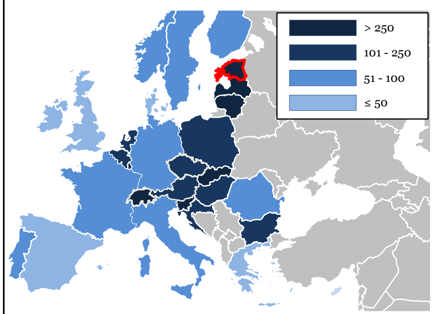
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT02: Coal, natural gas/oil
GT07: Coke, oil products
GT08: Chemical products

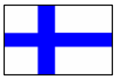
Last-mile infrastructure 2013

Number of access points per 1,000 kilometer



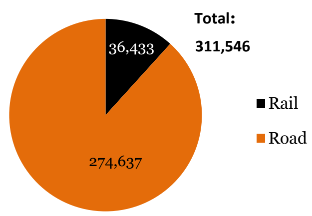
Private sidings:	379
Station with public sidings:	127
Intermodal terminals:	8
Railports:	0
Track length [km]:	1,196
Total access points/1000 km:	**430**

Country-based analysis: Finland

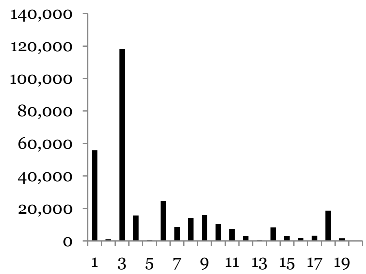


Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

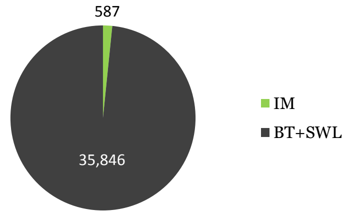
GT03: Ores, quarrying products

GT01: Agriculture, forestry

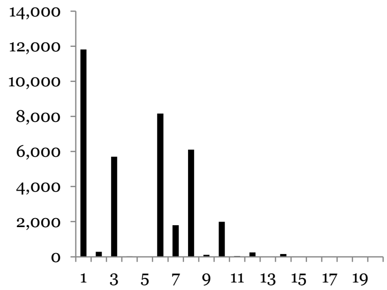
GT06: Wood/paper products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

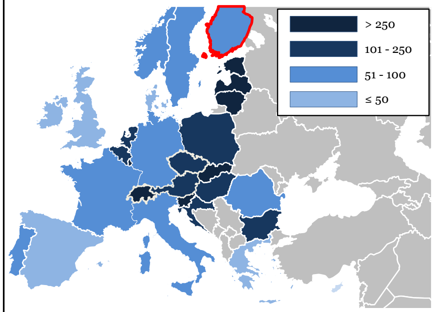
GT01: Agriculture, forestry

GT06: Wood/paper products

GT08: Chemical products

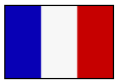
Last-mile infrastructure 2013

Number of access points per 1,000 kilometer



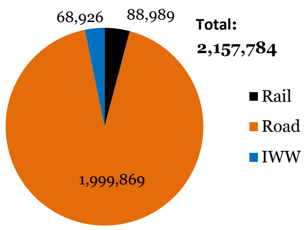
Private sidings:	172
Station with public sidings:	224
Intermodal terminals:	17
Railports:	0
Track length [km]:	5,944
Total access points/1000 km:	**69**

Country-based analysis: France

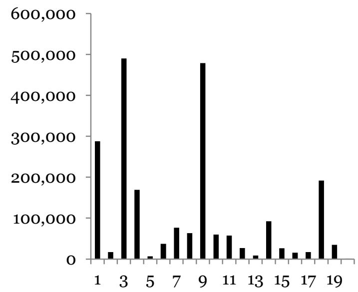


Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

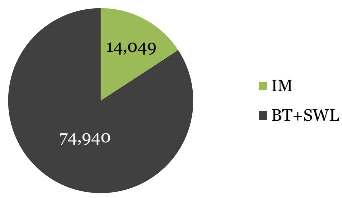
GT03: Ores, quarrying products

GT09: Other mineral products

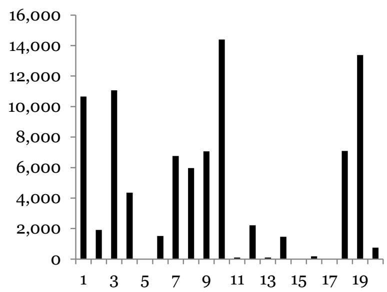
GT01: Agriculture, forestry

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

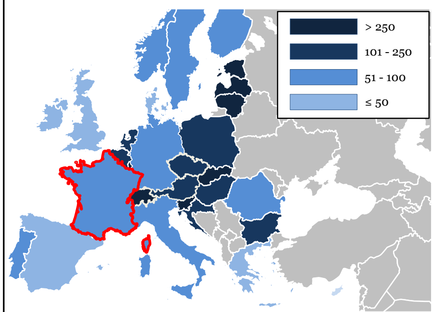
GT10: Metal products

GT19: Unidentifiable goods

GT03: Ores, quarrying products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

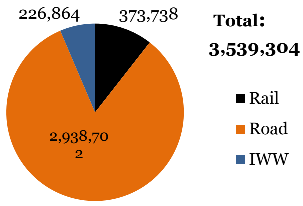


Private sidings:	1,500
Station with public sidings:	332
Intermodal terminals:	72
Railports:	6
Track length [km]:	29,273
Total access points/1000 km:	**65**

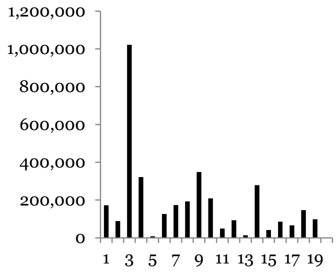
Country-based analysis: Germany

Total freight market

Freight transport volumes 2013 (1,000 t)



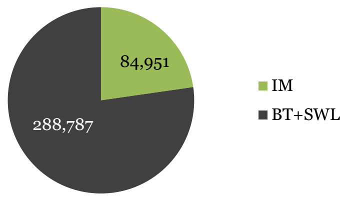
Total transport volumes according NST2007 commodities 2013 (1,000 t)



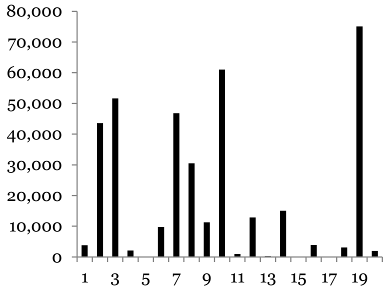
Top 3 commodities:
GT03: Ores, quarrying products
GT09: Other mineral products
GT04: Food products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



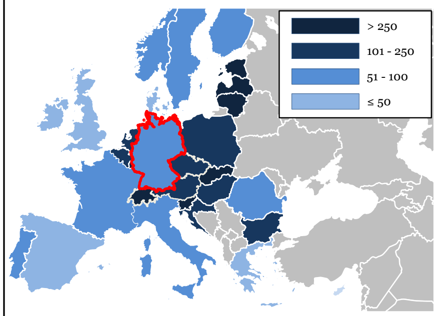
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT19: Unidentifiable goods
GT10: Metal products
GT03: Ores, quarrying products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

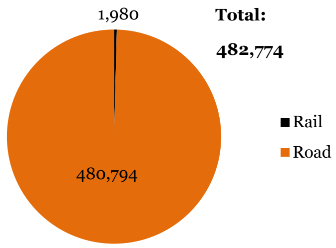


Private sidings:	2,395
Station with public sidings:	475
Intermodal terminals:	154
Railports:	32
Track length [km]:	41,427
Total access points/1000 km:	**74**

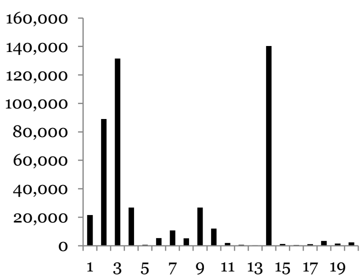
Country-based analysis: Greece

Total freight market

Freight transport volumes 2013 (1,000 t)



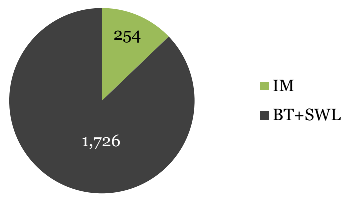
Total transport volumes according NST2007 commodities 2013 (1,000 t)



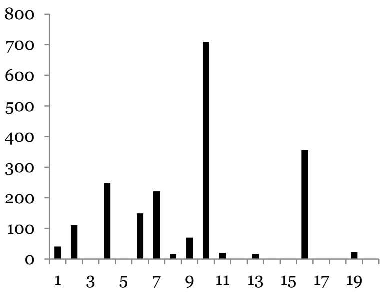
Top 3 commodities:
GT14: Secondary raw materials, waste
GT03: Ores, quarrying products
GT02: Coal, natural gas/oil

Rail freight market

Rail: type of consignment 2013 (1,000 t)



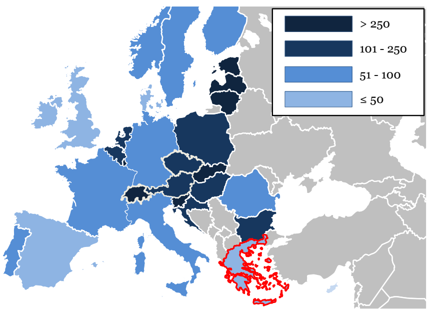
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT10: Metal products
GT16: Transport equipment
GT04: Food products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

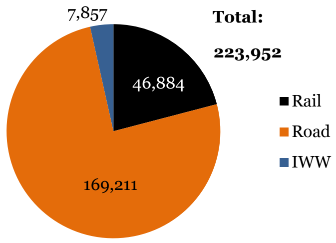


Private sidings:	17
Station with public sidings:	99
Intermodal terminals:	3
Railports:	2
Track length [km]:	2,552
Total access points/1000 km:	**47**

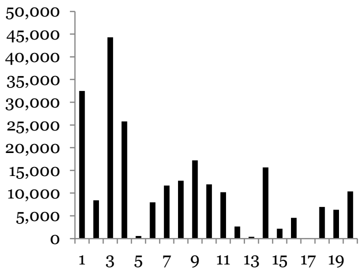
Country-based analysis: Hungary

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

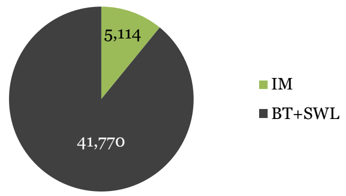
GT03: Ores, quarrying products

GT01: Agriculture, forestry

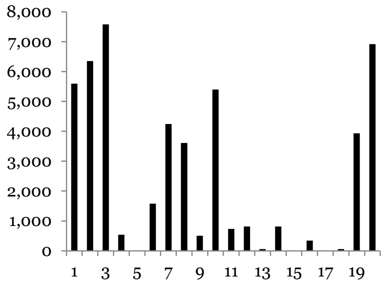
GT04: Food products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

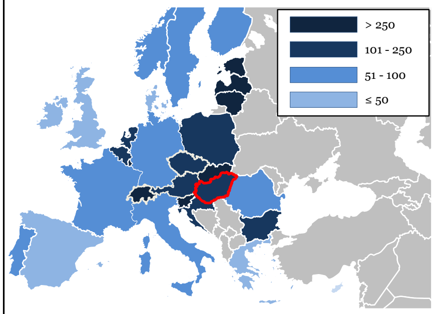
GT03: Ores, quarrying products

GT20: Other goods

GT02: Coal, natural gas/oil

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

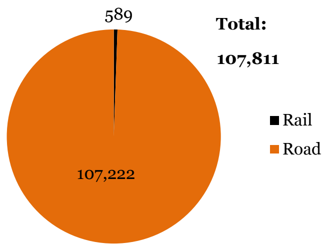


Private sidings:	711
Station with public sidings:	456
Intermodal terminals:	16
Railports:	9
Track length [km]:	8,141
Total access points/1000 km:	**146**

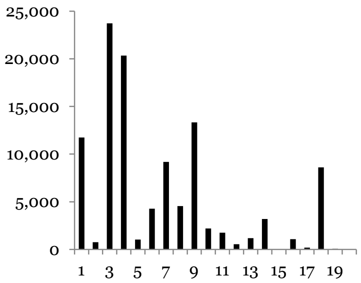
Country-based analysis: Ireland

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

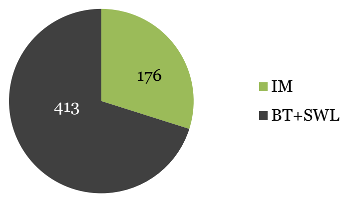
GT03: Ores, quarrying products

GT04: Food products

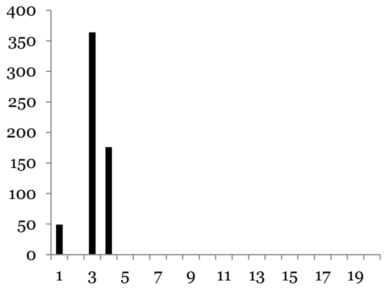
GT09: Other mineral products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

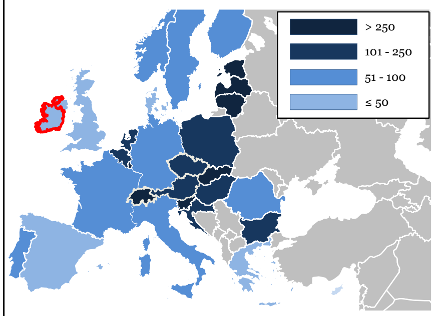
GT03: Ores, quarrying products

GT04: Food products

GT01: Agriculture, forestry

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

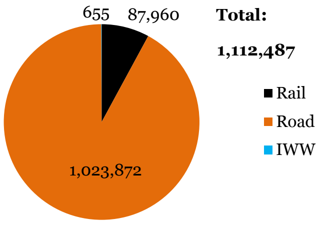


Private sidings:	5
Station with public sidings:	2
Intermodal terminals:	6
Railports:	0
Track length [km]:	1,931
Total access points/1000 km:	**7**

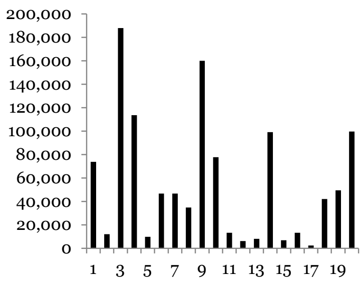
Country-based analysis: Italy

Total freight market

Freight transport volumes 2013 (1,000 t)



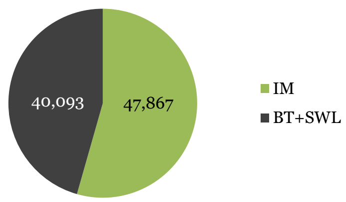
Total transport volumes according NST2007 commodities 2013 (1,000 t)



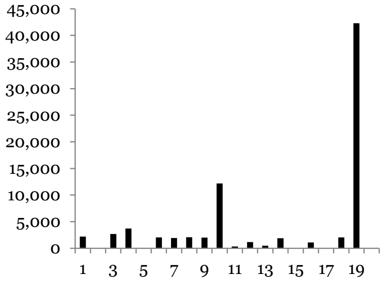
Top 3 commodities:
GT03: Ores, quarrying products
GT09: Other mineral products
GT04: Food products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



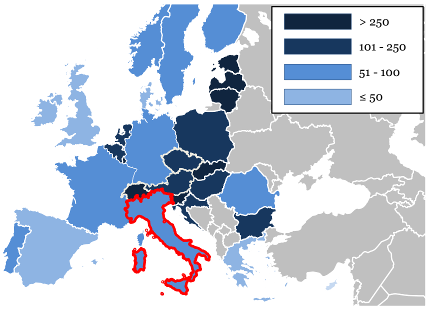
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT19: Unidentifiable goods
GT10: Metal products
GT04: Food products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

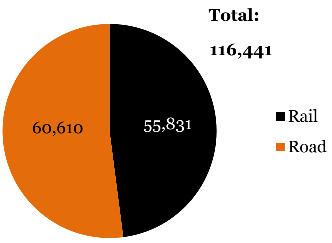


Private sidings:	762
Station with public sidings:	199
Intermodal terminals:	46
Railports:	11
Track length [km]:	16,742
Total access points/1000 km:	**61**

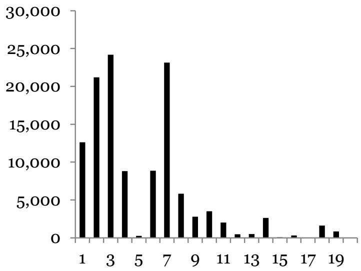
Country-based analysis: Latvia

Total freight market

Freight transport volumes 2013 (1,000 t)



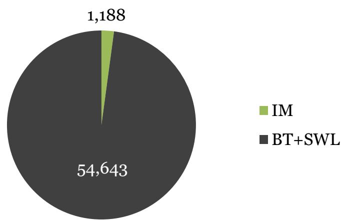
Total transport volumes according NST2007 commodities 2013 (1,000 t)



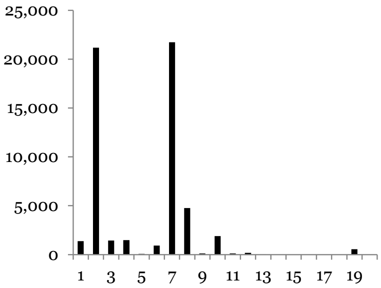
Top 3 commodities:
GT03: Ores, quarrying products
GT07: Coke, oil products
GT02: Coal, natural gas/oil

Rail freight market

Rail: type of consignment 2013 (1,000 t)



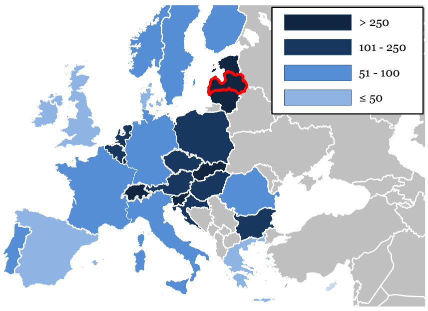
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT07: Coke, oil products
GT02: Coal, natural gas/oil
GT08: Chemical products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

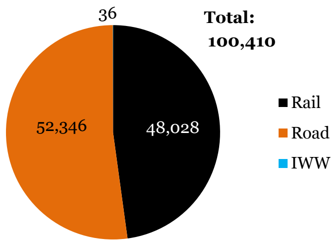


Private sidings:	484
Station with public sidings:	162
Intermodal terminals:	6
Railports:	0
Track length [km]:	1,859
Total access points/1000 km:	**351**

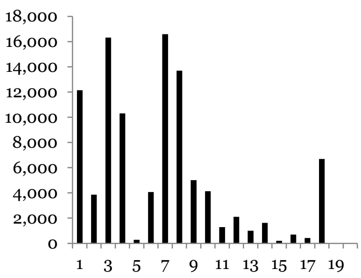
Country-based analysis: Lithuania

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

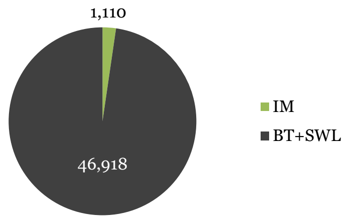
GT07: Coke, oil products

GT03: Ores, quarrying products

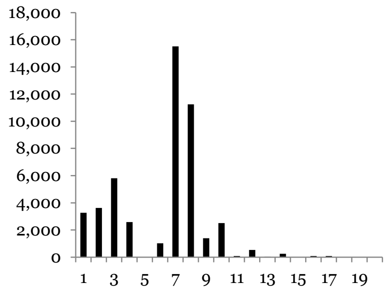
GT08: Chemical products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

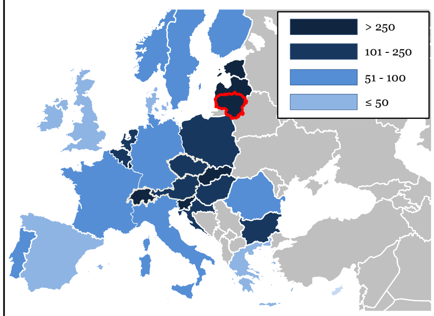
GT07: Coke, oil products

GT08: Chemical products

GT03: Ores, quarrying prod.

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

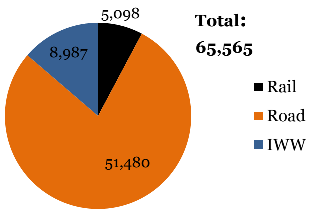


Private sidings:	416
Station with public sidings:	54
Intermodal terminals:	7
Railports:	0
Track length [km]:	1,768
Total access points/1000 km:	**270**

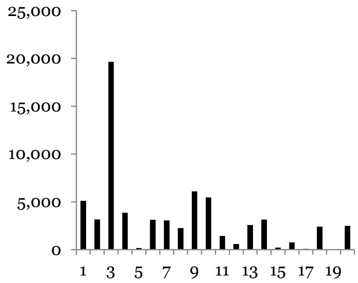
Country-based analysis: Luxembourg

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

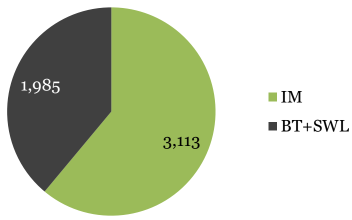
GT03: Ores, quarrying products

GT09: Other mineral products

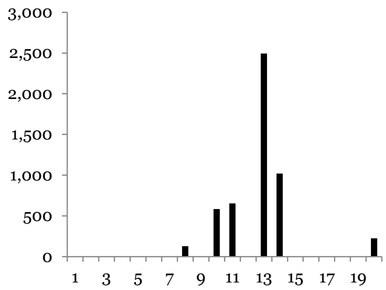
GT10: Metal products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

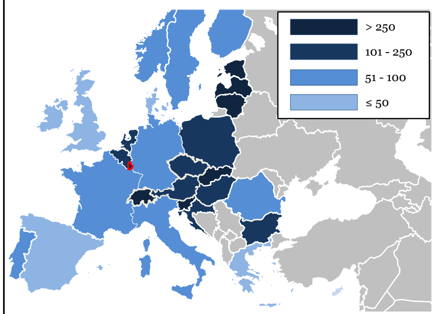
GT13: Furniture

GT14: Secondary raw materials, waste

GT11: Vehicles

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

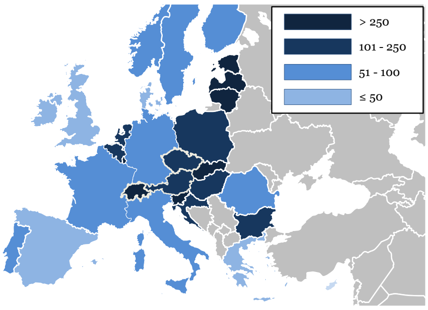


Private sidings:	60
Station with public sidings:	15
Intermodal terminals:	3
Railports:	0
Track length [km]:	275
Total access points/1000 km:	**284**

Country-based analysis: Malta

Total freight market	Rail freight market	Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

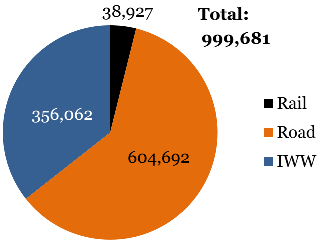


Country-based analysis: Netherlands

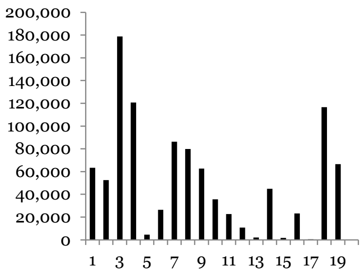
Total freight market	Rail freight market	Last-mile infrastructure 2013

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

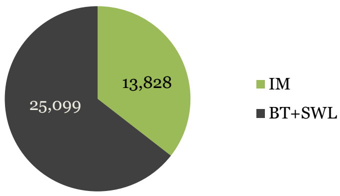
GT03: Ores, quarrying products

GT04: Food products

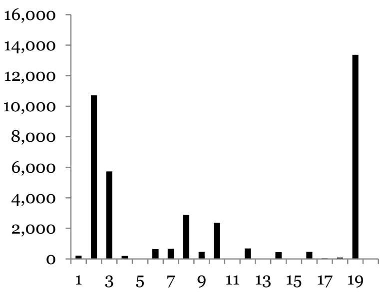
GT18: Grouped goods

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

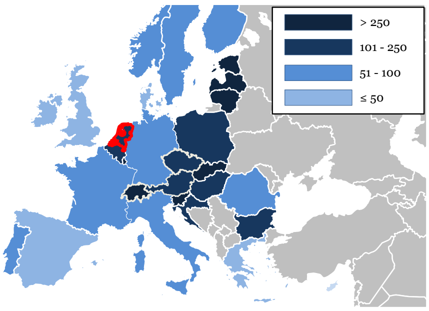
GT19: Unidentifiable goods

GT02: Coal, natural gas/oil

GT03: Ores, quarrying products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

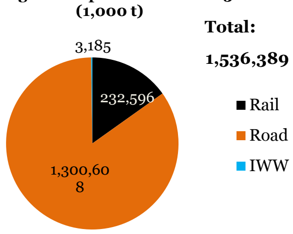


Private sidings:	337
Station with public sidings:	10
Intermodal terminals:	27
Railports:	41
Track length [km]:	3,013
Total access points/1000 km:	**138**

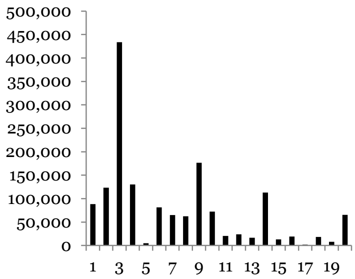
Country-based analysis: Poland

Total freight market

Freight transport volumes 2013 (1,000 t)



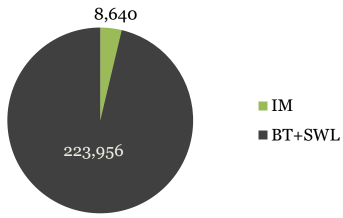
Total transport volumes according NST2007 commodities 2013 (1,000 t)



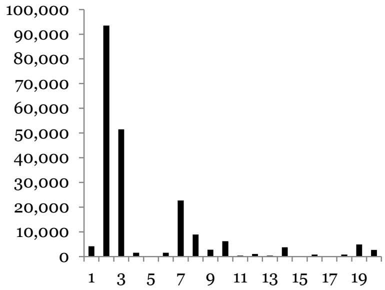
<u>Top 3 commodities</u>:
GT03: Ores, quarrying products
GT09: Other mineral products
GT04: Food products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



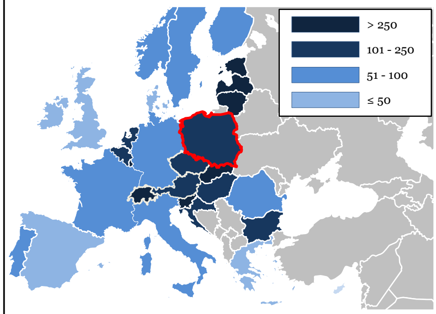
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



<u>Top 3 commodities</u>:
GT02: Coal, natural gas/oil
GT03: Ores, quarrying products
GT07: Coke, oil products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

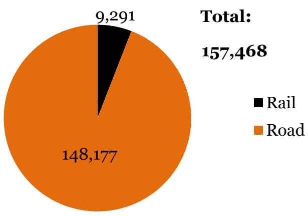


Private sidings:	2,016
Station with public sidings:	414
Intermodal terminals:	35
Railports:	11
Track length [km]:	20,094
Total access points/1000 km:	**123**

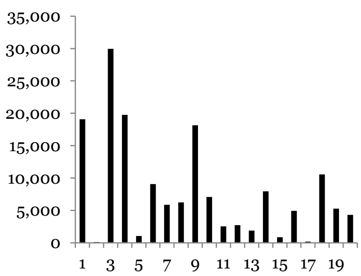
Country-based analysis: Portugal

Total freight market

Freight transport volumes 2013 (1,000 t)



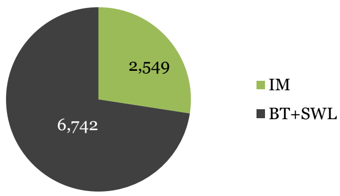
Total transport volumes according NST2007 commodities 2013 (1,000 t)



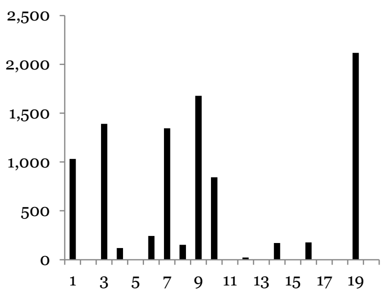
<u>Top 3 commodities</u>:
GT03: Ores, quarrying products
GT04: Food products
GT01: Agriculture, forestry

Rail freight market

Rail: type of consignment 2013 (1,000 t)



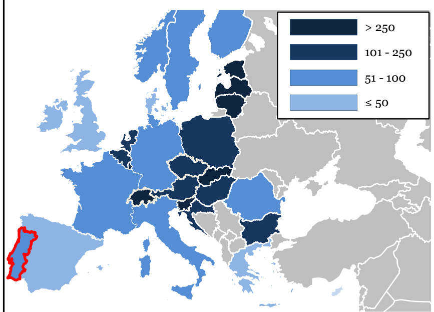
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



<u>Top 3 commodities</u>:
GT19: Unidentifiable goods
GT09: Other mineral products
GT03: Ores, quarrying products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

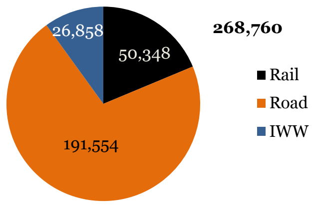


Private sidings:	81
Station with public sidings:	86
Intermodal terminals:	4
Railports:	14
Track length [km]:	2,541
Total access points/1000 km:	**73**

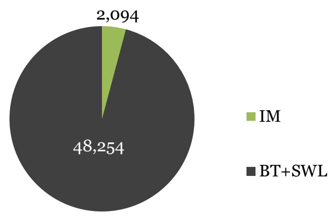
Country-based analysis: Romania

Total freight market	Rail freight market	Last-mile infrastructure 2013

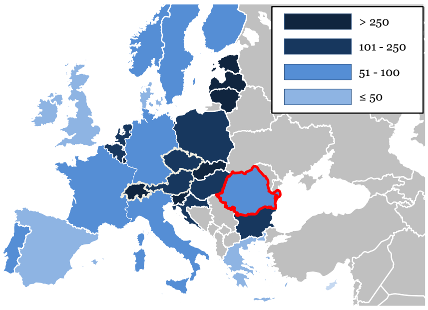
Freight transport volumes 2013 (1,000 t)



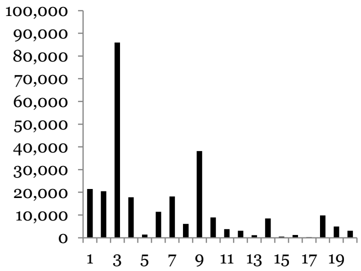
Rail: type of consignment 2013 (1,000 t)



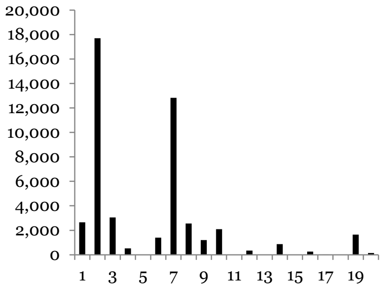
Number of access points per 1,000 kilometer



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT03: Ores, quarrying products
GT09: Other mineral products
GT01: Agriculture, forestry

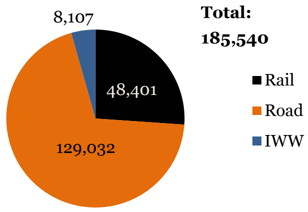
Top 3 commodities:
GT02: Coal, natural gas/oil
GT07: Coke, oil products
GT03: Ores, quarrying products

Private sidings:	109
Station with public sidings:	559
Intermodal terminals:	24
Railports:	6
Track length [km]:	10,777
Total access points/1000 km:	**65**

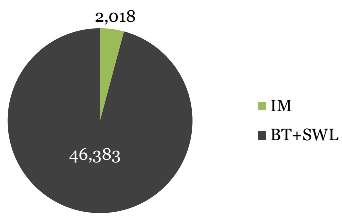
Country-based analysis: Slovakia

Total freight market	Rail freight market	Last-mile infrastructure 2013

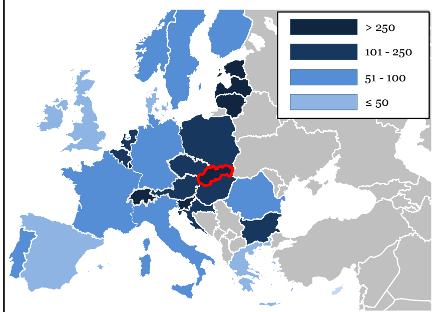
Freight transport volumes 2013 (1,000 t)



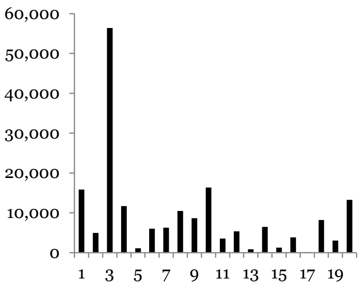
Rail: type of consignment 2013 (1,000 t)



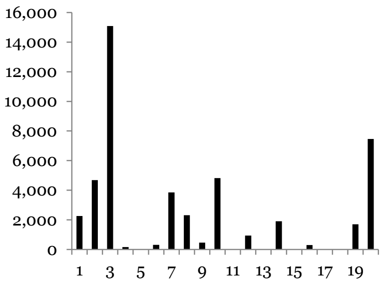
Number of access points per 1,000 kilometer



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
GT03: Ores, quarrying products
GT10: Metal products
GT01: Agriculture, forestry

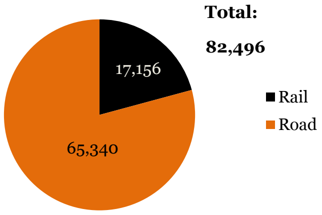
Top 3 commodities:
GT03: Ores, quarrying products
GT20: Other goods
GT10: Metal products

Private sidings:	420
Station with public sidings:	495
Intermodal terminals:	11
Railports:	0
Track length [km]:	3,631
Total access points/1000 km:	**255**

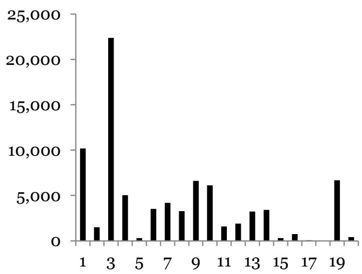
Country-based analysis: Slovenia

Total freight market

Freight transport volumes 2013 (1,000 t)



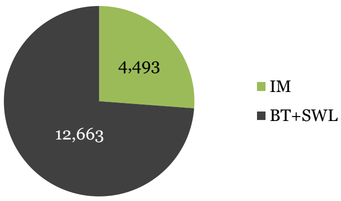
Total transport volumes according NST2007 commodities 2013 (1,000 t)



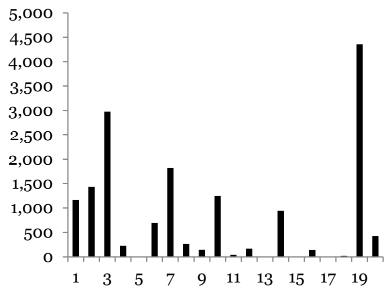
Top 3 commodities:
- GT03: Ores, quarrying products
- GT01: Agriculture, forestry
- GT19: Unidentifiable goods

Rail freight market

Rail: type of consignment 2013 (1,000 t)



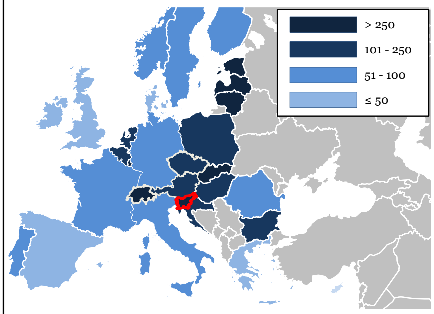
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
- GT19: Unidentifiable goods
- GT03: Ores, quarrying products
- GT07: Coke, oil products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

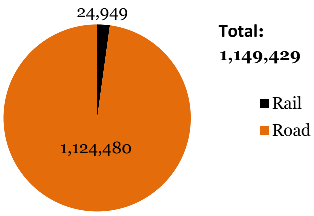


Private sidings:	182
Station with public sidings:	223
Intermodal terminals:	3
Railports:	1
Track length [km]:	1,209
Total access points/1000 km:	**338**

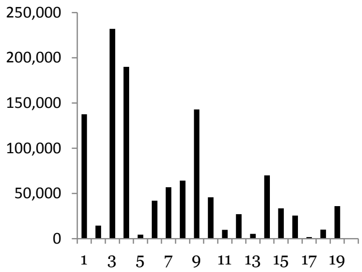
Country-based analysis: Spain

Total freight market

Freight transport volumes 2013 (1,000 t)



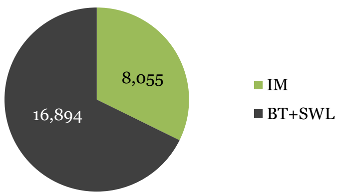
Total transport volumes according NST2007 commodities 2013 (1,000 t)



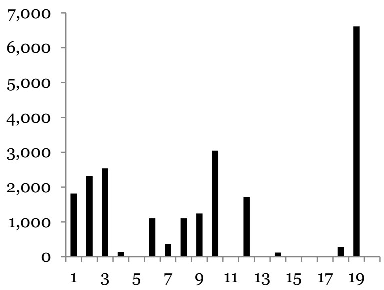
Top 3 commodities:
- GT03: Ores, quarrying products
- GT04: Food products
- GT09: Other mineral products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



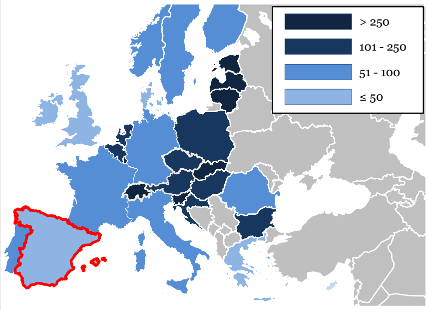
Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:
- GT19: Unidentifiable goods
- GT10: Metal products
- GT03: Ores, quarrying products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

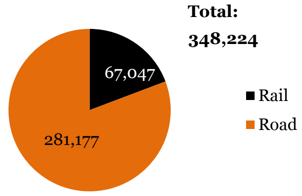


Private sidings:	207
Station with public sidings:	53
Intermodal terminals:	41
Railports:	2
Track length [km]:	13,976
Total access points/1000 km:	**22**

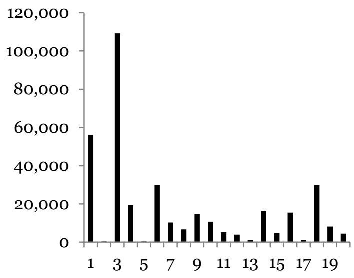
Country-based analysis: Sweden

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



<u>Top 3 commodities</u>:

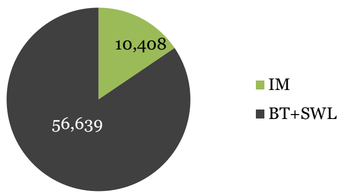
GT03: Ores, quarrying products

GT01: Agriculture, forestry

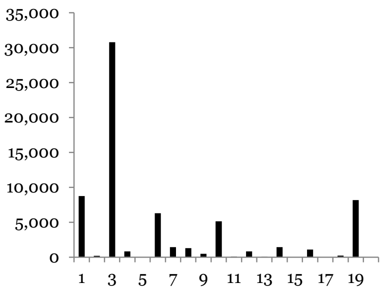
GT18: Grouped goods

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



<u>Top 3 commodities</u>:

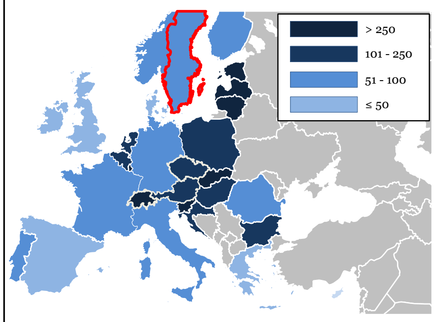
GT03: Ores, quarrying products

GT01: Agriculture, forestry

Gt19: Unidentifiable goods

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

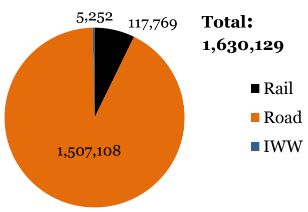


Private sidings:	584
Station with public sidings:	180
Intermodal terminals:	34
Railports:	12
Track length [km]:	11,206
Total access points/1000 km:	**72**

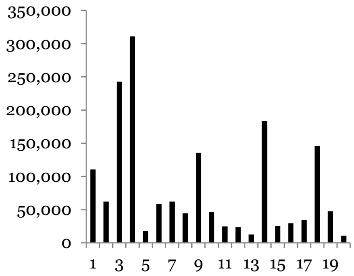
Country-based analysis: United Kingdom

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



<u>Top 3 commodities</u>:

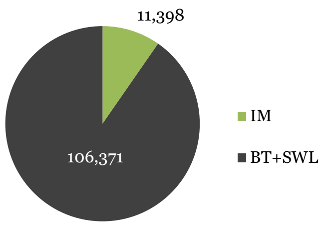
GT04: Food products

GT03: Ores, quarrying products

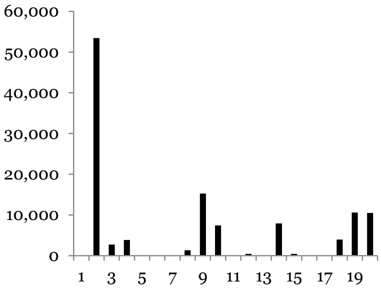
GT14: Secondary raw materials, waste

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



<u>Top 3 commodities</u>:

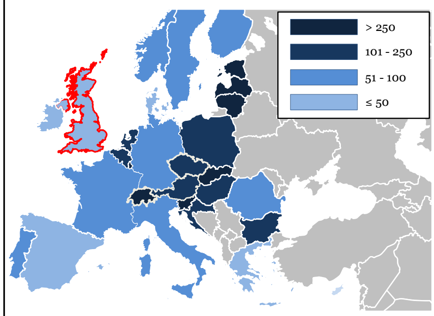
GT02: Coal, natural gas/oil

GT09: Other mineral products

GT19: Unidentifiable goods

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

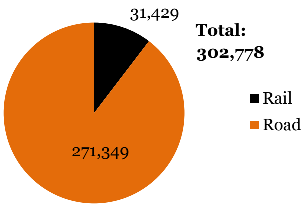


Private sidings:	308
Station with public sidings:	40
Intermodal terminals:	46
Railports:	6
Track length [km]:	15,884
Total access points/1000 km:	**25**

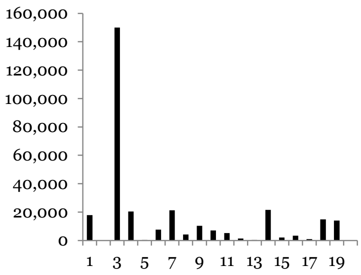
Country-based analysis: Norway

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

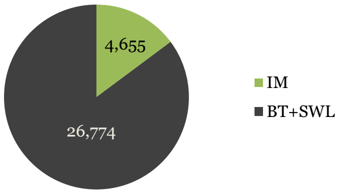
GT03: Ores, quarrying products

GT14: Secondary raw materials, waste

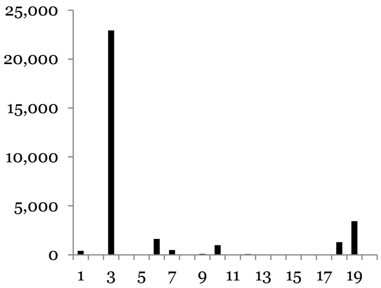
GT07: Coke, oil products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

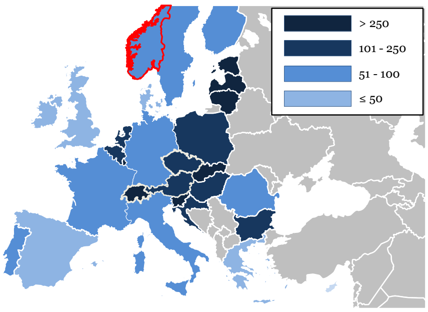
GT03: Ores, quarrying products

GT19 :Unidentifiable goods

GT06: Wood/paper products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer

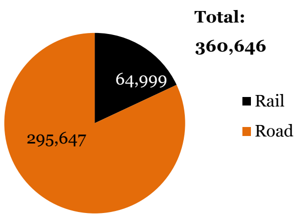


Private sidings:	234
Station with public sidings:	50
Intermodal terminals:	19
Railports:	2
Track length [km]:	3,891
Total access points/1000 km:	**78**

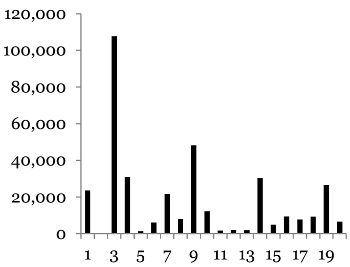
*Country-based analysis: Switzerland**

Total freight market

Freight transport volumes 2013 (1,000 t)



Total transport volumes according NST2007 commodities 2013 (1,000 t)



**Eurostat does not provide data on Swiss IWW*

Top 3 commodities:

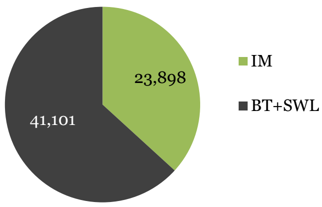
GT03: Ores, quarrying products

Gt09: Other mineral products

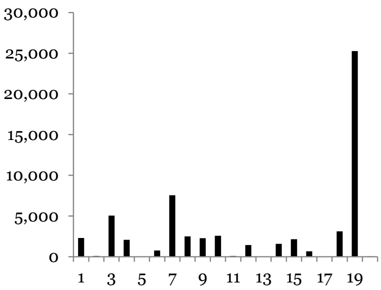
Gt04: Food products

Rail freight market

Rail: type of consignment 2013 (1,000 t)



Rail transport volumes according NST2007 commodities 2013 (1,000 t)



Top 3 commodities:

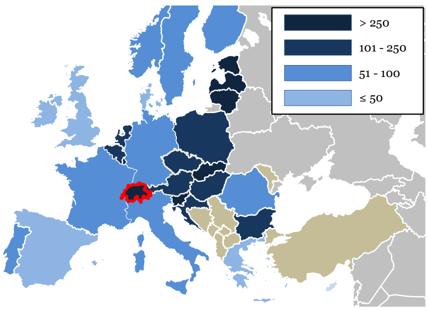
GT19: Unidentifiable goods

Gt07: Coke, oil products

GT03: Ores, quarrying products

Last-mile infrastructure 2013

Number of access points per 1,000 kilometer



Private sidings:	1,300
Station with public sidings:	401
Intermodal terminals:	33
Railports:	3
Track length [km]:	5,124
Total access points/1000 km:	**339**

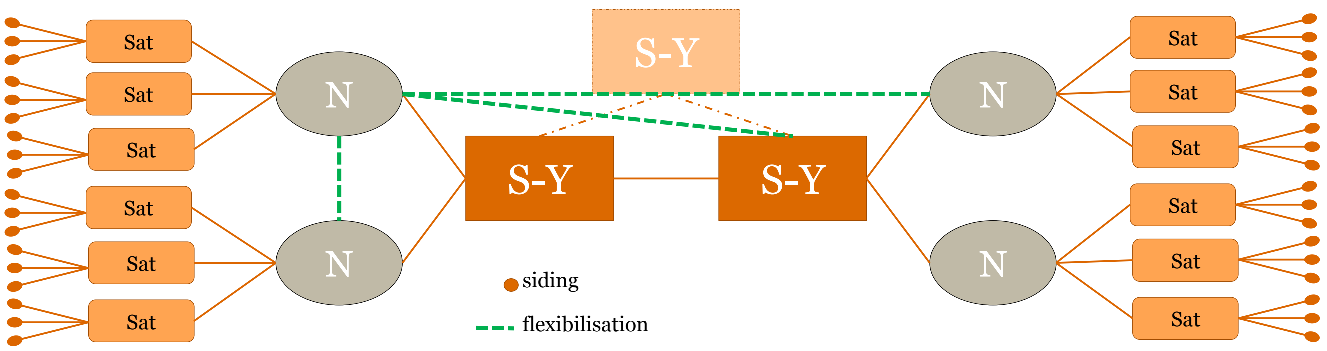
Annex I – Typical rail freight production systems and selected case studies

1. Single wagon/wagon group production systems

Single wagon case study 1: Node hub system of DB

- Operation principle:
  - Hierarchic, three-stage collecting/distribution system for single wagons/wagon groups (see Figure 94), in operation since 1975:
    1. Sidings are assigned to satellites (Sat): stations for local wagon collection/distribution, mostly no own staff and shunting devices. Several satellites are connected to (normally exactly one);
    2. Node station (N): operation centre for regional wagon collection/distribution, normally with own shunting resources (staff, engines, hump): split-up and composing of trains from/to satellites and (normally exactly one);
    3. Shunting yard (S-Y): composing station for (highly utilised) long-haul trains to other shunting yards.
  - In recent years continuous reduction of sidings and stations, reduction of operational stages by direct connections between Node stations ("Node bridges") or bypassing shunting yards.
  - Currently replacement by system "200x": direct, more frequent services between few high capacity train composing stations with direct connection of satellites (level of Node stations does actually not exist anymore).
- Geographical occurrence: Germany, but typical for single wagon systems in many countries;
- Commodities/Industrial branches/Volumes: Principally no restrictions, actually SWL classics like paper, chemicals, scrap;
- Types of last-mile infrastructure: private sidings, (stations with public sidings, railports);
- Sources: ETR December 2006, p 844ff; RailBusiness 8/2010, Entwicklung einer Methode zur Abschätzung des containerisierbaren Aufkommens im Einzelwagenverkehr und Optimierung der Produktionsstruktur (Bruckmann, 2006).

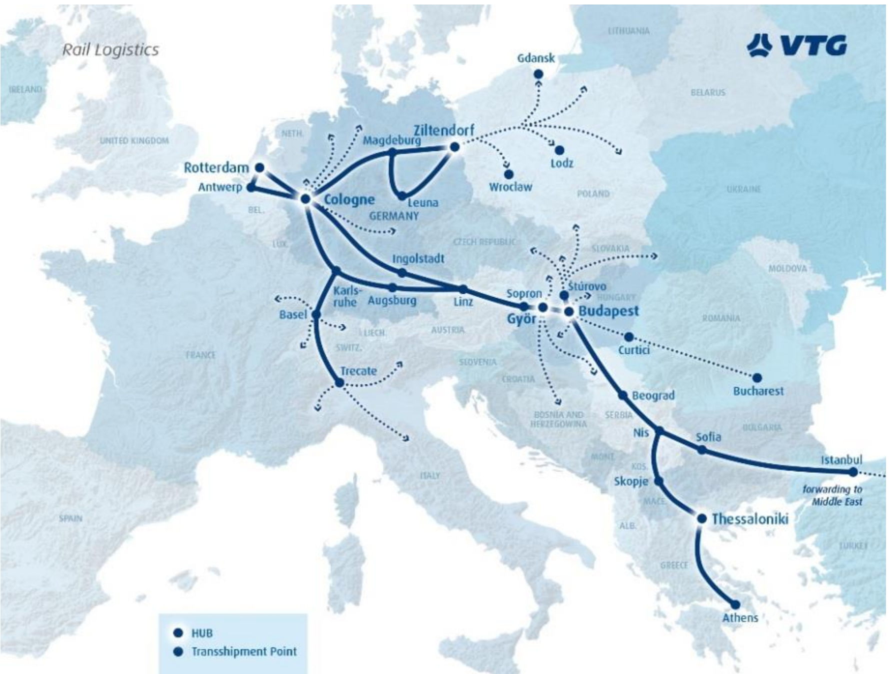
Figure 94 - Principle operation scheme of DB Node hub system



Single wagon case study 2: RETRACK Network by VTG Rail Logistics

- RETRACK (Reorganisation of Transport networks by advanced Rail freight Concepts) was a project funded by the European Commission within FP6 programme. It ran from 2007 to 2012 and aimed shifting freight from road towards rail;
- After the end of the project, RETRACK-consortium partner VTG went on operating on parts of the RETRACK-corridor in cooperation with diverse partners;
- Operational procedures:
    - The production concept is a combination of liner trains and a hub system with single wagons/wagon groups.
    - Long haul: Two main relations (Köln - Györ/Hegyeshalom and Köln - Frankfurt (Oder)/Ziltendorf) offer single wagon/wagon group services either along the entire route or on selected sections with intermediate stops, e.g. in Hannover, Minden or Magdeburg (see Figure 95).
      In Köln, VTG has rented tracks for train composing with their own shunting resources. Wagon transfer is done between different lines and connections to other single wagon networks in dedicated hubs.
    - LMI: At intermediate stops, e.g. Augsburg main station, VTG hands over wagons/wagon groups to local partners to perform de-/attachment of wagons/wagon groups and shunting movements from/to customers' sidings.
- Geographical occurrence: From Netherlands/Belgium via Germany, Austria, Hungary to Greece and Turkey, connections to further destinations (e.g. Poland);
- Commodities/Industrial branches/Volumes: Primarily mineral oil, chemical products, further bulk and general cargo;
- Types of last-mile infrastructure (LMI): private sidings, (railports, intermodal terminals);
- Sources: Güterbahnen 2/2015, p18ff; VTG Newsletter: Neue Achse für RETRACK-Korridor (http://www.vtg.de/v/s/content/162198/220872), Interview with VTG transport management.

Figure 95 - Principle operation scheme of VTG RETRACK services



Source: VTG

Single wagon case study 3: EIX train by e.g.o.o.

- Operational procedure:
  - Hub system with 4 hubs (Aurich, Lippstadt, Magdeburg, München), connected intermediate stations and feeder services (see Figure 96) operated by e.g.o.o. (Eisenbahngesellschaft Ostfriesland-Oldenburg), subsidiary of Enercon group (Aurich)
  - Group trains → sorted by destination, no mixed trains
  - Long haul: 5 services/week on two main relations:
    1. Georgsheil - Dörpen (DUK-Terminal) - Rheine (GVZ) – Lippstadt

       → Wagon exchange with feeder trains and service to/from
    2. Magdeburg/Böhnen) - Nürnberg (Tricon terminal) - Ingolstadt (connection to Linz-feeder) - München (DUSS terminal)
  - LMI: wagons must be sorted in/from dedicated wagon groups → respective sorting capacity required
- Geographical occurrence: Mainly Germany; connections to Austria, Italy, Portugal, Greece;
- Commodities/Industrial branches/Volumes: Paper, food, steel, large construction elements for wind energy plants, intermodal LUs;
- Types of Last-mile infrastructure (LMI): private sidings, intermodal terminals/freight villages/seaports;
- Sources: Güterbahnen 2/2015, p 32; RailBusiness 4/2015, p 14; RailBusiness 7/2015, p13, www.duk-doerpen.de/aktuelles.html

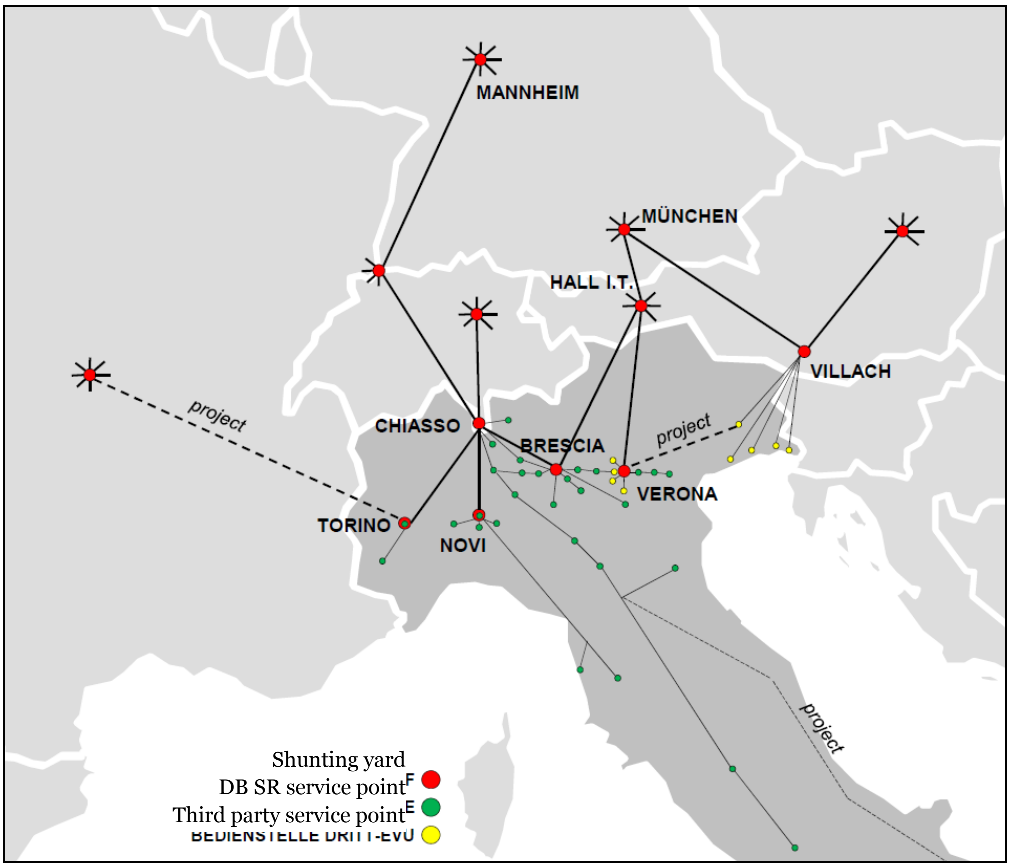
Figure 96 - Principle operation scheme of e.g.o.o. services

Source: DUK Dörpen

Single wagon case study 4: DB SR Italy single wagon load system

- DB Schenker Rail Italia is the main railway operator in Italy, also providing the rudimentary remains of Italian single wagon traffic;
- Operational procedure:
    - Train formation is performed in five shunting yards, thereof three (Chiasso, Brescia and Verona) are connected directly to international destinations (see Figure 97);
    - High frequent services are offered on dedicated freight “highways” from/to Chiasso and Brescia with transmission to Torino and Novi;
    - All shunting yards provide last-mile services to private sidings and railports. These services include providing/picking-up wagons in the last-mile transfer station as well as (on demand) shunting activities inside the private sidings.
- Geographical occurrence: Northern Italy, with connections to/from Germany, Switzerland, Austria;
- Commodities/Industrial branches/Volumes: steel, paper, chemicals, food; 12,500 trains and 172,000 wagons p.a., SWL: 177 trains/week & 114,000 wagons p.a., block trains: 53 trains/week & 58,000 wagons p.a. (2014);
- Types of Last-mile infrastructure (LMI): private sidings, railports;
- Sources: ViWas deliverable D4-1: Target Markets and KPIs; Railways 01/2007, p 29; ETR 04/2011, p 10ff, Railways 01/2015, p32/33; NORDCARGO s.r.l. – Service Design & Resources Planning (Daniele Ellero, Zürich, 13.05.2014); Railways 02/2015, p 10ff & 50/51.

Figure 97 - Principle operation scheme of DB SR single wagon system in Italy

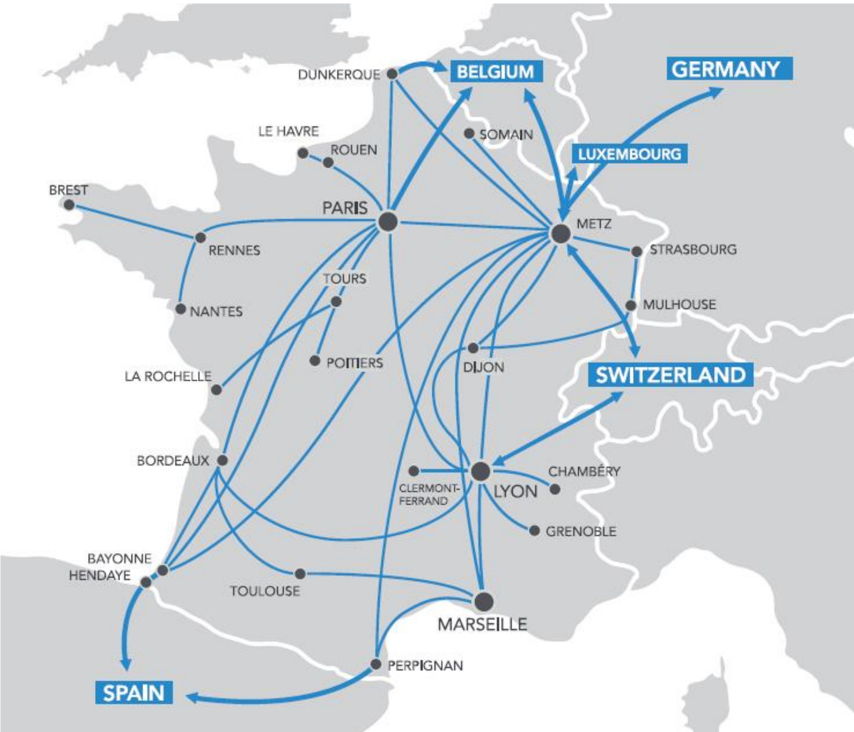


Source: DB Schenker Rail Italy

Single wagon case study 5: MLMC (Multi-lots multi-clients) by Fret SNCF

- Important economic areas in France and border crossing are connected via regular shuttle trains. In contrast, destinations with low demand have been cancelled in order to expand service frequency on routes with high demand;
- Reduction of number of small service points → (partially) replacement by railports (platforms);
- Operational procedures:
  - Long haul: connecting direct trains from platform to platform (see Figure 98), about 30 regular shuttle services, local distribution from/to those platforms;
  - LMI: Distribution from/to customers private siding by train or, if missing, by truck.
- Geographical occurrence: France; 30 platforms and 800 points served (final customer: siding or site served by truck):
  - France by Fret SNCF;
  - From/to Belgium by Captrain;
  - From/to Germany by Captrain;
  - From/to Switzerland by partnership with CFF Cargo.
- Commodities/Industrial branches/Volumes: All types of cargo; particular importance of steel and chemical industry; totally 180,000 loaded wagons/a (thereof 55% international), 185 clients, 400 weekly trains (2012);
- Types of Last-mile infrastructure (LMI): private sidings, railports;
- Sources: SNCF (www.medias.sncf.com/sncfcom/pdf/fret/Planche_SNCF_FRET_WAGON_ISOLE_V2.pdf and www.sncf.com/en/freight/single-wagon and information flyer); ViWas deliverable D4-1: Target Markets and KPIs.

Figure 98 - Principle operation scheme of Fret SNCF MLMC system

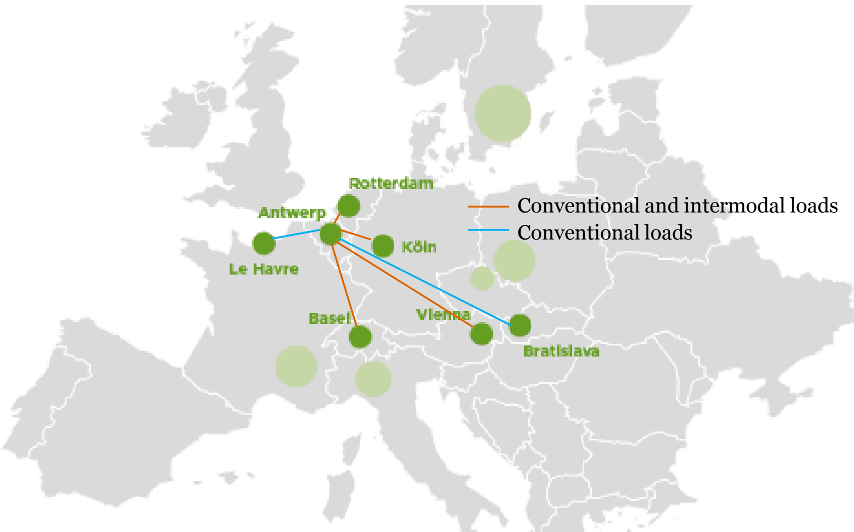


Source: Fret SNCF

Single wagon case study 6: Green Xpress Network (GXN) by B-Logistics

- Belgian single wagon traffic is a combination of a hub-and-spoke system (domestic collection/ distribution) and a shuttle system (international);
- Hub Antwerp is the central train composing station for single wagon traffic in Belgium. It is connected to 215 service points in Belgium and 564 points in Europe;
- Operational procedures:
  - The spokes consist of private sidings, stations (railports) and smaller marshalling yards, the latter collecting wagons from several sidings. Liner trains with intermediate stops connect these service points with the central hub;
  - In Antwerp hub non-stop shuttle trains for the Green Xpress Network (GXN) are composed with conventional and intermodal cargo (see Figure 99):
    - Swiss Xpress (cooperation with SBB cargo)
    - Köln Shuttle (cooperation with Rhein-Cargo)
    - Rotterdam Shuttle (cooperation with Xpedys and Locon Benelux)
    - Le Havre Express (cooperation with OSR France)
    - Austria Xpress (cooperation with LTE)
    - Slovakia Express (cooperation with LTE and ZSSK Cargo)
  - At destinations of these shuttle services, the wagons are transferred to other single wagon networks.
- Geographical occurrence: Belgium; services to Basel/Cologne/Rotterdam/Le Havre/Vienna/ Bratislava;
- Commodities/Industrial branches/Volumes: Conventional and intermodal loads; 725 SWL trains/week;
- Types of Last-mile infrastructure: private sidings, railports, intermodal terminals (inland, seaports);
- Sources: RailBusiness 4/2015, p 15; RailBusiness 20/2015, p 10; SNCB logistics (www. greenxpressnetwork.com, www.sncblogistics.be/services); Railway Gazette June 2015, p 26/29.

Figure 99 - Green Xpress Network by B-Logistics



Source: SNCB logistics, edited by HaCon

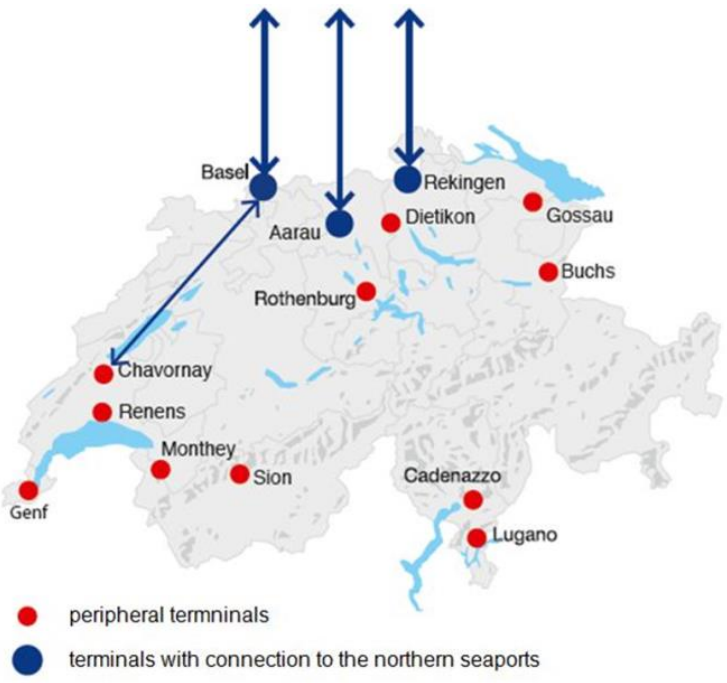
Single wagon case study 7: Swiss Split by SBB Cargo

- Swiss Split is a combination of intermodal and single wagon load transport aiming at replacing road pre-/end-haulage by single wagon traffic;
- Essential part of the system is a special container wagon type for last-mile transport ensuring accessibility of the loading unit by forklifts from all four sides. The system is therefore restricted to container transport and to dedicated customers;
- Operational procedures (exemplarily for import direction, see Figure 100):
  - Long haul: Import containers from the North Sea ports dedicated to the Swiss Split system are transferred to the domestic Swiss rail network via the gateway terminals Basel, Aarau or Rekingen;
  - LMI: The major part (ca. 90%) of these Swiss Split volumes is delivered to the customer's siding by rail. For this purpose, a rail-rail transhipment from the "normal" container inbound wagon to a dedicated Swiss Split container wagon is performed. These wagons are incorporated into the regular single wagon transport system to the customer's siding;

    If the Swiss Split customer is not reachable via siding, the container wagon is sorted out and incorporated into the single wagon system by shunting and routed to "Peripheral terminals" as close as possible to the customer. Thus, in these cases (ca. 10% of the Swiss Split volumes), a road bound end-haulage is still necessary.

    Loading/unloading of containers within private sidings request transhipment infrastructure like (preferably) head-/side-ramps or (at least) paved tracks accessible for forklifts.
- Geographical occurrence: Switzerland;
- Commodities/Industrial branches/Volumes: Maritime container flows from/to the North Sea ports (mainly import), current volume: ca. 70,000 containers per year;
- Types of Last-mile infrastructure (LMI): private sidings, intermodal terminals;
- Sources: ViWas deliverable D4-1: Target Markets and KPIs, SBB Cargo.

Figure 100 - Swiss Split terminals



Source: SBB Cargo

Single wagon case study 8: ChemLink Network by ChemOil Logistics AG

- ChemLink is an example for an international, industry branch (here: primarily chemical and petrochemical cargo) related transport network. It was established by ChemOil Logistics AG, subsidiary of SBB Cargo;
- The entire service consists of dedicated block train relations and a network of liner trains for wagon groups;
- Operational procedures:
  - Long haul: wagon groups are collected from sidings by local partners and delivered to dedicated feeder stations. The feeder stations serve as train composing stations for the long haul services. During long-haul run, selected intermediate stations (main locations of chemical/mineral oil industry) are served;
  - LMI: depending on wagon (group) order in the trains, wagon must be sorted in/out at feeder stations and intermediate stops accordingly.
- Geographical occurrence: Belgium, the Netherlands, Germany, France, Switzerland, Italy;
- Commodities/Industrial branches/Volumes: Dangerous goods, mainly chemicals and mineral oils (approx. 10 Mio. t of dangerous goods p.a., status 2015);
- Types of Last-mile infrastructure (LMI): private sidings;
- Sources: RailBusiness 11/12, p 14ff; ChemOil (www.chemoil.ch/fileadmin/user_upload/broschueren/ChemOil_Logistics_Flyer_EN.pdf), Swiss Mover (www.swissmovers.org/partner/chemoil-logistics-ag/).

Figure 101 - ChemLink Network

Source: Chemoil

Single wagon case study 9: Rail11 Paper Network

- Rail11 Paper Network system combines block trains and single wagon load and was originally designed for paper transport. The services are organised by ScandFibre Logistics AB (SFL) and produced with selected rail companies;
- South going shipments origin from paper mills in Sweden (and Norway) and run to terminals in continental Europe. Vice versa, shipment capacities are sold to third parties (e.g. IKEA, ICA, Zeta, Coca Cola, Kakeldax);
- Operational procedures (compare Figure 102):
  - Long haul: feeder trains (wagon groups and block trains by Green Cargo AB, Hector Rail) from paper mills' private sidings meet in Swedish shunting yards (main hub Hallsberg) from where shuttle trains go to the shunting yards Maschen and Dortmund (Captrain takes over) and further to terminals in continental Europe; (in Woippy MLMC by FretSNCF takes over); on the way back, wagon groups for different customers combined to a full train are going northwards;
  - LMI: depending on wagon (group) order in the trains, wagon must be sorted in/out at sidings and terminals.
- Geographical occurrence: Sweden and continental Europe (40 terminals);
- Commodities/Industrial branches/Volumes: south going: paper (1.9 Mio. t p.a., 30.000 wagons p.a.), north going: diverse goods, e.g. food, dry goods (return filling rate 55%);
- Types of Last-mile infrastructure (LMI): Private sidings, intermodal terminals (inland and seaports);
- Sources: RailBusiness 19/2015, p 15, ScandFibre (http://scandfibre.se/en/); http://scandfibre.se/wp-content/uploads/2014/07/ScandFibre-pres-Scanmed-RFC-140626.pdf

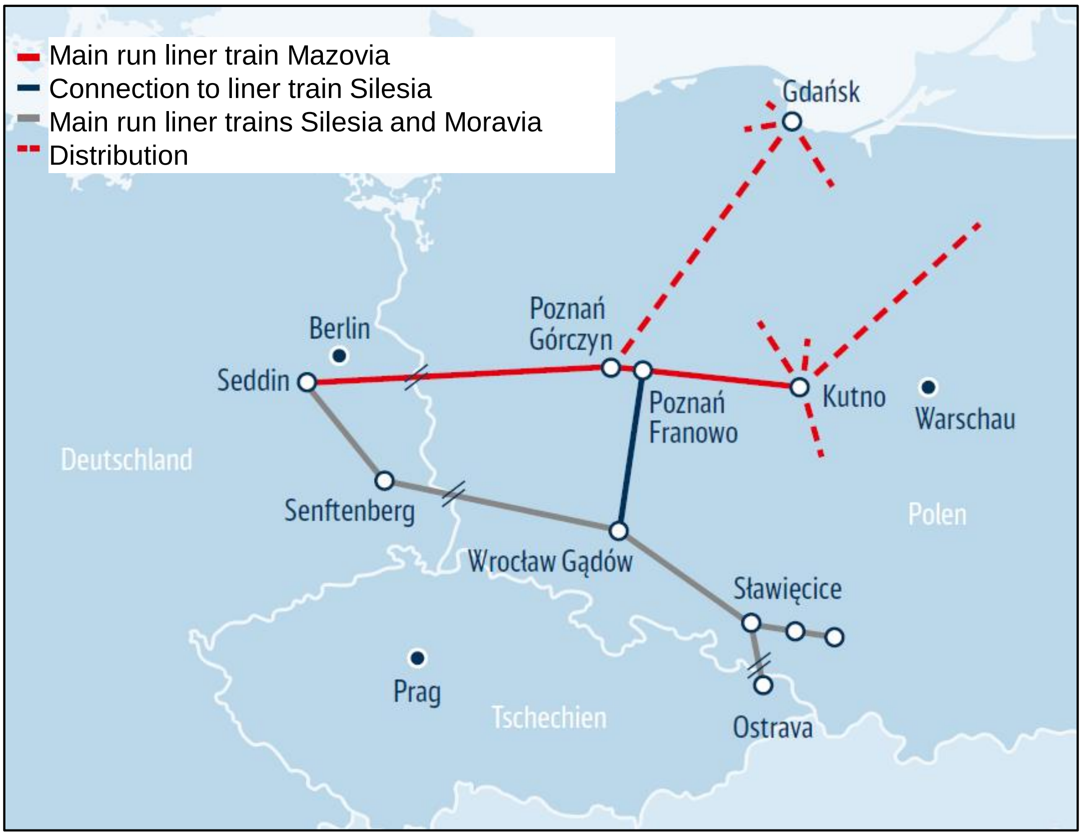
Figure 102 - Rail11 Paper Network

Source: Scandfibre

Single wagon case study 10: Liner train network of DB SR Polska

- The Polish liner system of DB SR consists of the main lines:
  - Seddin (DE)–Poznan (PL)–Kutno (PL);
  - Seddin (DE)–Wroclaw (PL)–Ostrava (CZ);
  - Wroclaw (PL)–Poznan (PL).
- Operational procedures:
  - Long haul: liner trains with intermediate stops. In some cases, block trains of Lotos Koley are used and filled up with single wagons/wagon groups to enhance train utilisation. In Seddin, Poznan, Kutno and Ostrava connections to other single wagon networks in Germany, Poland and Czech Republic are possible;
  - LMI: Local service of private sidings is performed by spedkol (subsidiary of DB SR Polska and Lotos Koley).
- Geographical occurrence: Poland with connections to Germany, Czech Republic;
- Commodities/Industrial branches/Volumes: particularly chemical products, metal scrap, white goods;
- Types of Last-mile infrastructure (LMI): private sidings;
- Sources: DB SR (Railways 01/2014, p. 20ff).

Figure 103 - Liner train network for DB SR Polska



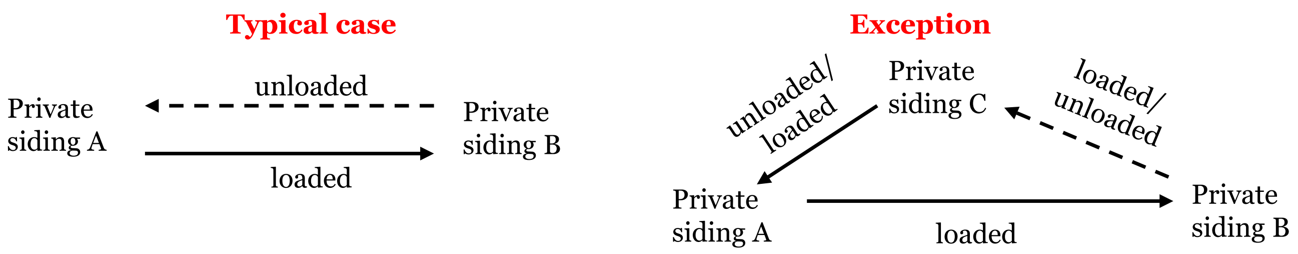
Source: DB SR

2. Block train production systems

Block train case study 1: “Standard” operation

- Block trains are running between (private) sidings without change of wagon configuration (1 train = 1 consignment = 1 consignment note); typical case: 1 loaded + 1 empty run;
- A variation might include a third private siding in order to save empty runs. Possible only in exceptional cases, due to determination to dedicated, specialised wagon types and to integration in customer´s logistic procedures (see Figure 104);
- Operational procedures:
    - Long haul: No change of wagon configuration; intermediate stops might occur due to operational/ organisations reasons (locomotive/staff/direction change);
    - LMI:
      Possibility 1: Loading tracks/facilities designed for entire train length → no shunting within siding necessary;
      Possibility 2: Loading tracks and/or facilities shorter than train length → train splitting/composing within siding necessary, but normally to wagon sorting → respective tracks required
- Commodities/Industrial branches/Volumes: Principally no restrictions; actually high affinity to bulk like coal, coke, ore;
- Geographical occurrence: Everywhere;
- Types of Last-mile infrastructure (LMI): Private sidings;
- Sources: Entwicklung einer Methode zur Abschätzung des containerisierbaren Aufkommens im Einzelwagenverkehr und Optimierung der Produktionsstruktur (Bruckmann, 2006).

Figure 104 - Classic block train production system

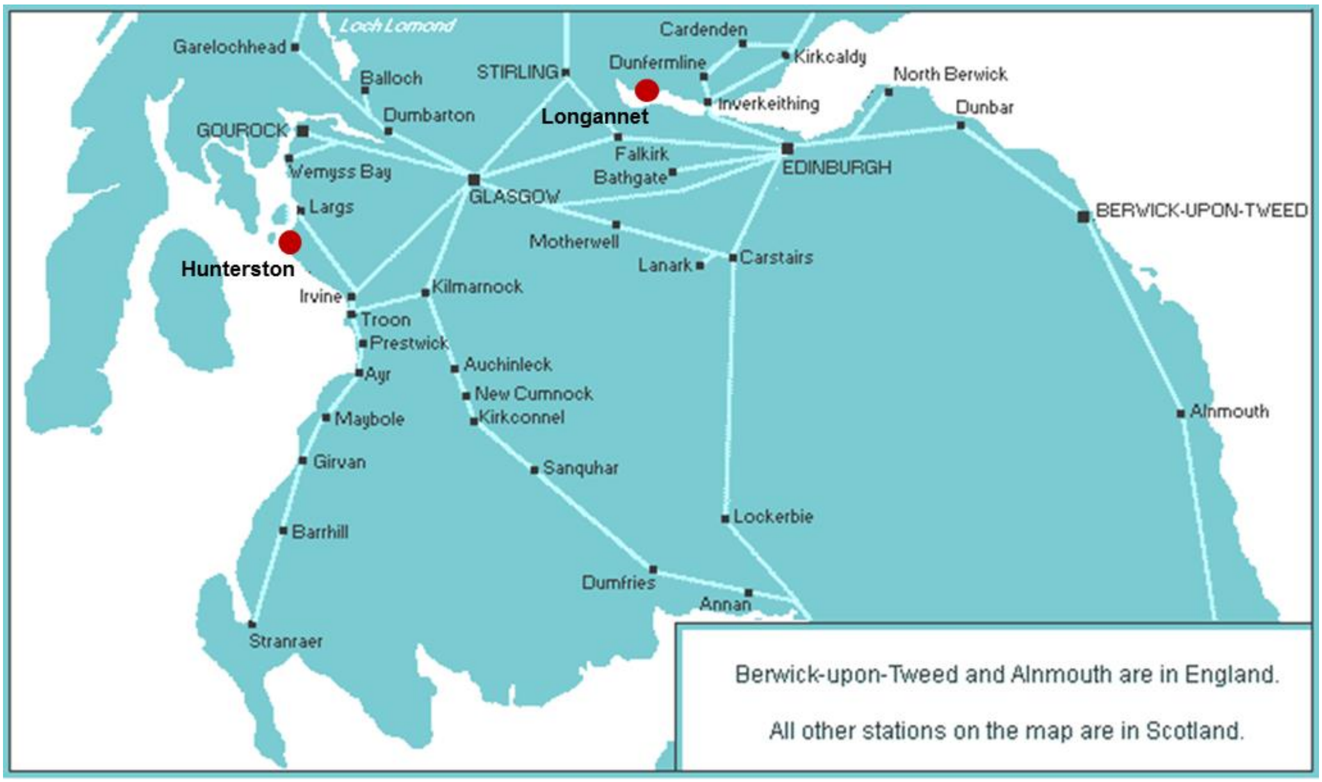


Source: HaCon

Block train case study 2: Coal supply by DB SR UK for ScottishPower

- DB Schenker Rail UK transports coal block trains for power plant operator ScottishPower from the seaport Hunterston at the Scottish west coast to the coal-fired power plant in Longannet at the east coast (see);
- Classical block train service, typical for the power plant industry and similarly used by other providers;
- Operational procedures: direct block train loaded from Hunterston to Longannet and empty vice versa;
- Geographical occurrence: Scotland (from Hunterston to Longannet), representative for coal power plant supply worldwide;
- Commodities/Industrial branches/Volumes: Coal, up to 4 Mio. t per year, 60 trains per week with each 1.610 t of coal;
- Types of Last-mile infrastructure (LMI): Private sidings, partially located in seaport;
- Sources: ScottishPower – Experience counts; http://www.rail.dbschenker.de/rail-deutschland-en/news_media/uebersicht_news/7991610/artikel2.html

Figure 105 - Locations of DB Schenker Rail UK coal service for ScottishPower



Source: www.edinphoto.org.uk/0_MAPS/0_map_railways_scotland_north.gif, edited by HaCon

Block train case study 3: Iron ore from Hamburg seaport to Salzgitter steel plant

- Iron ore supply for Salzgitter AG by Verkehrsbetriebe Peine-Salzgitter (VPS) and DB Schenker Rail;
- Special wagon sets with central buffer coupling enabling up to 5,400 t (gross) trainload;
- Operational procedures:
  - Long haul:
    1. Loading of wagon sets in Hamburg Hansaport;
    2. Train run Hamburg-Hansaport→ Salzgitter-Beddingen (transfer station), mostly double traction.
  - LMI:
    1. Take over block train by VPS diesel engines;
    2. Transfer to Salzgitter steel plant (storage area);
    3. Splitting up train into 5-wagon-groups for unloading (underground bunker).
  - Empty run back to Hamburg Hansaport
- Geographical occurrence: Hamburg - Salzgitter (Germany), representative for iron ore supply to steel plants worldwide;
- Commodities/Industrial branches/Volumes: Iron ore, 25,000 t/day;
- Types of Last-mile infrastructure (LMI): Private sidings, partially located in seaport;
- Sources: www.salzgitter-ag.com/de/presse/konzernmagazin/2014/konzernmagazin-201401.html?type=98

Figure 106 - Block train Hamburg-Salzgitter

Picture: HaCon

Figure 107 - Take over by VPS

Picture: Salzgitter AG

Figure 108 - Unloading wagon groups to underground bunker

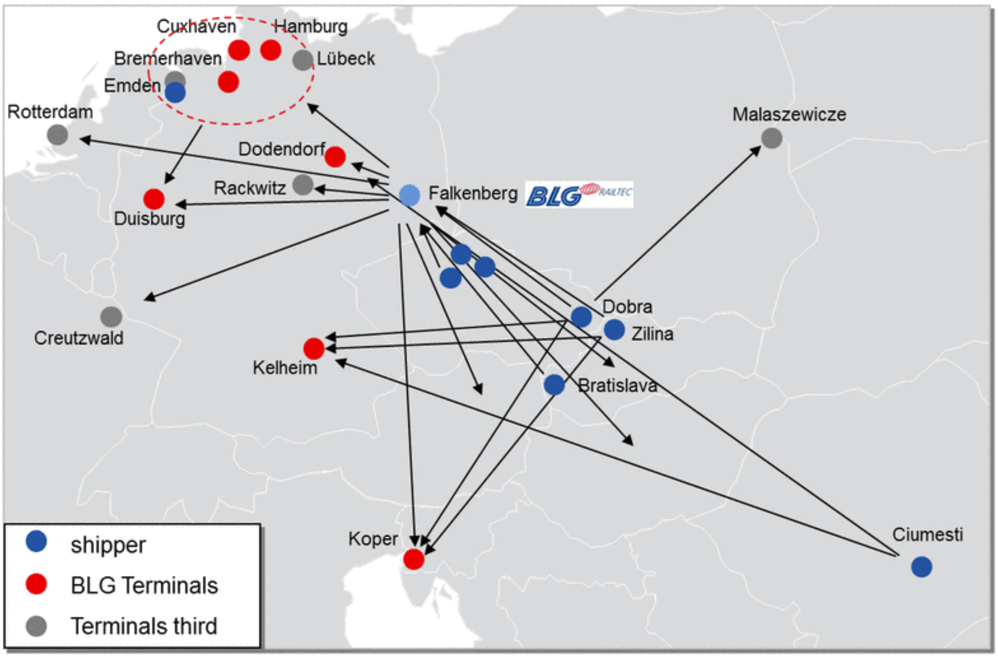
Picture: Salzgitter AG

Block train case study 4: Car transport by BLG AutoRail and partners

- BLG AutoRail network connects automotive industry primarily in Central/Eastern Europe with the seaports;
- Operational procedures: Mixed concept (see Figure 109), consisting of
  - Pure block trains and
  - Multi-destination-trains (same manufacturer, different destinations) via central rail hub Falkenberg (Elster). Here the trains are resorted according to the respective final destinations.
- Geographical occurrence (Hub system):
  - To Falkenberg from Bratislava, Slovakia (VW), Mlada Boleslav/Kvasiny, Tchech Republic (Skoda), Pitesti, Romania (Dacia);
  - From Falkenberg to Duisburg-Rheinhausen, Amersfoort (NL), Bremerhaven, Emden, Hamburg, Saal an der Donau
- Commodities/Industrial branches/Volumes: Automotive industry; 425.000 cars transported via rail (2012):

  Similar block train production systems (also via hub) are operated by e.g.:
  - DB SR subsidiary Transfesa and partners for Ford; mainly internal transports of vendor parts;
  - PCT Private Car Train GmbH (subsidiary of ARS Altmann) for BMW, mainly finished cars;
  - DB SR subsidiary ECR (Euro Cargo Rail) for Peugeot and Citroën; mainly finished cars;
  - Rail Cargo Austria and Hödlmayr for BMW, finished cars to Turkey;
- Types of last-mile infrastructure (LMI): Private sidings, partially located in inland ports/seaports;
- Sources: RailBusiness 19/2015, p 15, RailBusiness 43/2011, p 12ff; BLG homepage http://www.blg-autorail.de/en/dienstleistungen/netzwerk/; Press Release Hödlmayr International http://www.hoedlmayr.com/DE/unternehmen/presse/presseaussendungen/355.html)

Figure 109 - BLG Autorail network

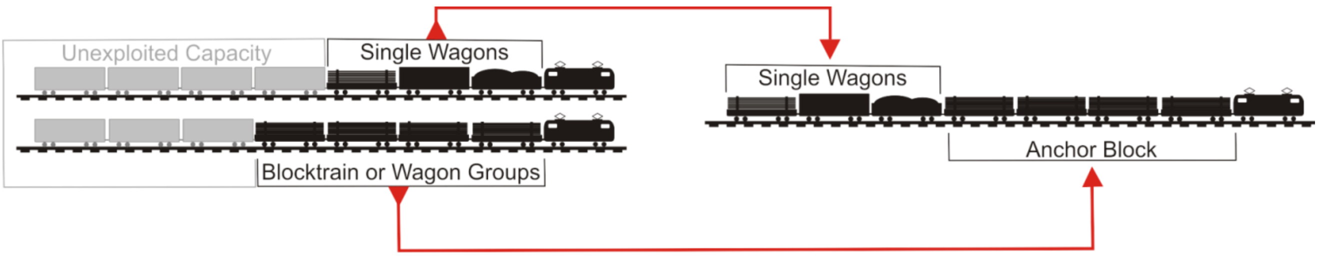


Source: BLG Autorail

Block train case study 5: Netzwerkbahn by DB Schenker Rail

- Netzwerkbahn is a mixture system of a block train and a single wagon production system designed to optimise exploitation of train load capacity as well as to reduce transport time and production costs (see Figure 110);
- The system requires large scale/long term dispatching/booking periods; customers submit their orders to DB Schenker Rail early - optimally one to two weeks in advance;
- Operational procedures:
  - Long haul: linking block train and single wagon load production networks: “anchor block” trains (continuous and large consignments from an important customer or multiple smaller transport volumes) are integrated into the schedule and all necessary resources are planned; till the day before departure, additional consignments (single wagons or wagon groups) can be added until the maximum train capacity (length or weight) is exploited; ideally, the trains are operated directly between customers’ transfer stations, bypassing shunting yards;
  - LMI: at transfer stations (delivery track, siding, railport) DBSR collects the wagons made available by the customer at a certain agreed time; if to be provided sorted → respective sorting/storage infrastructure necessary for single wagons to be attached to an “anchor block”, sufficient length of handover track to be considered.
- Geographical occurrence: Geographical service range of DBSR;
- Commodities/Industrial branches/Volumes: e.g. steel (ThyssenKrupp, ArcelorMittal), food (Mondelēz), others;
- Types of Last-mile infrastructure (LMI): Private sidings, railports, intermodal terminals;
- Sources: ViWas deliverable D4-1: Target Markets and KPIs; Railways 03/2013, p 22ff; Railways 04/2013, p 18ff; Railways 04/2014, p 28ff; Railways 01/2015 , p 42ff, DVZ 125/2012, p 5; ETR June 2013, p 10ff

Figure 110 - Principle scheme of Netzwerkbahn production system



3. Intermodal train production systems

Similar as single wagon transport, intermodal traffic show numerous operational variants as well. A profound collection and structuring of the most common production system is compiled in the following two studies:

- “Recommendations for sizing, dimensioning and design of modern intermodal terminals (terminal handbook)”; HaCon/KombiConsult, 2012;
- “Development concept for intermodal transport 2025 in Germany”; HaCon/KombiConsult, 2012.

The general descriptions of the intermodal transport systems generally refer to these two studies, if not indicated otherwise.

As a first rough diversification, intermodal production system can be broken down into two main categories:

1. Full-trainload (FTL) intermodal systems and
2. Less-than-trainload (LTL) intermodal systems

Full-trainload (FTL) intermodal systems

- are designed for top-level services (transport time, frequency, closing/provision time) with minimum operational effort;
- require sufficient volume for dedicated trains between each two terminals;
- do not require rail bound bundling processes.

The main representatives of this category are direct and shuttle train systems. As Table 62 shows, the main operation principle is a non-stop service between each two terminals with unchanged wagon/loading configuration. As a further specification, shuttle trains run with fixed wagon sets in both directions. Today, the majority of all intermodal volumes in Europe is operated with FTL systems.

Table 62 - Overview on Full-trainload intermodal systems

Production system	Specific operational procedures *	(Geographical) occurrence	Markets/ volumes	LMI types
1. Direct trains	Non-stop train run between two terminals with unchanged wagon/ loading configuration	Everywhere Most commonly used intermodal production system	All intermodal market segments	Intermodal terminals
2. Shuttle trains	Non-stop train shuttle between two terminals and vice versa with unchanged wagon load and fixed wagon sets	Mainly between large economic agglomerations with continuous and balanced volumes flows	Due to volume fluctuations (weekdays) only rarely used in hinterland transport from/ to the seaports	Intermodal terminals

* Operational processes that apply to all forms of intermodal production systems are not listed here. These are e.g. train splitting/ composing according to length of transhipment tracks, replacement of damaged wagons, shunting movements between in-/outbound tracks and transhipment tracks, shunting movements due to floating procedure; see also chapter 4.3.3.2.3

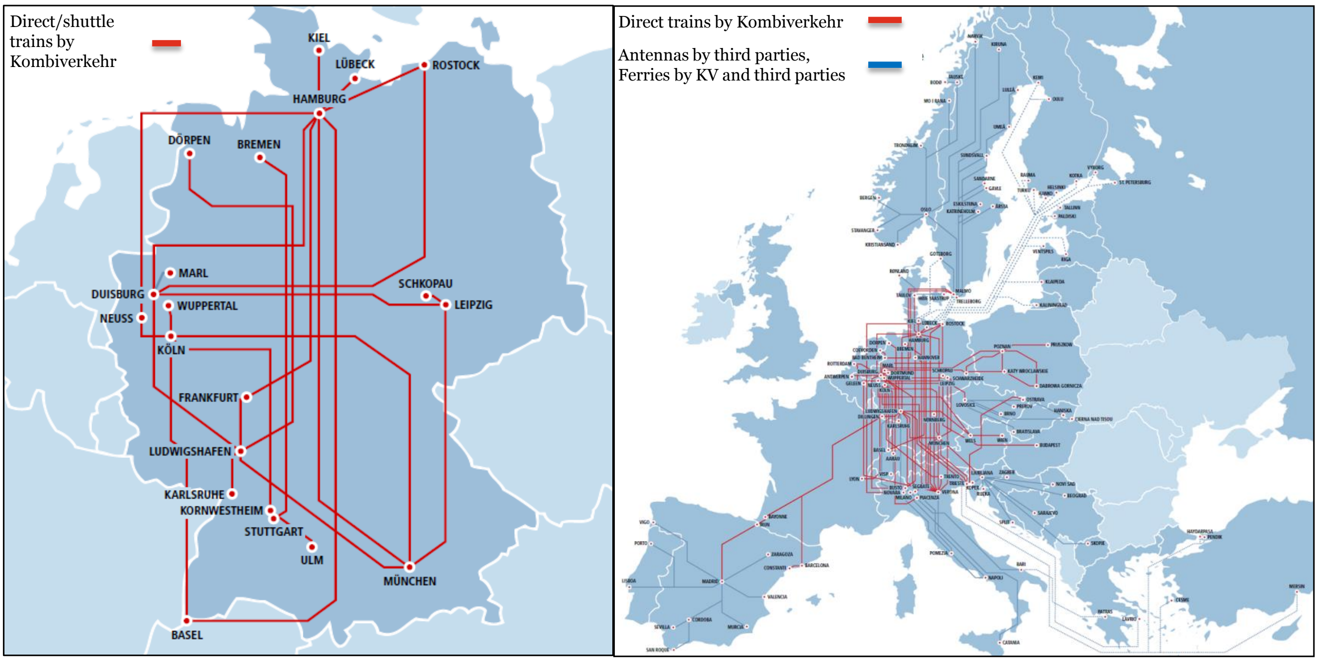
Source: HaCon/KombiConsult

Some trends concerning the last mile infrastructure using direct and shuttle intermodal trains are:

- Increased need for train parking to guarantee high utilisation as trains do not stay on transhipment track during whole terminal stay, either sidings within the terminal or transfer stations nearby (floating procedure, see below);
- Increased need for loading unit storage areas for the same reason and because there are more and more semi-trailer in use which are not stackable;
- Multiple shuttle services on destinations with high demand (round-trips) require particularly short durations-of-stay inside the terminal. This reduces the available time slots for direct rail/road transhipments and therefore leads to additional need for loading unit storage capacities, while sidings for train parking become less important.

Direct and shuttle train systems are used by various big players in the intermodal sector. As an example, Figure 111 shows the direct/shuttle train system of Kombiverkehr. Similar networks are provided e.g. by Hupac or TX Logistik.

Figure 111 - Intermodal case study 1: Kombiverkehr direct/shuttle train network



Source: Kombiverkehr

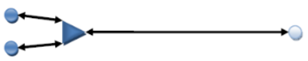
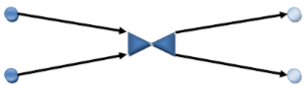
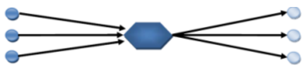
In contrast to these production concepts, <u>Less-than-trainload (LTL) intermodal systems</u>

- are designed for incorporation of destinations below FTL volumes into high-level intermodal services;
- are often used by service providers when entering new markets in order to reduce economic risks;
- require bundling processes.

This bundling of loading units can be performed either by

- Train operation/shunting (Y-Shuttles, Group trains, Hub systems, Liner trains), see Table 63, or by
- Train/train transhipment of loading units (Gateway systems, MegaHub systems), see
- Table 64.

Table 63 - Overview on LTL intermodal systems with bundling by shunting

Production system	Specific operational procedures *	(Geographical) occurrence	Markets/ volumes	LMI types
3. Y-Shuttle 	Connection of wagon groups from 2 origins for 1 destination (shunting) or splitting up 1 origin to 2 destinations (shunting)	Everywhere	All intermodal market segments	Intermodal terminals
4. Group trains 	Exchange of 2-3 terminal dedicated wagon groups between 2-3 trains (shunting, often performed by line engines → lean shunting concept)	Often used in seaport services (connecting several terminals in one port with several hinterland destinations)	Primarily maritime volumes, continental company networks	Intermodal terminals Private sidings Railports
5. Hub systems 	(Complete) resorting of wagon (groups) according to connected destinations (shunting, often performed in dedicated shunting yards → extended shunting concept)	Often used in seaport services (connecting many terminals in several port with numerous hinterland destinations)	Primarily maritime transports	Intermodal terminals
6. Liner trains 	Service of intermediate terminals a.) by shunting (sorting out/in wagon groups in transfer station of the intermediate terminals b.) by transhipment (without shunting)	Often used to incorporate mid-size terminals	Applicable to all intermodal market segments	Intermodal terminals Railports

* Operational processes that apply to all forms of intermodal production systems are not listed here. These are e.g. train splitting/ composing according to length of transhipment tracks, replacement of damaged wagons, shunting movements between in-/outbound tracks and transhipment tracks, shunting movements due to floating procedure; see also chapter 4.3.3.2.3

Source: HaCon/KombiConsult

Y-shuttle trains mean either connecting of two train groups with the same destination or splitting up a train into two wagon groups heading for different destinations. The latter case requires an adequate sorting of the wagons in the origin terminal in order to avoid splitting up single wagons. This concept is often applied when one big economic centre is connected to mid-size economic regions. A sample use case is the hinterland transport system of Baltic train, connection the Germany North Sea ports Hamburg and Bremerhaven with Göttingen and Philippsthal (see Figure 112). This system combines a Y-Shuttle northwards with a liner train (intermediate stop in Göttingen) southwards.

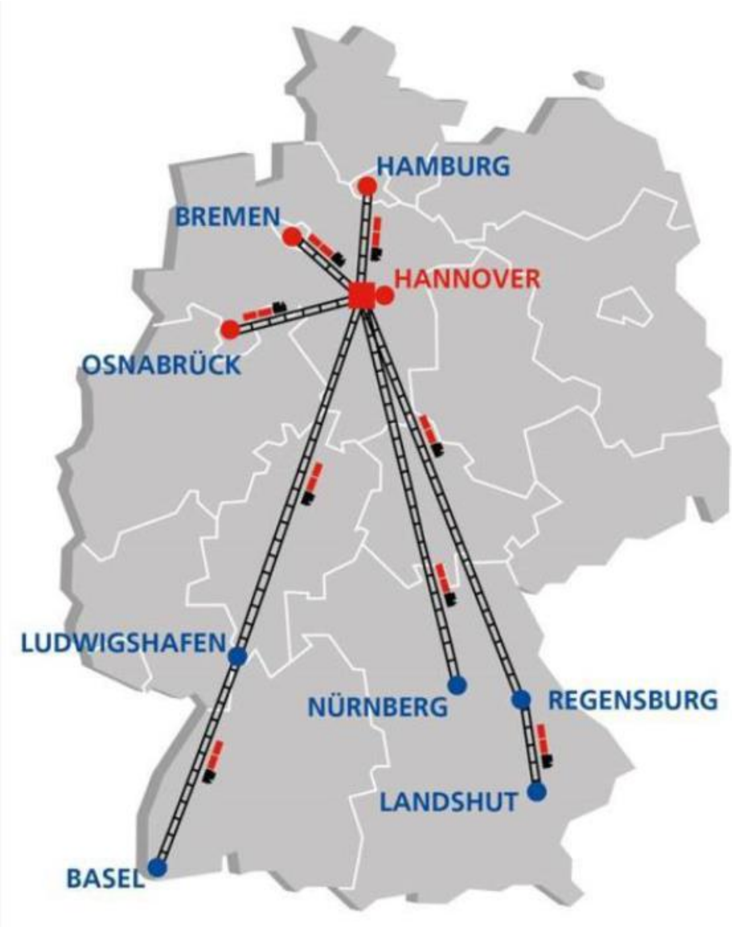
Figure 112 - Intermodal case study 2: Y-Shuttle/Liner train system by Baltic train

Source: K+S Transport GmbH

Group trains exchange few (mostly 2-3) wagon groups in dedicated intermediate stations. As the incorporated trains usually arrive at the same time, the intermediate station must provide a respective number of tracks capable for the entire trains. The shunting operation is normally performed by the line locomotives and comprises only the exchange of dedicated wagon groups, but not the split-up of the complete trains. This procedure is also entitled as "lean shunting concept" as a contrast to the hub systems (see below). As a necessary prerequisite, the wagon groups on all included trains must be in a dedicated order.

An example for group train systems, the "Rail solution" concept by Hellmann forwarding company is shown in Figure 113. It is a domestic transport system dedicated for time-critical cargo, established by Hellmann in 2004 (but open service). The concept is based on connecting dedicated destinations in Germany by wagon group exchange in Hannover. Moreover, the group system is connected to international destinations via gateways in Ludwigshafen, Basel and Nurnberg. It is also an example for incorporation of private sidings in intermodal transport concepts (Hellmann facility in Osnabruck).

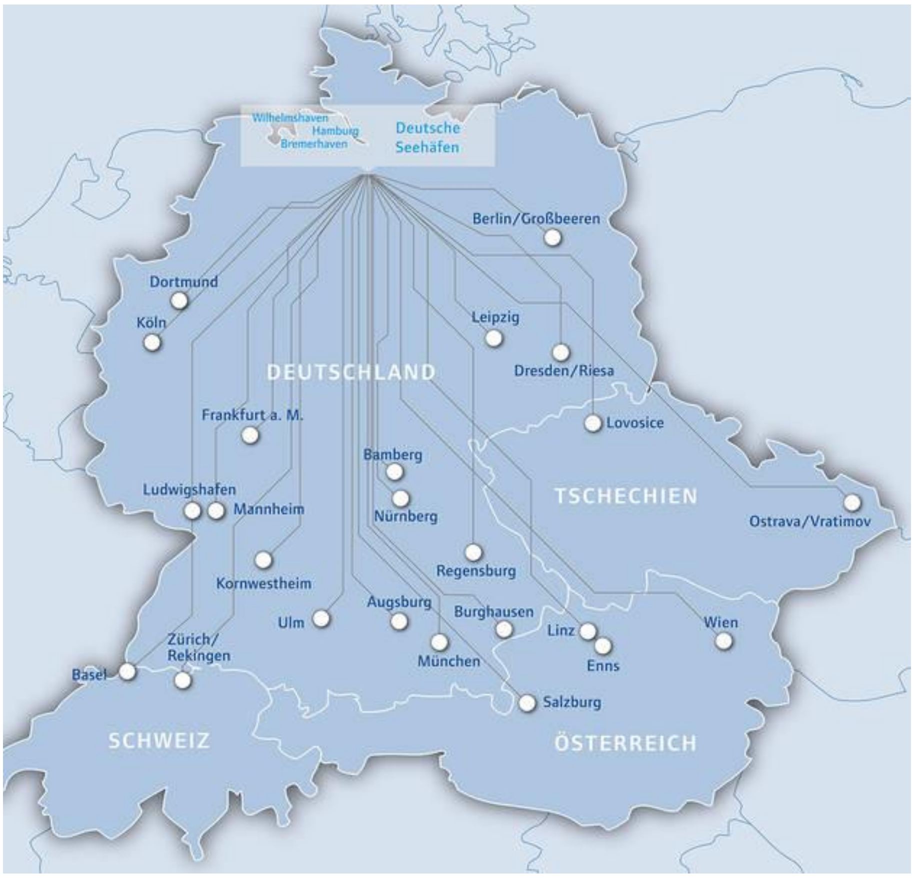
Figure 113 - Intermodal case study 3: Group train/Gateway system "Rail Solution" by Hellmann



Source: Hellmann

A <u>hub system</u> is designed for the connection of multiple trains. Within a hub, changes of several terminal specific wagon groups between trains are realised, even of single wagons; it is therefore an “extended shunting concept”. This requires substantial infrastructure capacities in the hub dedicated to train splitting and composing. For this reason, also shunting yards of single wagon networks can be used as a hub for intermodal trains. Exemplarily, this is the case in the “AlbatrossExpress” hinterland network by Transfracht, using shunting yard Maschen (Hamburg) as distribution centre to the German North Sea ports and to hinterland destinations (see Figure 114).

Figure 114 - Intermodal case study 4: Hub system “AlbatrossExpress” by Transfracht



Source: Transfracht

<u>Liner trains</u> serve one or more intermediate terminals along the train run. Conventionally, wagon groups are coupled or uncoupled to/from the train (see Figure 112). In order to minimise time loss, wagon groups to be disconnected must be sorted in order of the intermediate stops. Wagon groups to be added might simply be coupled to the rear of the liner train, if they are dedicated to the terminus of the train run. If, in contrast, the destination is another intermediate stop, the wagon groups must be sorted into the correct order in the train. This might require considerable shunting effort and infrastructure for wagon sorting in the transfer station of the intermediate terminals.

Alternatively, the exchange of loading units in the intermediate terminal might be performed by transhipment and not by shunting. This means that the liner train enters and departs to/from the transhipment track directly. Thus, the transhipment tracks must have a direct, two-sided connection to the main line. Furthermore, the usable length of the transhipment tracks must be capable for the maximum expected liner train length plus security surcharges in front of and behind the signal.

From the operational side, the liner train enters the intermediate terminal with momentum, if conventional, horizontal transhipment technique is used (see MegaHub concept). Another option is to implement horizontal transhipment devices, which cause no conflict with the catenary.

Table 64 - Overview on LTL intermodal systems with bundling by rail/rail transhipment

Production system	Specific operational procedures *	(Geographical) occurrence	Markets/ volumes	LMI types
7. Gateway systems	Gateway terminals = Last-mile terminals + bundling facilities All trains start/terminate in the terminal, complete (un)loading of trains Transfer of LU between trains by rail/rail transhipment (mostly non-direct) + rail/road transhipment (Last-mile) Normal case: Staggered arrival/departure of connected trains	Connection of international with domestic networks Integration of smaller terminals and private sidings by feeder trains	All intermodal market segments	Intermodal terminals Private sidings Railports
8. MegaHub systems	Expansion of Gateway concept: Through-going trains → entry with momentum, partial un(loading) of trains Normal case: Simultaneous arrival of trains with LU for several destinations Resorting of LU by rail/rail transhipment (mostly direct) → dedicated trains + Rail/road transhipment (Last-mile)	Pilot applications planned in Duisburg and Hannover-Lehrte (Germany)	All intermodal market segments	Intermodal terminals

* Operational processes that apply to all forms of intermodal production systems are not listed here. These are e.g. train splitting/ composing according to length of transhipment tracks, replacement of damaged wagons, shunting movements between in-/outbound tracks and transhipment tracks, shunting movements due to floating procedure; see also chapter 4.3.3.2.3

Source: HaCon/KombiConsult

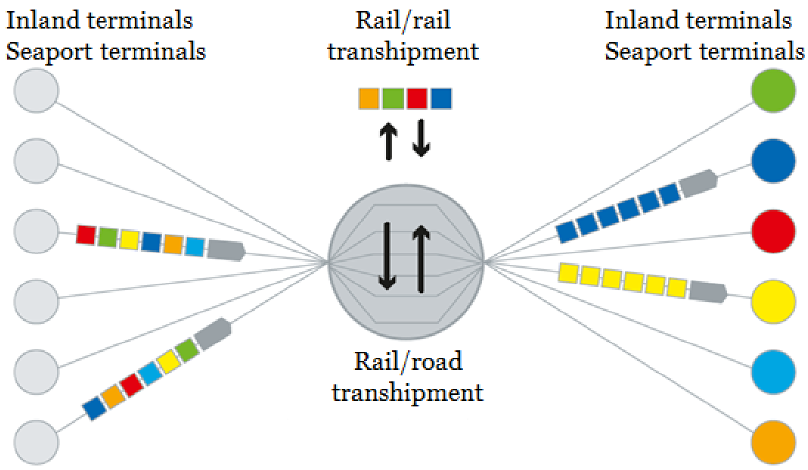
Gateway terminals combine last-mile and loading bundling functions. Bundling is performed by loading unit transhipment between the connected trains (without shunting). In addition, rail/road transhipment is offered as last-mile service as well. In most cases, not all trains will reach the gateway terminal at the same time. Thus, infrastructure for train and/or loading unit buffering is required to realise transfer of loading units.

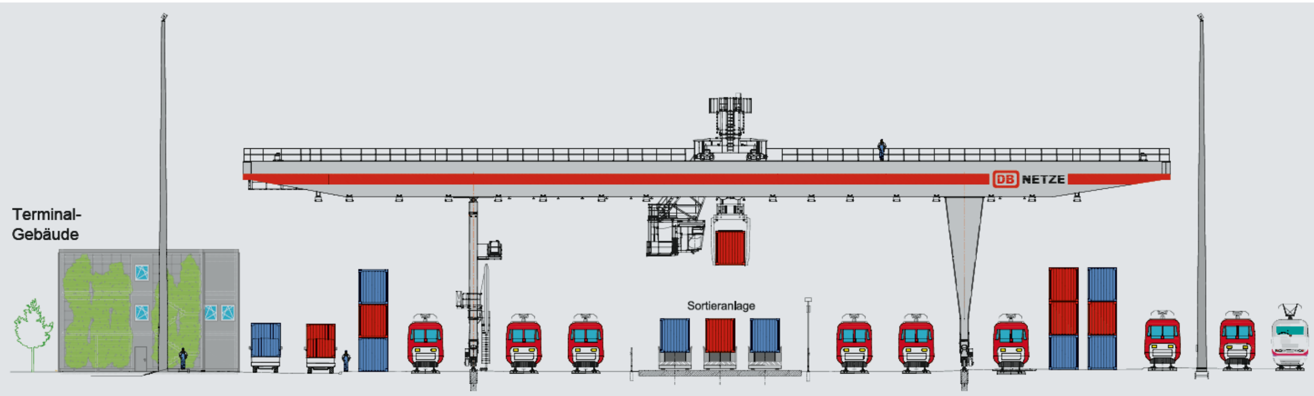
In contrast to MegaHub systems, all trains terminate in the gateway terminal and are unloaded (and reloaded) completely. These are long-haul destinations as well as feeder trains to/from smaller terminals. An example for a gateway system is provided in Figure 111 and shows an international connecting with a domestic network.

The MegaHub concept represents an extension of the gateway system. It consists of through-going trains that arrive within the same time-window and exchange their loading units amongst each other (mostly direct transfer without intermediate storage). Thus, arrival trains have loading units for several destinations, departure trains only for one destination. This transhipment concept requires a higher number of loading tracks in order to serve all connected trains simultaneously. Outside the slots for train/train transhipment, MegaHubs also allow for rail/road transhipment (last-mile).

From the rail operation view, MegaHub concepts are based on liner train systems entering the terminal with momentum and leaving directly from the transhipment tracks. Figure 115 shows the rail production system and the terminal layout of the planned MegaHub Hannover-Lehrte that shall be put into operation within the next years.

Figure 115 - Intermodal case study 5: MegaHub Hannover-Lehrte





Source: DB Netze

Additionally to the long-haul determined production concepts shown above, rail operation procedures inside the terminal have a particular influence on the required last-mile infrastructure. This firstly concerns the way trains enter and leave the terminal:

- The "conventional" layout, which represents the majority of existing intermodal terminals, distinguishes dedicated infrastructure and processes for train in-/outbound and for transhipment (see Figure 116):

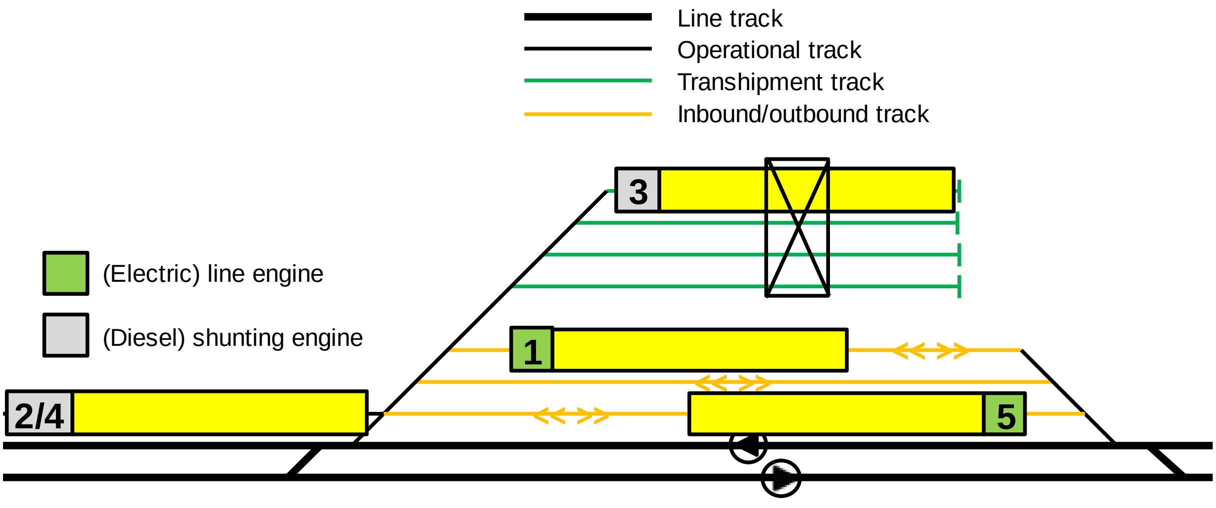
  The arrival and departure of the trains take place in dedicated in-/outbound tracks (1). These are usually electrified and show a two-sided connection to the main line.

  In most cases the transhipment tracks are connected only by one-side to the in-/outbound tracks. As far as vertical transhipment technology is used (gantry/mobile cranes), the tracks are not electrified along the transhipment area. For the rail processes this means that a shunting movement is needed between the inbound and the transhipment track (2). This is normally performed by a (diesel) shunting engine, but might also be realised by the line locomotive, the latter requiring electrification until the beginning of the crane runway. In any case, a turnout track is needed for this purpose.

  After finalising transhipment (3), processes are performed accordingly vice versa to the arrival side: The wagons are transferred to the outbound track (4) where the train departure takes place (5).

  Alternatively, trains might leave the terminal directly from the transhipment tracks, if electrification begins right behind the crane runway and if the direction of the long-haul train run corresponds with the connection side of the transhipment tracks (in the example below, direct departure is possible only to the left);

Figure 116 - "Conventional" terminal layout and associated rail processes

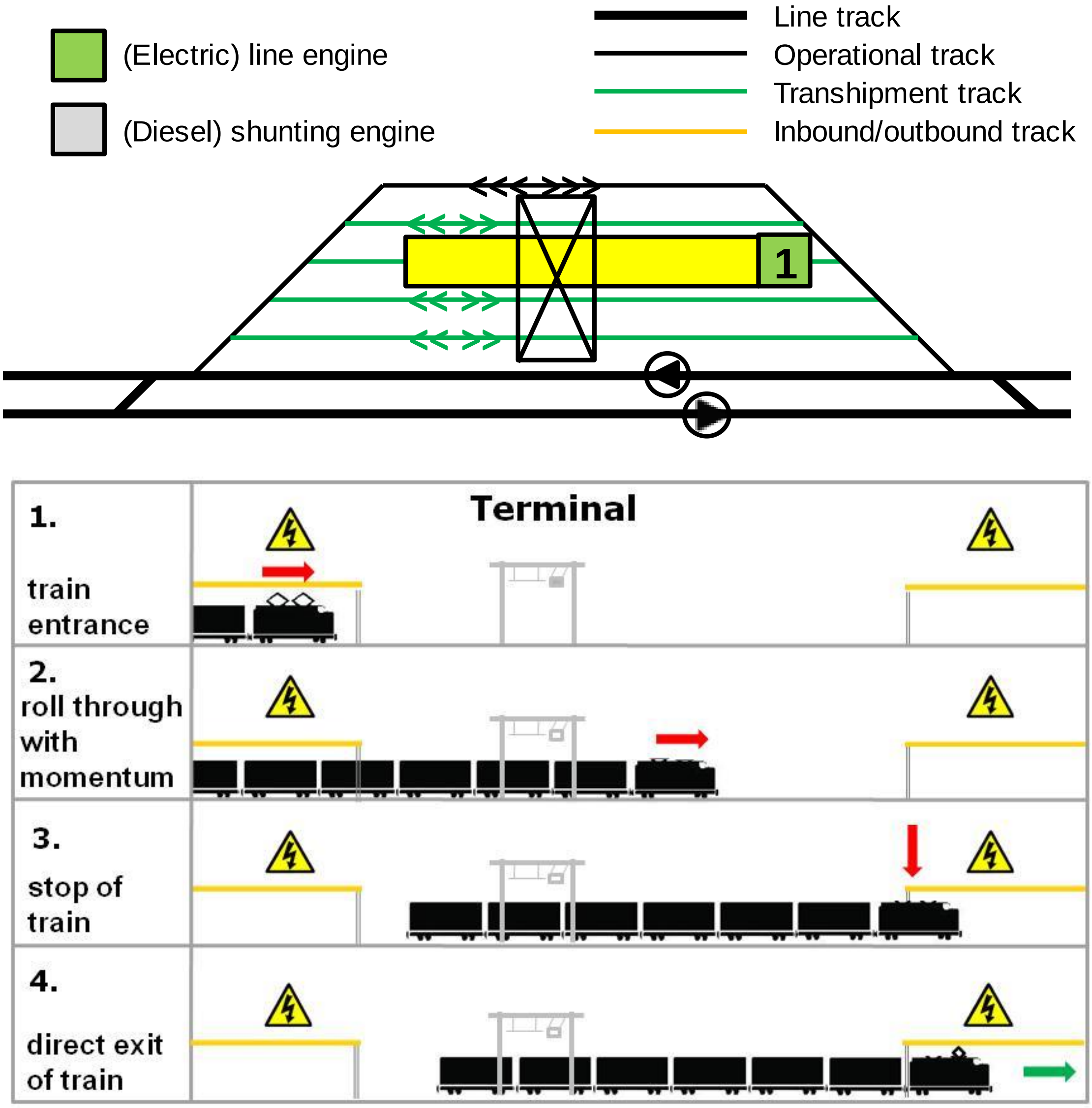


Source: HaCon

- The "innovative" layout combines infrastructure for in-/outbound and for transhipment (see Figure 117). Trains enter the transhipment tracks directly from the line "by momentum". This means that the locomotive driver pulls down the pantograph before reaching the crane runway, moves powerless along the transhipment area (under the crane) and re-activates the pantograph behind the crane runway. Thus, trains will leave the terminal directly from the transhipment tracks.

  Compared to the "conventional" layout, the "innovative" configuration principally demands neither dedicated in-/outbound tracks nor turnout tracks to reach the transhipment area. However, the transhipment tracks must show a usable length capable for entire trains. They also need a both-side connection to the main line and a both-side electrification outside the crane runway. Furthermore, the transhipment tracks become main tracks; this means that they must be connected to the signalling system und fulfil all requirements of the respective train operating regulations. Additionally, an operation track is required to allow for locomotive tuning (shuttle trains).

Figure 117 - "Innovative" terminal layout and associated rail processes

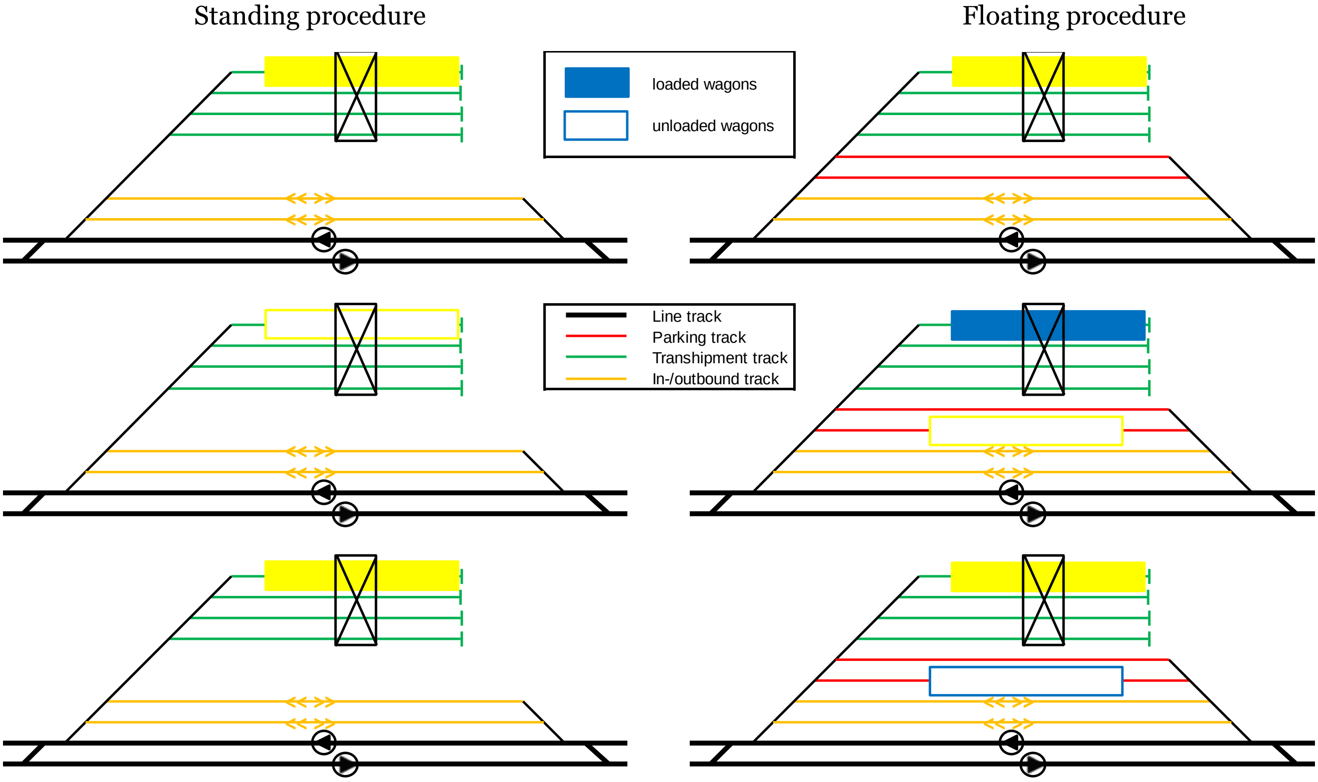


Source: HaCon

The rail layout configuration as described above does not consider infrastructure dedicated to (regular) parking/ buffering of wagons. The demand for such infrastructure mainly depends on the operation principle of the transhipment area – standing or floating procedure (see Figure 118).

- When performing standing procedure, the wagon set stays in the transhipment track during unloading and subsequent reloading. This one hand favours indicators regarding operational effort (high share of direct rail/road transhipments and thus less crane movements per loading unit, no intermediate shunting movements) and infrastructure (less demand for intermediate storage, no parking tracks). On the other side, the occupancy rate of the transhipment is only low, limiting the throughput of the terminal;
- For this reason, floating procedure is practised to increase the performance of the terminal. Inbound wagon sets are unloaded completely (mostly indirect transhipments to intermediate storage); the empty wagons are moved to a parking track and returned to the transhipment track at a later stage for reloading. Thus, the capacity of the transhipment tracks/facilities can be exploited to a higher degree. However, this enhanced capacity is gained by additional operational effort (more lifts per loading unit, more sorting transhipments, additional shunting processes from/to the parking tracks) and by the need for additional resources (crane capacity, intermediate storage, parking tracks).

Figure 118 - Principle of standing and floating procedure



Source: HaCon

Annex J – Technical developments for innovative last-mile services

1. Bimodal vehicles

For companies with lower rail freight transport volumes, in particular those who operate a shunting locomotive this is often not a cost efficient approach. An alternative are road vehicles, as these machines can also be used for other purposes in addition to shunting operation. Mostly, the basic use case is a common road vehicle coming from the normal production line which is afterwards equipped with special technical attachments which are necessary for rail operation ("converted vehicle"). As a base platform for road-rail vehicles often so-called "Unimog[86]" are used, but there are also further types of suitable vehicles. Other manufacturers, however, have developed designs which are specifically constructed for the requirements of shunting services ("dedicated" vehicle). Today, also "unmanned" bimodal shunting vehicles are in operation (Figure 119).

Figure 119 - Types of bi-modal vehicles

Type of vehicle	Example	Specifics
Converted rail-road vehicle	 Source: Eisenbahntechnische Rundschau 3/201313	• Towing capacity: up to 1,000 t • Flexible use (also for towing of road trailer) • Road operation possible • Rail-guided propulsion
Dedicated rail-road vehicle	 Source: www.zwiehoff.de	• Towing capacity: up to 4,000 t • No operation on public roads • Rail-guided propulsion
Unmanned shunting vehicle	 Source: www.zwiehoff.de	• Towing capacity: 500 t • No operation on public roads • Rail-guided propulsion

[86] Brand-name of the Daimler AG (Mercedes Benz)

In general, for bimodal vehicles there are two different types of propulsion for driving on rails:

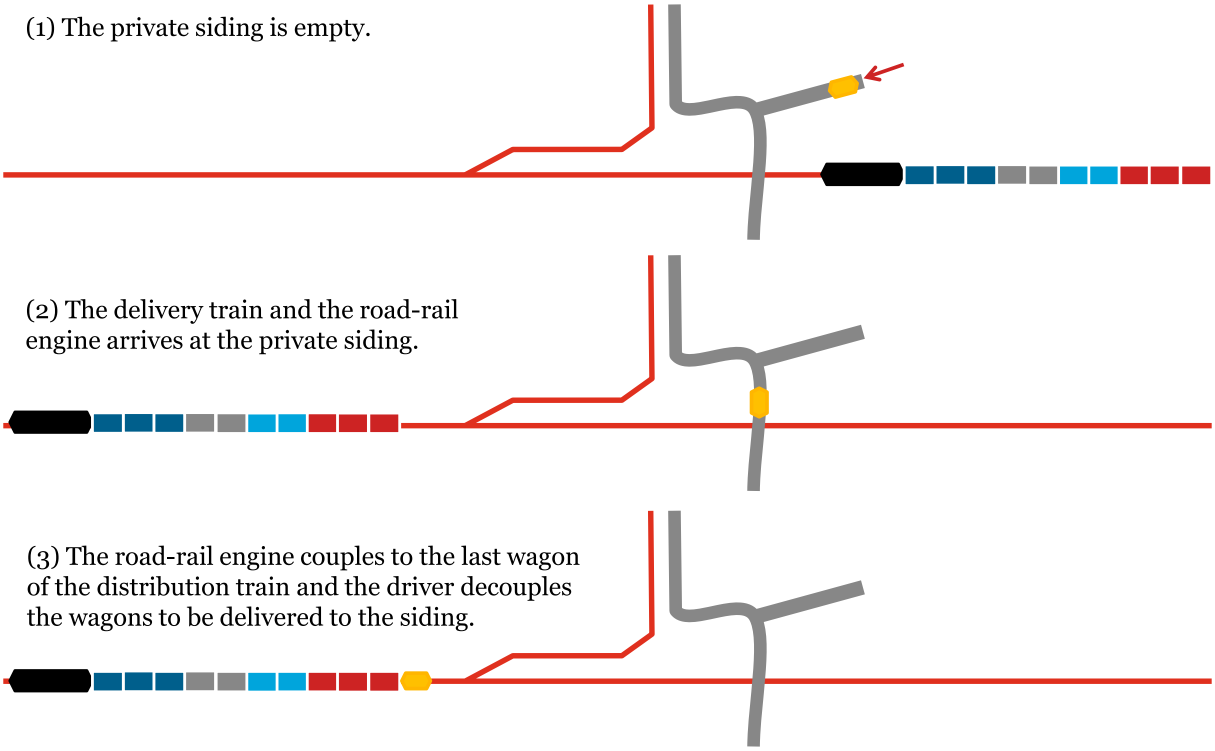
- **Rail guided technologies**: the force is transmitted via the tires to the rail. Depending on the load of the vehicle, the tire wear is relatively high. In order to remain the car on the rail tracks, additional track guide rollers are mounted;
- **Rail vehicle function**: the propulsion power is transmitted through additional flanges provided with wheels.

Within the ViWaS project[87], which focusses on the optimisation of single wagonload transport in Europe, a test of an extended operation of bimodal vehicles on the rail infrastructure of the project partner SNCF Fret in France was carried out. The test evaluated the feasibility of a deeper integration of these vehicles into last-mile distribution and collection runs of trains serving siding with lower traffic volumes. By avoiding the use of shunting locos for the distribution or collection of single wagons or wagon groups on the last-mile, cost savings (estimated value: 25 to 40% on the overall transport costs) and the reduction of transport time shall be achieved to raise the competiveness of rail transport.

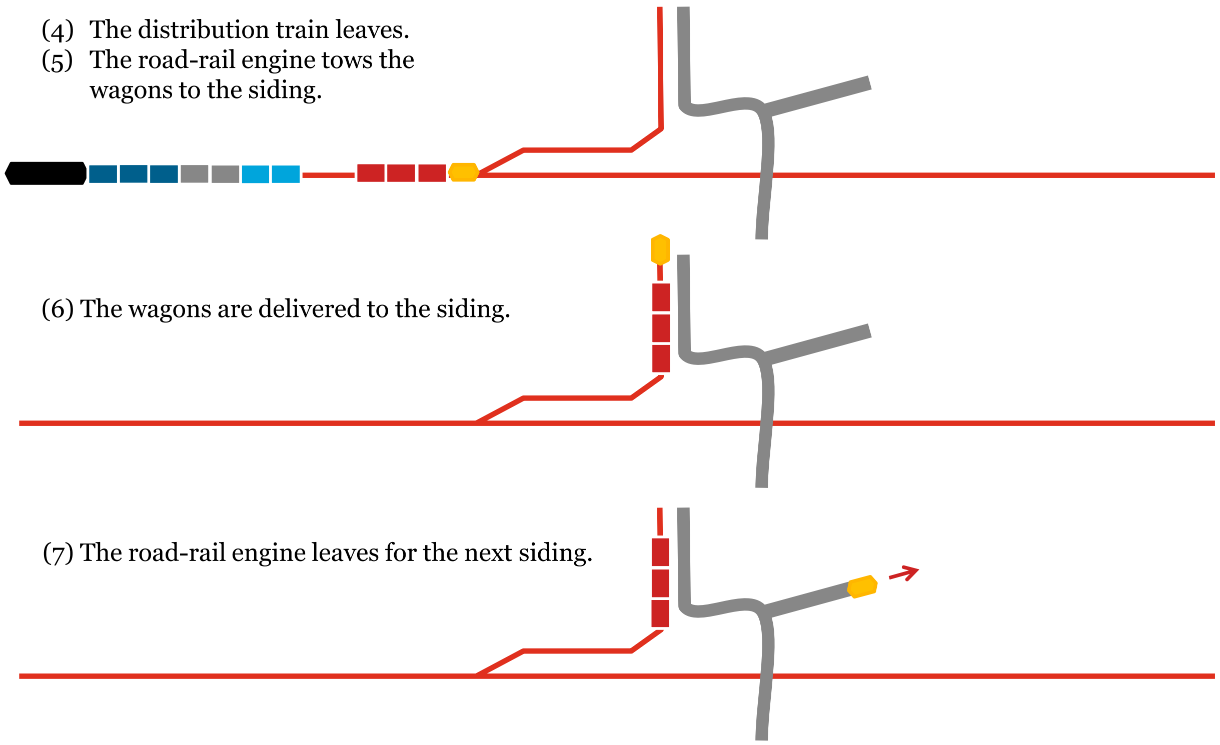
Initially, for the ViWaS project two concepts have been designed for operation of bimodal vehicles:

- In the first concept, a road-rail vehicle should be attached to the train serving the last-mile infrastructure. After decoupling a set of wagons to be delivered, the bimodal vehicle hauls them into the siding. During this time, the train continues its run towards the next stop where another set of wagons has to be delivered. The road-rail vehicle joins the train by road after its delivery, re-entering on the tracks at a level crossing (see Figure 120);
- The second concept considers a road-rail vehicle belonging to the receiver's facilities and is used to move rail wagons inside the respective industrial area.

Figure 120 - Process chain for the operation of bi-modal vehicles in the ViWaS project



[87] RTD project ViWaS: ViWaS stand for "Viable Wagonload production Schemes" and is funded under the Seventh Framework Programme (FP 7) of the European Commission.



The current ViWaS project status can be summarised as follows: As described above, for the first option it was planned that the bimodal vehicle will connect the public rail network and private sidings. Even for the relatively short movement on public tracks, the involved French infrastructure manager was demanding an exceptional permission for operation the bimodal vehicle on the public rail infrastructure. It was not possible to achieve an agreement with the French railway authority on the exceptional permission, even for testing purposes. The application process for an agreement on operation rules would have taken significant additional time efforts.

Therefore, it was decided to concentrate the tests on an area that does not require the usage of public tracks, but is at the same time identical in the operating conditions compared to the initially selected test case. This specific configuration was found in a private siding located at a freight terminal in the Lyon area and operated under the responsibility of the project partner SNCF Fret.

2. Last-mile hybrid locomotives

Another option for the improvement of wagon delivery on last-mile rail infrastructure is the operation of so-called “hybrid locomotives”. In general, “hybrid”[88] is a wider definition for various combinations of dual propulsion techniques for locomotives. These engines are able to run with both, with electricity or diesel engines. The common variants are:

- Line locomotives with electric propulsion and an additional auxiliary diesel-engine for serving the “last-mile”;
- Line locomotives with a “dual” propulsion: electric engine and diesel-motor;
- Shunting locomotives with an energy storage module (battery pack).

Thus, they can haul wagon trains without a change of locomotive directly into non-electrified tracks in sidings, railports or terminals. The cost and time consuming change from an electric liner locomotive to a diesel-powered shunting locomotive can be avoided. Beside the economic effects, the use of hybrid locomotives offers additional potentials for the reduction of noise and emissions. For this report, the combination of electric and diesel engine will be described. As an example, two types of hybrid locomotive are described below:

1. Locomotive type Eem 923

[88] In the context of the report, all locomotives with dual propulsion are called “hybrid locomotives”

In 2011, the Swiss railway company SBB Cargo has ordered some 30 hybrid locomotives of the type "Eem 923" built by the domestic manufacturer Stadler. SBB also secured options on additional vehicles, which can be redeemed in the upcoming years, if necessary. The vehicles ordered are in operation since January 2014 and operating successfully light- and medium-duty shunting operations as well as mainline service.

The Eem 923 is equipped with an electric engine and a diesel generator set for operating on non-electrified lines. The engines offer a maximum starting tractive power of 150 kN (both in electric and diesel mode) and maximum power at the wheel of 1,472 MW in electric mode. In diesel mode, the maximum power at the wheel is 290 KW. The fuel tank has a capacity of around 1,000 litres. The maximum speed of 120 km/h (electric mode) helps to secure train paths on the very busy Swiss network. The Eem 923 currently is only approved for use in Switzerland, but operation abroad in its current configuration is also conceivable. However, this only makes sense if the destinations are connected by long stretches of electrified line, as the maximum speed of the engine is limited to 20 km/h in diesel mode (2,000 tonnes wagon train weight) and thus is not suitable for longer mainline services in this propulsion mode. The technical data and a sketch of the locomotive are displayed in Table 65 and Figure 121.

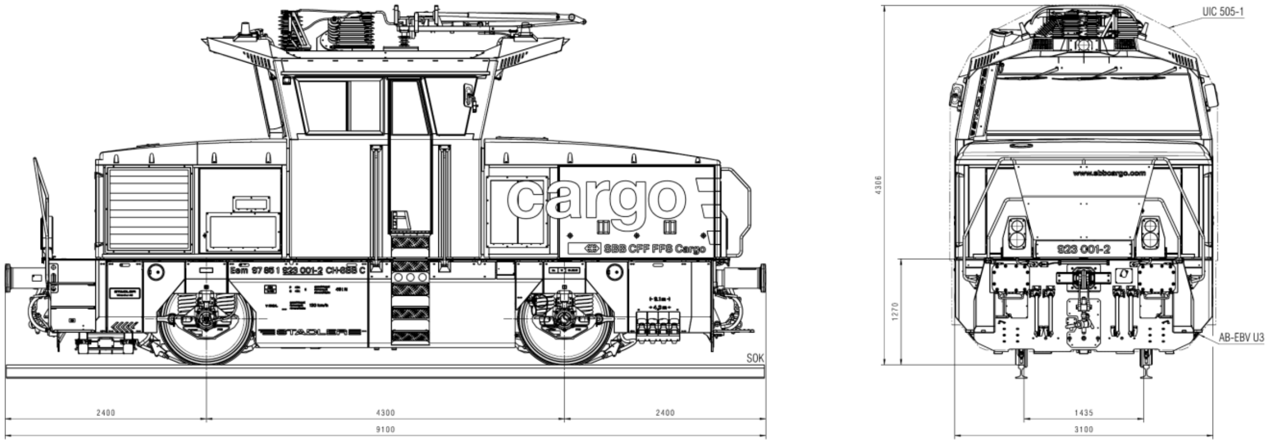
As already mentioned, the Eem 923 is well-suited to relatively light trains on routes with low gradients, but not to heavy loads on routes with steep gradients.

Table 65 - Locomotive type Eem 923 (hybrid locomotive) – technical data

Technical data Eem 923 Hybrid Locomotive	
Manufacturer	Stadler
Type	Eem 2/2 "Butler"
Series	Eem 923
1. propulsion	electric
2. propulsion	diesel
Power supply voltage	AC 15 kV/16,7 Hz
	AC 25kV/50 Hz
Bogie placement	Bo
Max. axle load	(22,5 t)
Service weight	45 t (SBB Cargo)
Max. speed	120 km/h (electric mode)
Length over buffer	9.10 m
Max. performance	1,500 kW (on wheel)
Max. starting tractive power	150 kN
Diesel motor	290 kW
Max. starting tractive effort "last-mile"	
Diesel: Performance on wheel	290 kW
Fuel tank	1,000 l diesel
"Last-mile": max. speed	2,000 tonnes-train: ca. 40 km/h
Diesel: cruising range	n/a
Remote control	yes

Source: SBB Cargo

Figure 121 - Locomotive type Eem 923 - sketch



Source: SBB Cargo

2. Bombardier Traxx F14 AC "Last-Mile"

In comparison, the Traxx F140 AC manufactured by Bombardier is a heavy line locomotive with an electric driven engine and an additional diesel generator set (see Table 66). Due to the generated electricity, this diesel generator set allows for an operation on both electrified and non-electrified track sections.

The engine has a maximum starting tractive effort of 300kN with a maximum performance of 5.6 MW and has a length over buffer of 18.9m, a width of 2.98m and a height of 4.28m. The maximum speed is at 140 km/h; in diesel-mode the speed is limited to a maximum of 40km/h at a load of 2,000 tonnes.

The diesel generator set owns a 400 litres fuel tank, ensures a wheel performance of 180kN and has the emission Stage IIIB[89]. For the diesel-electric operation, the engine allows a maximum speed of 25 km/h.

Table 66 - Bombardier Traxx 140 Last-Mile – technical data

Technical data Bombardier Traxx 140 Last-Mile	
Manufacturer	Bombardier
Type	Traxx F140 AC3 "Last Mile"
Series	187
1. propulsion	electric
2. propulsion	diesel
Power supply voltage	AC 15 kV/16,7 Hz
	AC 25kV/50 Hz
Bogie placement	Bo'Bo'
Max. axle load	22 t
Service weight	87 t
Max. speed	140 km/h
Length over buffer	18.90 m
Max. performance	5,600 kW
Max. starting tractive effort	300 kN

[89] compare Aerospace Transportation Bombardier Inc. (2008): data file TRAXX F140 DE

Technical data Bombardier Traxx 140 Last-Mile	
Diesel motor	Deutz 2013 4V, 7,8 l, 230 kW
Max. starting tractive effort "last-mile"	300 kN (diesel + battery), 260 kN (diesel only)
Diesel: Performance on wheel	180 kW
Fuel tank	400 ltr.
"Last-mile": max. speed	2,000 tonnes-train: ca. 40 km/h
Diesel: cruising range	ca. 8 h
Remote control	yes

Source: Bombardier

Figure 122 - Locomotive type Bombardier Traxx F140 AC "Last-Mile"

Source: Bombardier

3. Self-propelled rail freight wagons

1. CargoSprinter

In the late nineties, the former DB Cargo, together with the manufactures Windhoff und Bombardier/ Waggonfabrik Talbot, developed a concept for self-propelled freight train units designed for intermodal transport. One of the main goals of this concept was to increase the flexibility of rail transport in particular for the operation in sidings in order to conquer additional market shares.

Altogether seven prototypes had been manufactured and equipped with two control cabs and conventional rail wagons in between offering a total capacity for ten loading units (LU): swab-bodies or containers, each with a maximum length of 7.8m and a total weight of 16 tonnes (see Figure 123).

The CargoSprinters were reversible train units propelled by two conventional truck diesel engines allowing a maximum speed of 120 km/h. The designated rail production concept was a hub-and-spoke system connecting trade lanes with lower transport volumes not sufficient for direct trains.

For the long-haul transport, the CargoSprinter units were coupled in selected hubs and steered by one train driver. The coupling of was carried out very time-efficient using automatic coupling as well as contactless data and power transmission. Within regular service, no shunting was needed. After decoupling in an intermediate arrival hub located in the destination area, the units were driven to the final destination using one driver per destination.

Figure 123 – CargoSprinter (DB Cargo)

Source: www.forschungsinformationssystem.de/servlet/is/402123/

After testing the seven prototype vehicles for more than one year in the transport network of a leading German forwarder, all involved stakeholders decided to cease operation due to the following reasons (listing not comprehensive):

- Vehicle technology: no technical solution for the necessary synchronization of the installed truck engines;
- Problems related to punctuality;
- Manufacturing costs for the CargoSprinter units.

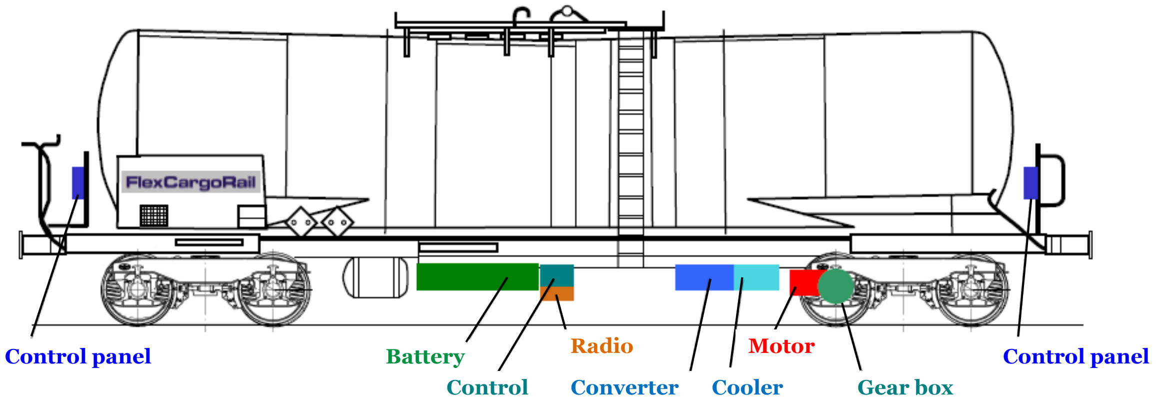
2. <u>FlexCargoRail</u>

FlexCargoRail (FCR) is a concept for electric self-propelled wagons that shall significantly improve the operation of rail freight on the last-mile. A concept study including a feasibility analysis and technical definition of the system started in 2007 and was finished in 2009. FCR can be regarded as a spin-off from the CargoSprinter project (avoiding marshalling) and the "200x production system"[90] for SWL of the Railion Germany AG, which requires in particular an efficient operation of transport volumes on the last-mile. The main goal of FCR is to reduce shunting movements as much as possible - or even completely avoid them - with locos for SWL transport.

Below, based on available sources, the FlexCargoRail approach and the most important results are summarised. Central element of FCR is the already described self-propelled wagon. In contrast to the CargoSprinter approach, it is planned to equip conventional rail wagons with an electric drive unit. The energy for the electric motor is provided through a battery which will be charged during long haul rail transport by the drive-motor which also has a generator function. Together with additional components like gear box, converter and steering devices, the wagon is prepared for autonomous driving in shunting speed. A sketch of an exemplary FlexCargoRail Wagon is shown in Figure 124 below.

[90] Introduced with the timetable change 2007 the new production system 200x of Railion Germany AG (today: DB Schenker Rail) was designed to optimize the production processes within the German single wagonload traffic in favor of higher reliability and lower cost. This was done by reducing the number of marshalling yards and the integration of interval connections.

Figure 124 - FlexCargoRail wagon (example)



Source: Institut für Schienenfahrzeuge und Fördertechnik, RWTH Aachen (translation by HaCon)

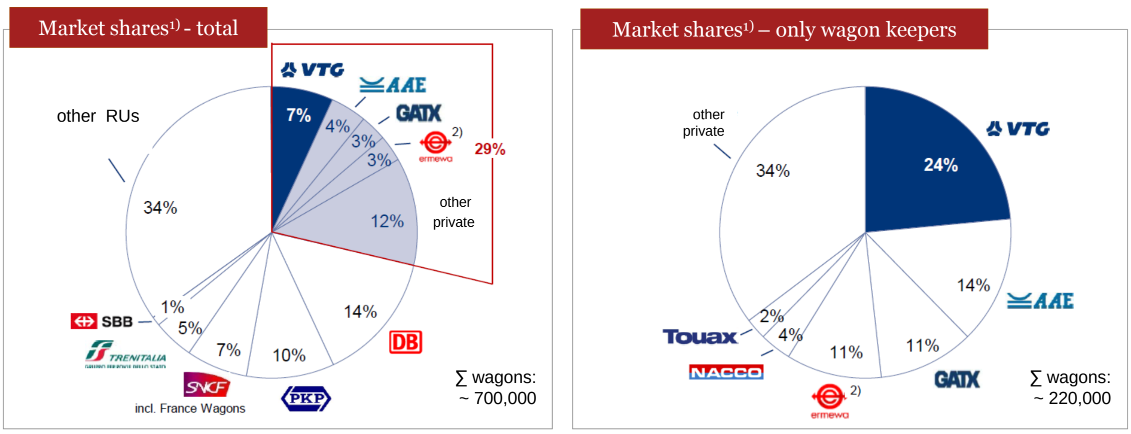
The self-drive function shall be used in the connection between the respective interchange points and the customer‘s sidings as well for necessary wagon movements inside the sidings (e.g. to serve loading and unloading facilities. The FCR wagon shall be driven by qualified shunting personnel (concrete driving regulations are not clarified yet) guided via the control panel. Depending on the number of wagons attached in "self-drive-mode", an operation range of up to 100 km is regarded as technically feasible. In a first assessment, the chemical and automotive industries have been identified as suitable target markets.

The FCR concept study was finished in 2009. In October 2015, no recent information or sources were available, if further implementation steps like for example prototyping or test implementations have been carried out.

4. Standardisation of wagons

In Europe, currently about 700,000 rail freight wagon are in operation. With more than 70%, the lion's share of these wagons is owned and/or operated by the European incumbent railway undertakings. Private wagon keepers in Europe own a fleet of about 220,000 wagons. The market structure and the important actors are shown in the following Figure 125.

Figure 125 - Structure of rail wagon market in Europe



1) managed active wagons
2) SNCF daughter, acting as a private wagon keeper

Source: Jürgen Hüllen, VTG Aktiengesellschaft, Presentation on DMG Jahrestagung, 26 October 2012

The European freight wagon fleet has a high diversity due to the historical growth of the market requirements responding on customer's requirements and country-specific needs. This in particular accounts for vehicles owned and operated by the railway undertakings. Whereas the wagon keepers mainly operate a rather modern and partly standardised wagon fleet for clients e.g. in the intermodal business, the chemical, automotive and petroleum industry with a high share of block trains and regular freight flows, the railway undertakings and their clients are facing the following challenges:

- Over-ageing of wagon fleet: with an average service life of 40 years, 17,500wagons need to be replaced annually. The average age of wagons owned by the European RUs is estimated to be 25 to 30 years:
  - DB Schenker operates a fleet of 96,800 wagons with an average age of 27.5 years (2014).
  - In 2008, Rail Cargo Austria had a fleet of about 19,500 wagons and planned to replace 6,750 by new units until 2012 (2,000 covered wagons for general cargo, 2,000 open flat wagons, 800 bulk wagons, 500 wagons for steel transport and 1,450 intermodal wagons).
- High share of specialized wagons: In 2012, SBB Cargo had a fleet of 8,000 wagons grouped into 48 types and additional numerous sub-types. Rail Cargo Austria's freight wagon fleet consisted of 160 different types (2008). DB Schenker's rail freight fleet consists of about 400 different types;
- High cost share for the provision and handling (shunting and empty runs) of wagons;
- Additional infrastructure needs for intermediate and, if necessary, seasonal parking of wagons (e.g. for agricultural products) in rail yards and sidings.

To solve these problems, together with car manufactures, the European railway undertakings and wagon-keepers have developed programmes for both the modernization and the standardisation of their wagon fleets.

Swiss Cargo for instance plans to reduce the number of different wagon types from 48 to 14 in the future within a renewal programme of the wagon fleet. This measure shall include for instance:

- Unification through the use of standard components for new wagons: e.g. bogies, axle suspension, wheel and axle sets, buffers etc.;
- Integration of available latest technologies: e.g. low noise brake systems (K-blocks, LL-blocks), light weight construction etc.;
- Implementation of advanced maintenance strategies based on telematics systems which are tracing the respective mileage and brake wear-out.

Another important step towards standardisation is the flexibilisation of wagons usable for different types of cargo. An upcoming strategy is the division of a car into the "rolling vehicle" and the "cargo platform". This offers the following benefits:

- Cost benefits through further standardisation of wagons (economy of scale through mass-produce);
- Cost-benefits by decoupling of different life-time-cycles (rolling vehicle: 40 years and cargo platform: 10 years);
- Quick adaption of freight wagons to market needs (seasonal up- and downturns, recession e.g. in steel industry) and also higher potential for the integration of rail wagons into complex supply chains (e.g. automotive industry).

Several European railway undertakings, logistics service providers and wagon manufactures are already either working on the development of respective solutions or have established them in the rail freight market. Below, two examples are described, mainly based on standard intermodal wagons.

1. Innofreight / Swiss Movers

The Innofreight GmbH is an Austrian company with a subsidiary in Switzerland. Innofreight is responsible for developing, operating and renting technical solutions for rail transport focusing on bulk goods like wood chips, corn, sugar, salt, chemical products, ore and unit loads (e.g.steel9. Their loading units are compatible with standard intermodal wagons. Currently, Innofreight operates roughly 7,000 containers for clients all over Europe. To improve competiveness of services, Innofreight developed a very light type of intermodal platform wagon which is operated by RailCargo Austria since 2014. Because of its tare weight of 14.7 tonnes, this wagon is not allowed be operated without loading units in freight trains.

If required, Innofreight also supplies equipment for the transhipment of loading units. 85 trains using Innofreight transport technology are operated between customers sidings in Europe per day. An overview on the transport technologies is shown in Figure 126.

Figure 126 - Innofreight transport technologies

Example	Remarks
	• Intermodal platform wagon developed by Innofreight • Tara: 14.7 tonnes (light wagon) • Coupled with bar • Capacity: 80' • suitable for all container and long goods
	• 30' container for ore and sand
	• 40' pallets for long steel product • 40' coil container planned

Source: Innofreight

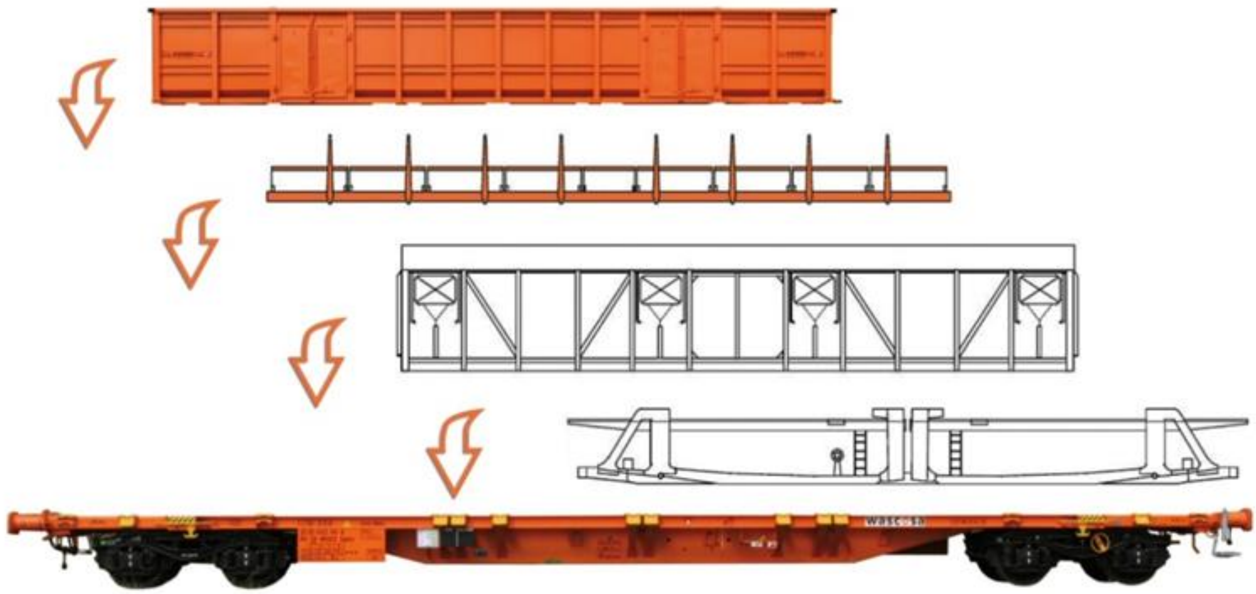
2. Wascosa Flex Freight System®

Wascosa is a Swiss-based leasing and managing company for conventional and intermodal rail freight wagons. The company also develops rail freight equipment in co-operation with manufacturing companies.

Currently, Wascosa's wagon fleet comprises of about 5,000 units, of which 50% are less than 5 years old. For the newer and new-built wagons, the company consistently works on the reduction of tare weight and unification of components. Regarding standardisation, in 2009 a concept for the multipurpose use of standard wagons was presented under the brand name "Wascosa Flex Freight System®". The system comprises of the following components (see Figure 127).

- A fully fledged 60' container wagon that can be operated without restrictions for intermodal transport;
- Depending on customer's needs, different loading modules allowing the conversion into a conventional freight wagon.

Figure 127 - Wascosa Flex Freight System®



Source: Wascosa

This wagon can be used multifunctional for e.g. intermodal (base wagon) and, depending on added superstructure, e.g. for dry goods, timber wood, finished cars etc. For forest industry Wascosa also offers timber cassettes with foldable stanchions in order to reduce costs for empty runs (Figure 128).

- Base of this loading unit is a 20' frame to be placed on a standard 20' position with container spigots;
- The cassette can be handled by both fork lift and reach stacker;
- Empty cassettes can be stacked.

Figure 128 - Wascosa Flex Freight System® - timber cassette

Combined timber / container transports with timber cassette	
	Timber cassette transhipment in intermodal terminal
	Empty timber cassette folding of stanchions and preparation for stacking
	Stacked empty timber cassette with folded stanchions

Source: Wascosa

5. Technologies of container platform wagons for last-mile deliveries

Within the framework of the ViWaS project, two technologies have been developed in order to improve the unloading and loading of maritime ISO-containers in rail sidings equipped with side ramps in the Swiss-split system (cp. Annex I). Currently, SBB Cargo operates overaged Ks-wagons with wooden doors which are not suited for container transport because of missing spigots for securing the loading units. The main advantage of the Ks-wagon is that the floor allows an unrestricted walking or driving on the wagon when unloading the container via the back-door (cp. Figure 129). To replace these overaged wagons, two technical alternatives have been developed:

- Based on standard intermodal 60' Sgnss wagon, Wascosa has developed a solution for a modified wagon that meets the requirements for unloading containers in sidings. This wagon, called "Flex Freight Car", is based on a classic Sgnss intermodal wagon. Compared to standard KS wagon, Sgnss wagon's floor is filled in with iron modular grids. If necessary, the floor can be removed offering a higher flexibility in wagon usability: it can be also used as a "classic" container wagon for terminal-terminal transports, where no floor is needed.
- SBB Cargo developed a 60ft platform: The so-called "Container Loading Adapter" consists of three separate 20ft modules, which together can be put on every standard Sgns or Sgnss container wagon. This platform also guarantees a totally flat surface to unload containers with forklifts.

Both solutions are displayed in the following Figure 129.

Figure 129 - Delivery of maritime containers by rail in Switzerland

Technologies last-mile deliveries	
	Maritime container on Ks-wagon
	Wascosa Flex Freight wagon with grid inlays
	Container loading adapter

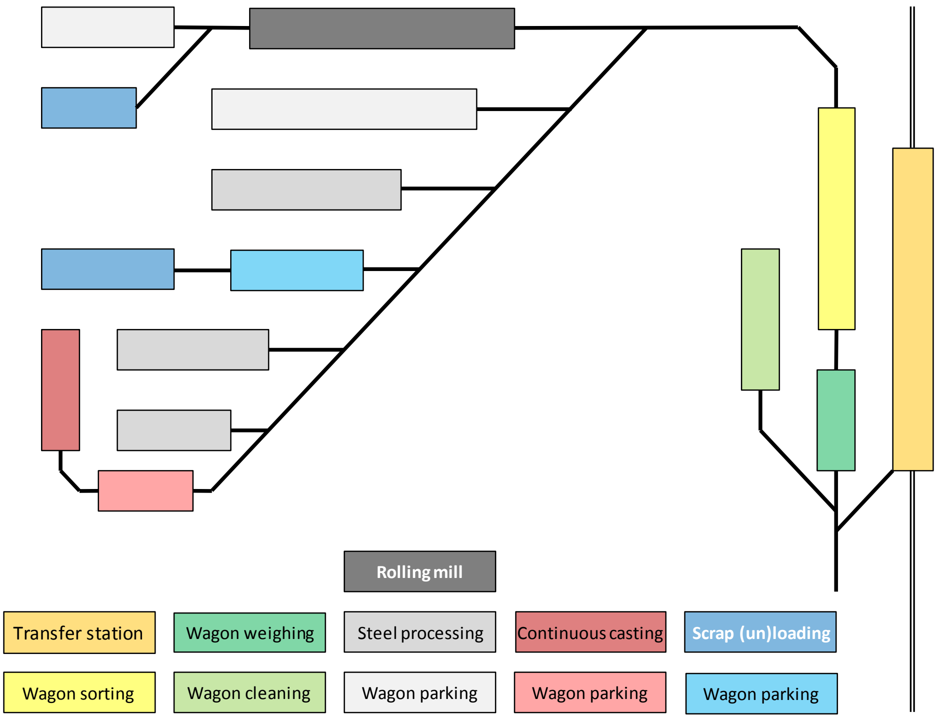
Source: SBB Cargo

Annex K – Examples for industry cluster-specific last-mile infrastructure and operation

1. Sample use case 1: Steel

An exemplary rail configuration of a steel plant is displayed in Figure 130. It shows a rather complex last-mile infrastructure with numerous loading points for different stages of steel production and processing (crude steel, semi-finished products, steel products).

Figure 130 - Typical LMI configuration in a steel plant



Source: HaCon

Inbound trains are either block trains (e.g. coke, ore, lime, partially scrap) or single wagons/wagon groups (e.g. empty wagons, partially scrap). Many steel plant operators require bundled supply of inbound materials; according to this, e.g. scrap transport has changed from typical single wagon traffic towards block trains bundled by main scrap suppliers.

Inbound trains are usually split-up according to their loading point destination and/or wagon type (e.g. different wagon lengths for steel products). Since all parts of the steel manufacturing facilities need continuous supply and provide continuous outbound volumes, buffer tracks are required.

Characteristic for many steel plants is the rail connection between the different facilities (e.g. scrap yard, blast/electric furnace, continuous casting, rolling mill, steel processing, product stock). Most of these facilities demand dedicated wagon types, sometimes even dedicated wagon compositions (e.g. special sorts of scrap). Wagon movements between these facilities require complex shunting operation and numerous loading/unloading procedures, often including “internal wagons”, which might only be operated inside the private siding.

Another main logistic requirement is the flexible use of last-mile infrastructure: in case of product change (e.g. from sheet pile to beams) the manufacturing framework conditions change, influencing the needs for product delivery/providing and thus also the demands on rail operation. This must be possible on the same last-mile infrastructure.

Further last-mile infrastructure of steel plants is needed for (scrap) wagon cleaning and wagon weighing (sometimes multiple weighing procedures of the empty/loaded wagon).

2. Sample use case 2: Chemical products

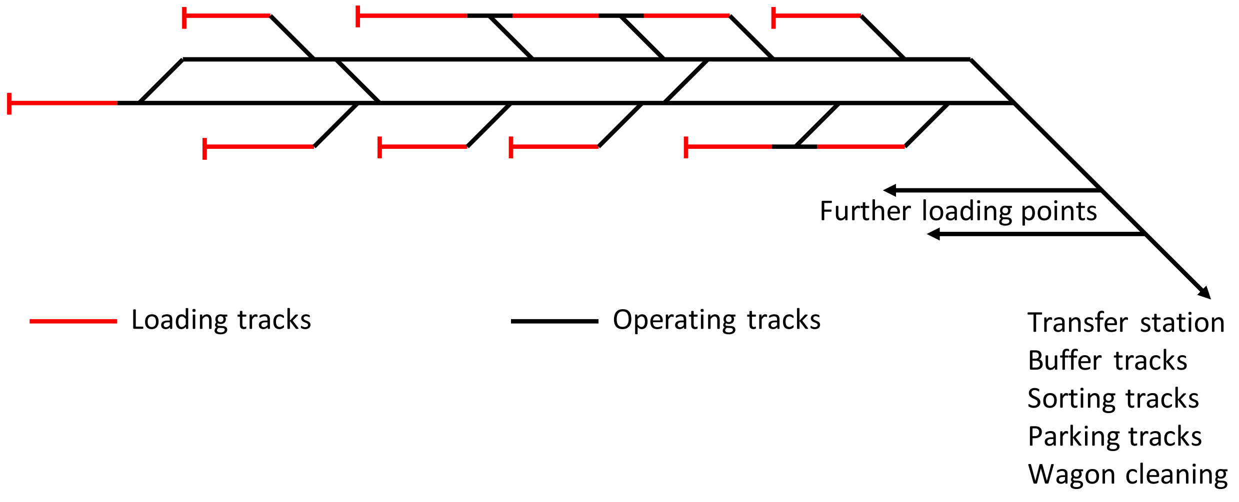
The product portfolio in chemical plants is often characterised by fluids, transported in tank wagons and with particularly high requirements on transport/handling safety.

Figure 131 displays an extract of a typical loading area configuration in a chemical plant. The rail configuration shows a double operation track with loading tracks sequentially arranged on both sides. The length of these loading tracks is usually designed for several single wagons rather for than large wagon groups or even block trains.

The heterogeneity of the chemical products on one hand implies individual requirements of each loading point regarding number of wagons, slots and duration for loading; in many cases the previous loaded product decides on the selection and dispatching of wagons. On the other hand continuous loading activities must be ensured. In total, these framework conditions lead to

- A demand of buffer tracks for inbound empty tank wagons;
- The need of sorting the wagons according to request by the loading points;
- Complex shunting operations in the loading areas;
- A demand of parking tracks for (loaded) outbound wagons and for
- Dedicated tracks for wagon cleaning.

Figure 131 - Typical configuration of loading points in a chemical plant



Source: HaCon

In order to simplify rail operation and to enable alternative usage of space currently needed for tracks, developments are currently ongoing to replace conventional tank wagons – at least partially – by special tank containers, which provide about the same loading capacity and are ready to use in intermodal transport chains (see Figure 132). Such developments would of course have particular consequences for the last-mile infrastructure in chemical plants.

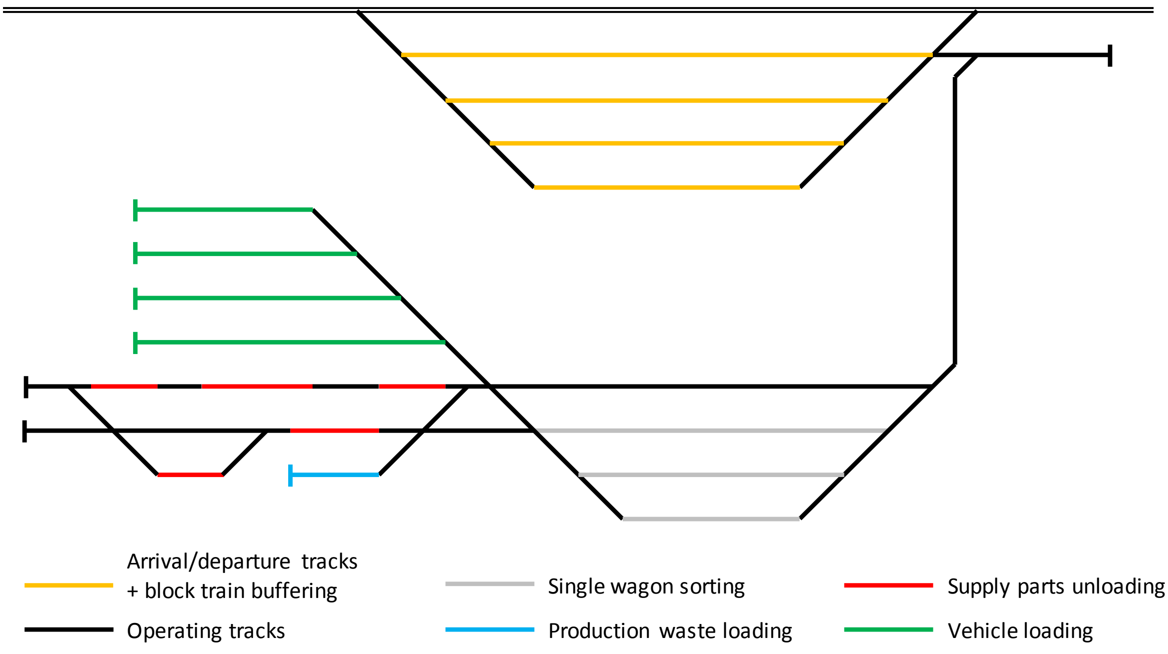
Figure 132 - New BASF tank container

Source: Van Hool

3. Sample use case 3: Automotive

Figure 133 shows a typical rail layout of automobile plants. It generally consists of two parts: one part is dedicated to the loading of vehicles. Inbound block trains consisting of car transport wagons usually are to be split up, due to the usable length of the loading tracks. Accordingly, outbound (loaded) vehicle transport wagons must be composed to block trains for departure. Respective tracks for buffering of empty block trains and for train splitting/composing must be foreseen.

Figure 133 - Typical rail layout in an automotive plant



Source: HaCon

The second cluster of tracks is for inbound supply parts and services between several automotive plants belonging to the same manufacturer. These inbound transports are usually required as Just-In-Time (JIT) delivery and are performed by intermodal or - in this example – by conventional single wagon transport. Also the consignment of production waste is normally done by conventional single wagon mode.

The configuration of the loading points for inbound supply is often similar to chemical plants (see sample use case 2). Accordingly, the sequential arrangement of the loading tracks requires additional tracks for wagon sorting and notable shunting effort in the course of loading point service.

4. Sample use case 4: Mineral oil products (Refinery)

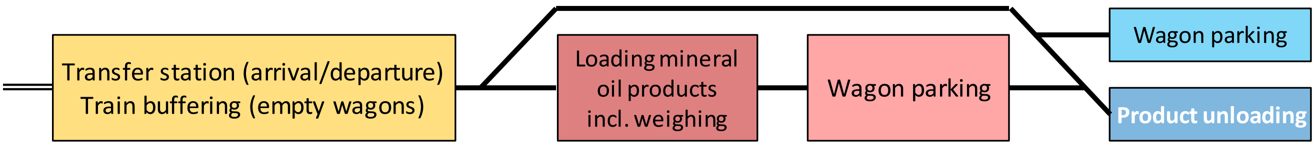
A typical representative for a mineral oil producing facility is a refinery (Figure 134). The last-mile infrastructure for this kind of private sidings is primarily designed for continuous loading of large volumes (petrol, diesel etc.).

Similar to chemical plants, tank wagons are predominately used for consignment; the characteristics of the products imply particular high requirements on transport and handling safety.

The inbound rail volumes of the refinery consist of block trains (rarely wagon groups) with empty tank wagons and mixed trains with chemical products (sulphuric acid, hydrochloric acid, caustic soda etc.). Especially for the block trains respective buffer tracks have to be foreseen.

Inbound trains must normally be split up: block trains according to the usable length of the loading tracks and mixed trains by loaded commodity. On the outbound side trains are to be composed accordingly.

Figure 134 - Typical LMI configuration in a refinery



Source: HaCon

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ANNEX L

Design features for support – programmes for investments in Last-mile infrastructure

Focus on EFSI / private finance

Strictly private and confidential

Contents

Potential market size

Assessment of infrastructure and investment needs

1

Assessment of infrastructure and investment needs

In order to define different kinds of financing strategies, the financial needs for investments in last-mile infrastructure have been specified for three **scenarios**, four types of **last-mile infrastructure** and four **country clusters**.

Types of last-mile infrastructure	Country clusters	Scenarios
• *Private sidings* • *Public sidings* • *Rail logistics centres (railports)* • *Intermodal terminals*	• *Country cluster I* • *Country cluster II* • *Country cluster III* • *Country cluster IV*	• *Trend 2030* • *Minus 2030* • *Plus 2030*

Investments in rail last-mile infrastructure are aimed to:

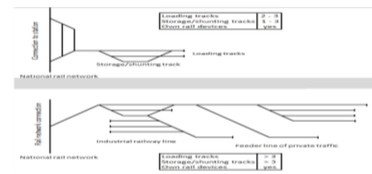
- **complete the missing links** in terms of effectiveness (mainly cross-border sections and bottlenecks/bypasses);
- **upgrade the existing infrastructure;**
- **solve the obsolescence of access points** and
- **develop multimodal terminals.**

Assessment of infrastructure and investment needs

Last-mile infrastructure comprises a large variety of different infrastructure configurations associated with respective modes of operation.

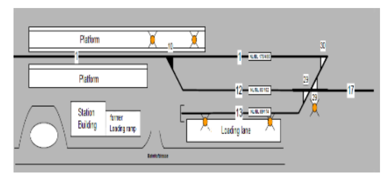
Private sidings

Privately owned and operated pieces of rail infrastructure, connecting loading facilities (which are not part of the rail infrastructure) to the public rail network.



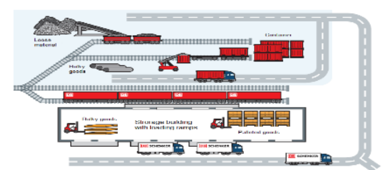
Public sidings

This category includes public accessible loading tracks, mostly located directly in public railway stations and owned by the respective infrastructure manager.



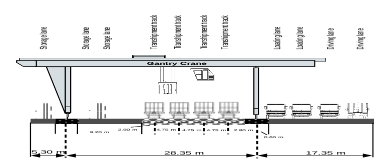
Rail logistics centres

All kinds of rail/road transhipment stations except intermodal terminals.



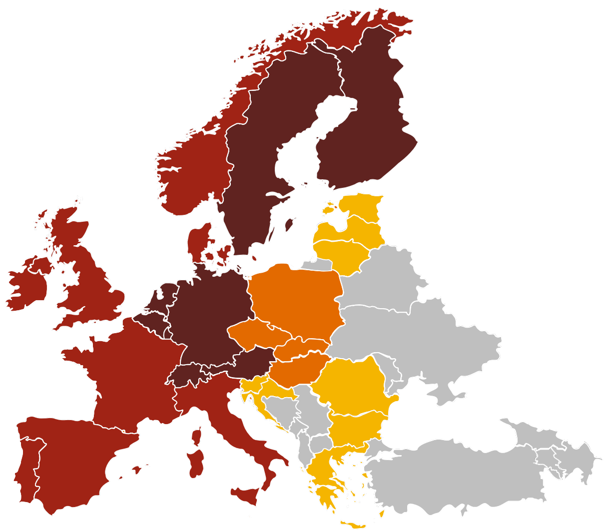
Intermodal terminals

Intermodal terminals are designed for transhipment of standardised loading units (containers, swap bodies, trailers) between at least two modes.



Assessment of infrastructure and investment needs

The EU countries have been classified into clusters based on the **economic framework conditions** and the **structure of national rail freight** (development rail production systems and last-mile infrastructure).



Country cluster I	• Highly developed economies; • Rail freight has and will have an important role; • Single wagonload is in an ongoing restructuring process; • Public sidings are of minor and decreasing importance; • Rail logistic centres will increase.
Country cluster II	• Economic structures as Cluster 1; • Single Wagonload exists only in relics or has been abandoned.
Country cluster III	• Since 2004, EU Member States have gone through a process of adaptation of their economy; • Rail transport has decreased in the past years, but single wagon load will still play an important role in 2030.
Country cluster IV	• Countries undergoing a process of industries and related rail infrastructure restructuring; • In these countries a very high number of public sidings is still existing and will be significantly reduced.

Assessment of infrastructure and investment needs

In order to estimate and quantify the impact of additional anticipated future trends, the following scenarios have been considered:

Trend 2030 – assumptions considered for the 4 country clusters

- Volume increase of large private sidings;
- Abandoning of various smaller access points due to market demand;
- Public sidings will lose their importance;
- Rail logistic centres will be partially substituted by private/public sidings and will develop new market segments.

Minus 2030 - unfavourable conditions for rail freight compared to the Trend 2030

- Higher concentration on large private sidings;
- Stronger abandoning of smaller private sidings;
- Public sidings with very small or without relevance.

Plus 2030 - more favourable conditions for rail freight compared to the Trend 2030

- Ongoing trend to large private sidings;
- Increased revitalisation of smaller private sidings.

Market size: investment needs in the EU by all freight access points

The development of the all access points in the time frame 2015-2030 is reported in the following scheme.

	2015	2030 (Minus vs 2015)	2030 (Trend vs 2015)	2030 (Plus vs 2015)
Conventional access points	**≈ 21.410**	≈ -50%		≈ -20%
Private sidings	≈ 15.610			
Stations with public sidings	5.610			
Rail logistic centres (railports)	190			
Intermodal terminals	≈ 730	≈ +2%		≈ +10%
All rail freight access points	**≈ 22.140**	≈ -30%	≈-27%	≈ +10%

Assessment of investment needs
(new construction and upgrade)

≈ +10 Bn (EU level)
(Average investment need per year and per country: 20-25 Mio €)

Market size: investment needs in the EU by conventional access points

The total investment needs foreseen by **conventional access points** in the **Trend scenario 2030** is **5.3 billion EUR** (54% out of the total).

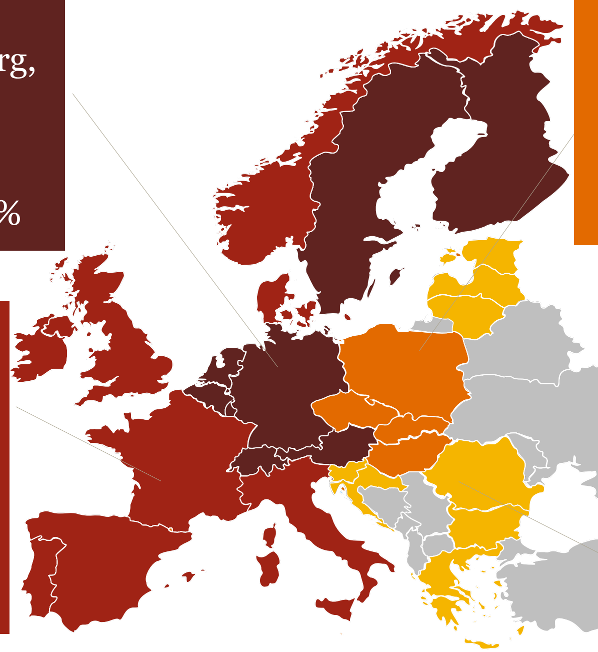
100% ≈ +9,7 Bln

Country cluster 1

- Countries: Austria, Belgium, Finland, Germany, Luxembourg, Netherlands, Sweden, Switzerland
- Conventional investments: 24%

Country cluster 2

- Countries: Denmark, France, Ireland, Italy, Norway, Portugal, Spain, United Kingdom
- Conventional investments: 13%



Country cluster 3

- Countries: Czech Republic, Hungary, Poland, Slovakia
- Conventional investments: 8%

Country cluster 4

- Countries: Bulgaria, Croatia, Estonia, Greece, Latvia, Lithuania, Romania, Slovenia
- Conventional investments: 9%

The average investment need per year and country is 20-25 Mio EUR

Private sector involvement

Main issues and possible solutions

2

Main issues and possible solutions

In order to involve privates in investments in last-mile infrastructure, it is essential to solve some issues by the development of a comprehensive political and regulatory approach

Issues		*Solutions*
Administrative burden: • Unclear norms; • Standards and operational rules to access to and operate sidings are not very effective.	→	**Administrative burden:** • Lighter norms; • Clarity on relevant European Regulation.
Lack of territorial planning: • No dedicated budget for investments in last-mile infrastructure is available at Regional, Country and EU level; • No coordination between the Cohesion and Structural Fund with transport policy objectives.	→	**Lack of territorial planning:** • Adoption of dedicated last-mile infrastructure development plans in order to consolidate and develop the freight market/demand within the area of investment.
Lack of reward mechanism: • Absence of an effectiveness-based reward mechanism (e.g. differentiated track access charged, subsidies, tax incentives)	→	**Lack of reward mechanism:** • Introduction of a specific reward mechanism in order to unlock the potential for private finances being invested in last-mile infrastructure

Possible financing strategies

3

Financing strategies for last-mile investments

Possible structure of last mile investment platform supported by EFSI

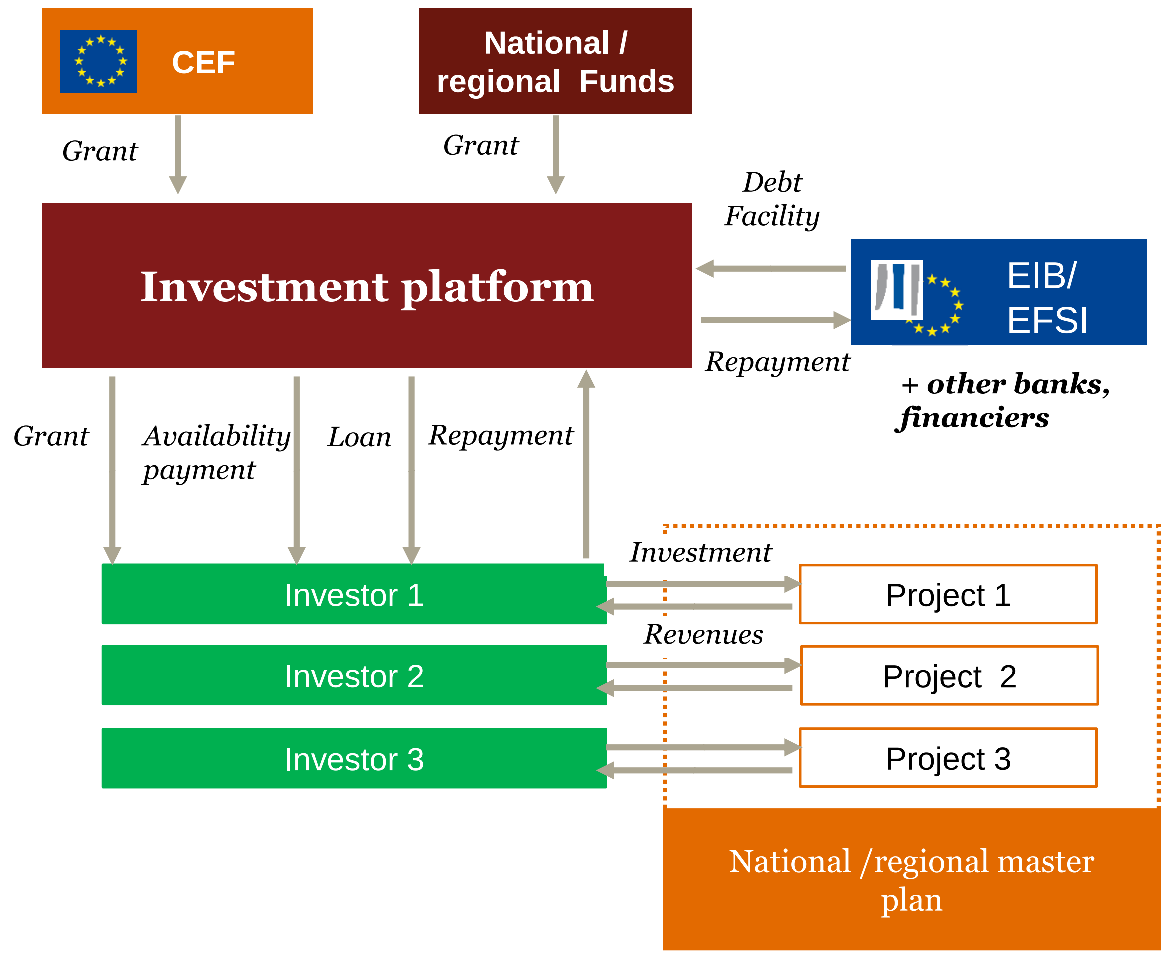
The creation of a **dedicated investment platform** providing grants and debts and supported by the EIB/EFSI may facilitate the financing of a predefined list of **rail logistics centres and intermodal terminals connected to ports of the Core Network.**

The platform may be established at EU, national or regional level.

The platform would gather:

- **National/regional funds**;
- **CEF funds** (granted within a call dedicated to last-mile investment);
- and may receive revolving resources by the EIB under EFSI.

The platform would invest in the **national/regional transport master plan**, consisting of a pipeline of pre-identified last-mile projects to be supported (rail road terminals and intermodal terminals).



Operation of the platform

- The platform supports a predefined list of last mile projects connected to **ports** and **intermodal centres** within the Core Network comprised in a specific **master plan;**
- The investment platform gathers financial resources from: national/regional funds, CEF funds and EIB resources provided under EFSI;
- The resources are transferred to the promoter of the project included within the national/regional master plan;
- The promoter receives a **grant** based on CEF funds and national/regional funds for the studies and for the building/upgrade of the infrastructure; and takes out a **loan** based on the EIB resources;
- After the realization of the infrastructure, the promoter repays the loan through:
    - The economic benefit resulting from the **increase in its performance** (e.g. increase in revenues generated by the higher volumes of goods in transit within the siding);
    - An **availability payment** based on national/regional funds, granted in case minimum conditions and performance (e.g. train kilometer) are guaranteed;
- The share of grant, loan and availability payment transferred to the borrower is defined by the manager of the investment platform depending on the assessment of the revenues generated by the project.

Investment platform features
National/regional master plan

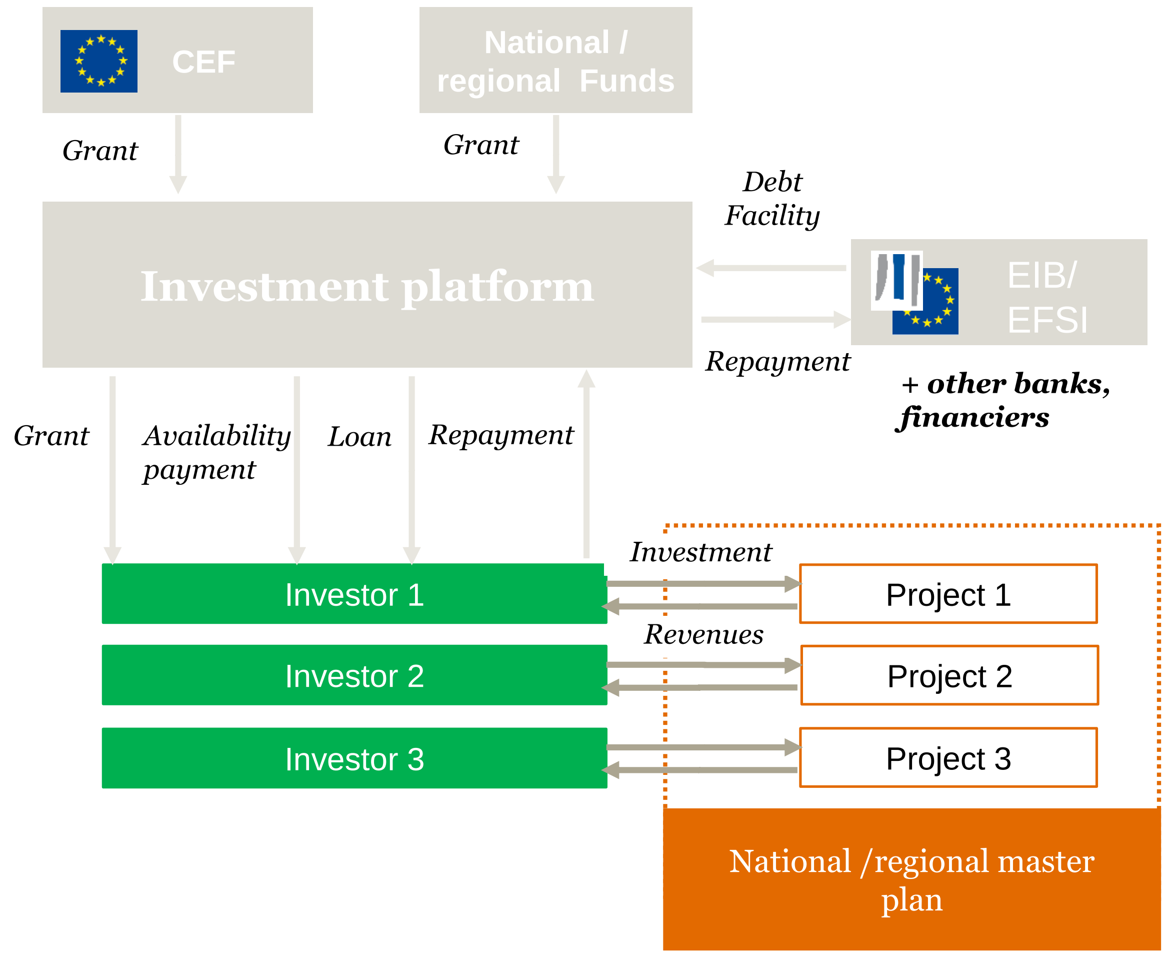
National and/or regional authorities define a specific **master plan**, identifying the projects to be financed under the platform and the related implementation timeframe.

The master plan focuses on projects related to the building or the upgrade last mile connections linked to ports and intermodal centres within the Core Network.

The programme may be also carried out in cooperation with the infrastructure manager.

The definition of the master plan ensures:

- **National/regional coordination** as regards the development of the infrastructure and regulatory aspects (in case the master plan is carried out at regional level, its approach complies to national standards);
- The achievement of a **critical mass** which enables EIB intervention;
- The possibility to create an **investment portfolio** consisting of independent projects, possibly enhancing the reduction of the portfolio investment risk.



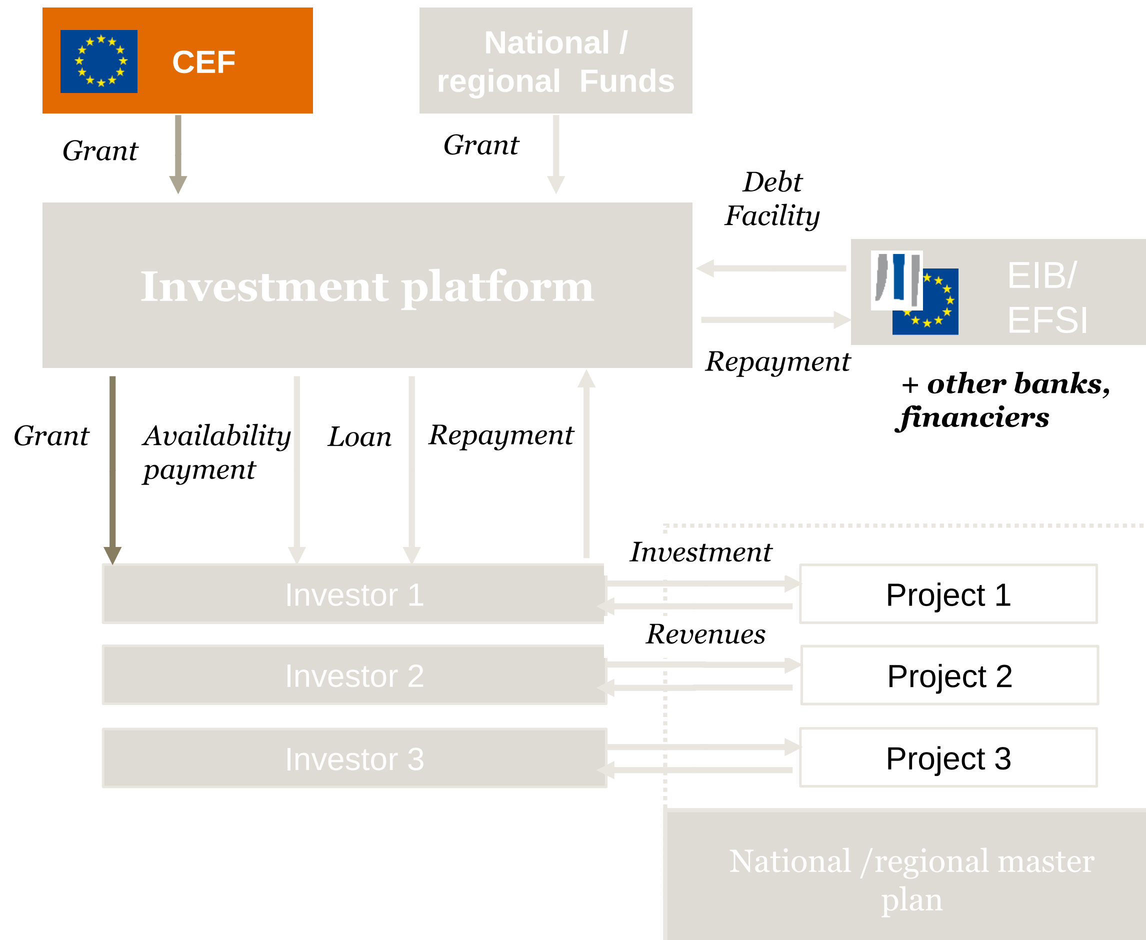
Investment platform features
CEF funds

To promote the development of last mile-infrastructure, the EU may provide funds through a **dedicated call for proposals under CEF programme**.

The CEF call would support:

- Studies (up to 50% of eligible costs)
- Works (up to 20%*-30%** of eligible costs)

The proposal would be submitted for the **whole national/regional programme** and would add-up to the resources available within the investment platform.



* Reg. 1316/2013 art. 10.2.b (iii)
** in case of project addressing bottlenecks (Reg. 1316/2013 art. 10.2.b (i))

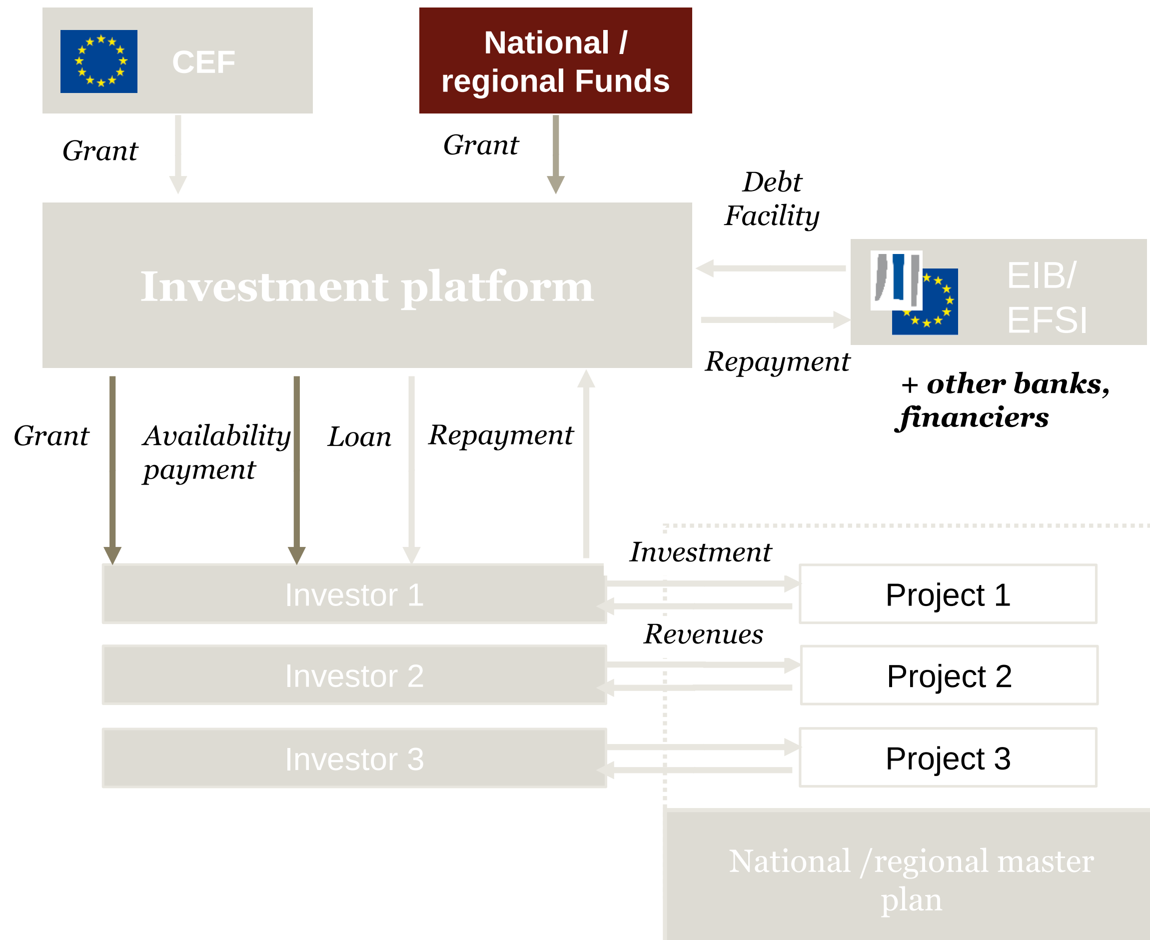
Investment platform features
National/regional funds

National and/or regional authorities may contribute to the platform through resources from:

- National Operational Programme;
- Regional Operational Programme;
- Own funds.

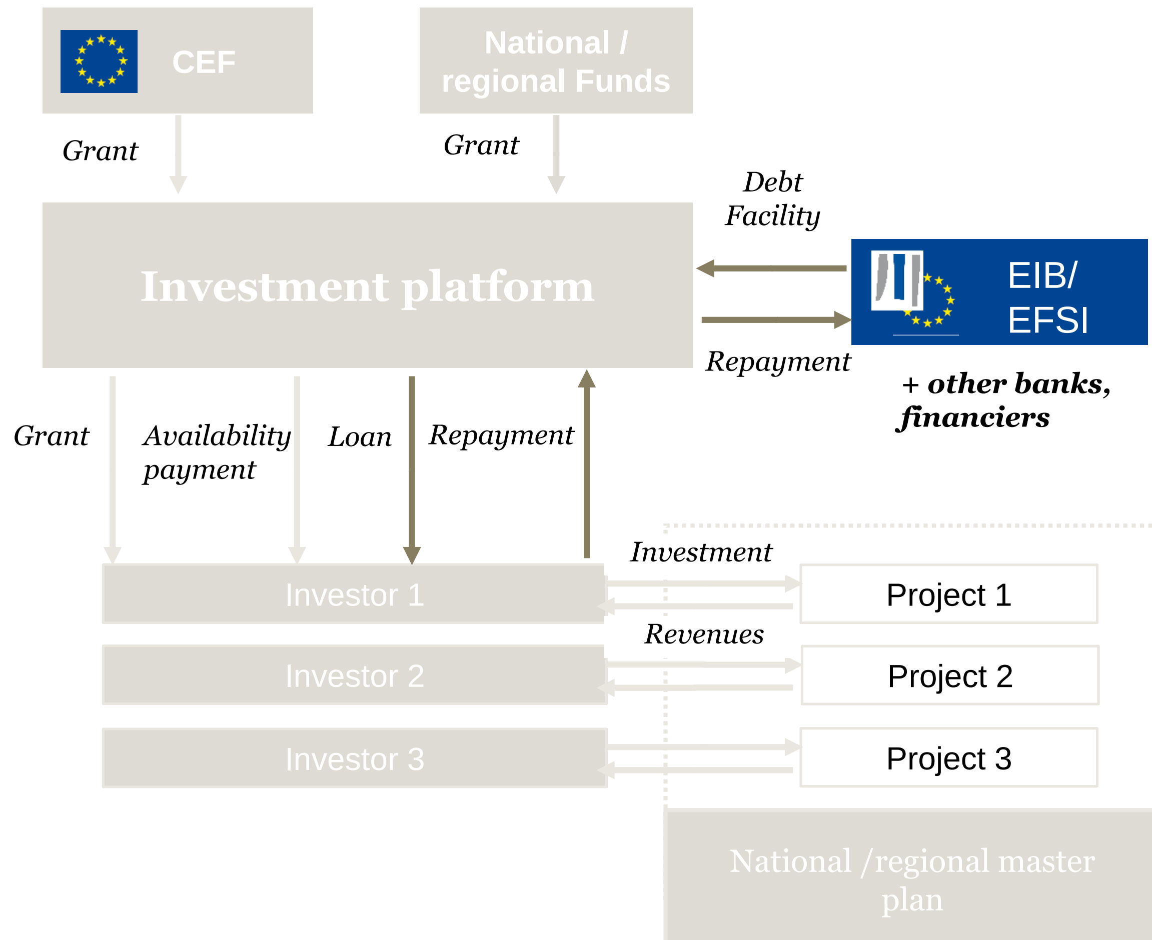
National and/or regional contribution to the platform is transferred to the borrower in the form of:

- **a grant** for the realization of the infrastructure;
- **an availability payment**, granted in case minimum conditions and performance are guaranteed **during the operational phase,** enabling the repayment of the investment.



Investment platform features
EIB/EFSI support

The EIB may contribute to the investment platform by providing revolving resources (e.g. loan) under EFSI.



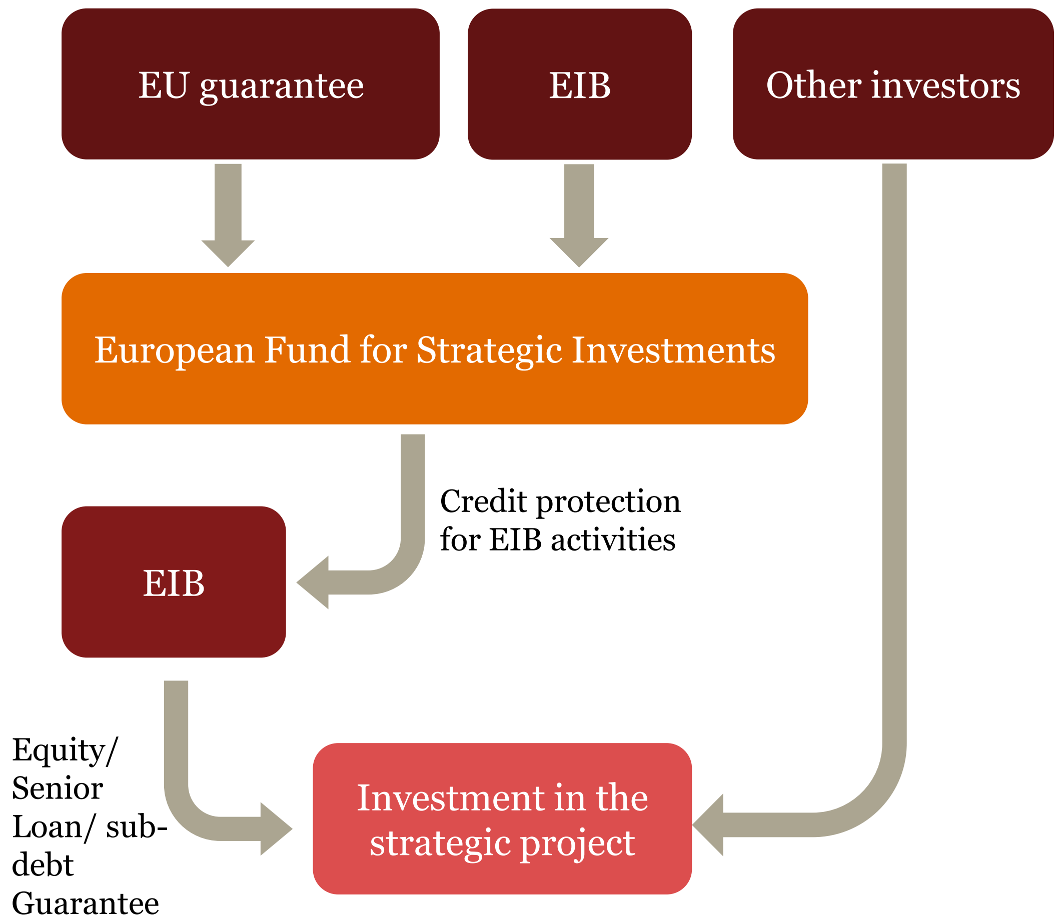
European Fund for Strategic Investments

The European Fund for Strategic Investments (**EFSI**) has been established with Regulation (EU) 2015/1017, to **support European strategic investments** through the supply of risk bearing capacity to the EIB (art. 3).

The idea behind the fund is that, by protecting the EIB line of credit, the EIB financing can support up to **3 times** the guarantee value.

This, in turn, would attract private investors, which, thanks to the guarantee provided by the EFSI, would invest their capital (approximately **5 times** the value invested by the EIB).

Explanatory scheme of the EFSI fund



EIB EFSI products

The EFSI serves as credit protection for new EIB activities, which can therefore be offered to a wider range of projects.

Sources of funding

European Fund for Strategic Investments

The Fund serves as credit protection for new EIB activities

Typical products offered

- Long-term senior debt for higher risk projects
- Subordinated loans, credit enhancement or guarantees
- Equity and quasi-equity

Other investors join in on a project basis

Final recipients and typical projects*

- Transport infrastructure
- Long-term investment funds
- CEF eligible transport projects
- Trans-European Networks

Application documents Project promoters should follow the usual EIB loan application procedures.

* *The projects supported is hereby presented considering last-mile investments, although the range is wider*

EFSI benefits and challenges

The guarantee provided by the EU enhances EIB investments in higher risk projects. However, projects are required to be economically viable projects and to add value to the EU.

Benefits

Being a guarantee, EFSI enables **credit enhancement** and, potentially, l**onger tenor loans**, compared to commercial banks.

Lower risks for financial institutions (thanks to EIB support through sub-debt, equity/quasi equity) and potentially, **improvement of lending conditions.**

Higher possibility to **attract financial investors** towards projects that would otherwise not considered financially viable

Challenges

Projects should result **economically viable** (with EFSI support). In case projects are not deemed able to repay the investments, EFSI would not apply.

Projects must show a certain degree of maturity to be eligible for the support.

Projects must be consistent with EU priorities and should produce EU added value.

Support is limited to projects proposed within five years' time.

In case of project overall costs do not exceed **20 M EUR,** bundling with other projects may be considered.

Example of national fund for last mile investments

In 2015, Spain established a national fund to support investments in rail and road last mile investments in ports, with the contribution of EIB under EFSI.

The Spanish State Fund for Ports Accessibility aims to support road and rail last-mile investments in ports of general interest.

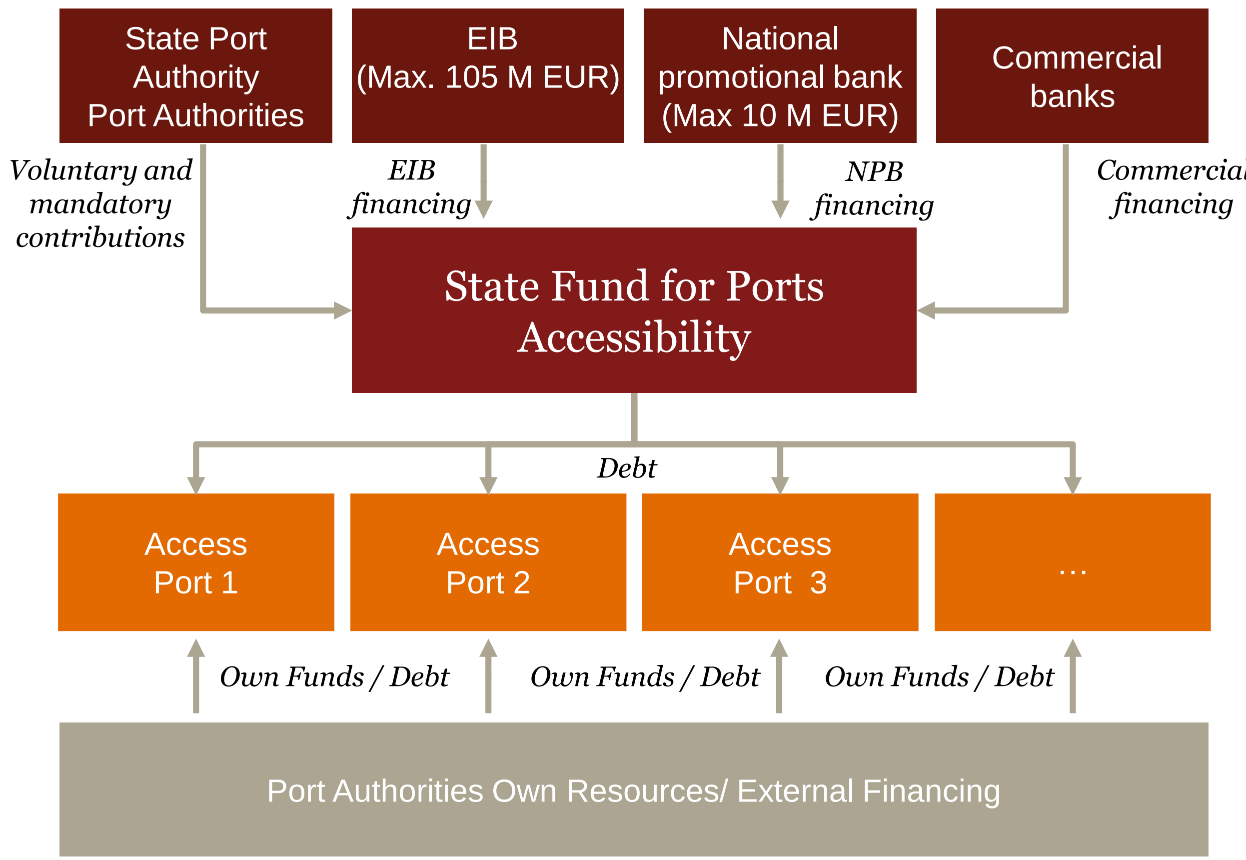
The fund gathers voluntary and mandatory contributions from State Port Authority and Port Authorities under the form of loan.

Port authorities contributions are repaid through periodic payments over 20 years (with 3 year grace period).

On the other side, Port Authorities may apply to the Fund for loans to finance eligible projects.

Besides voluntary and mandatory contributions from State Port Authority and Port Authorities, the fund received 105 M € under a loan from the EIB (covered by EFSI).

Spanish State Fund for Ports Accessibility



Back up

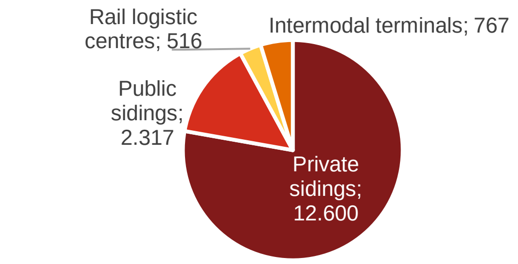
Assessment of infrastructure and investment needs

Within each scenario, forecasts for number of access points for conventional and intermodal transhipment have been carried out.

Trend 2030

Overall decrease by ~ 6,000 APs (- 27%), compared to 2015:

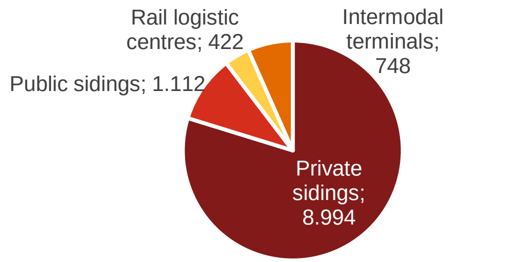
- Decrease is related to Public Sidings (-59%) and to (small/mid-sized) Private Sidings (- 19%);
- Considerable relative growth of Rail logistics centres (+ 173%) and moderate growth of terminals (+ 5%).



Minus 2030

Halving of 2015 number of LMI Access Points (-30% compared to Trend scenario):

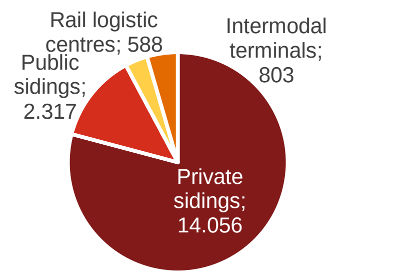
- Public Sidings will nearly disappear, only large Private Sidings will survive;
- Trend to concentration on Rail logistic centres and Intermodal Terminals.



Plus 2030

General tendency to concentration is valid also under more favourable rail conditions:

- Private Sidings and Rail logistic centres will benefit from conventional volume growth (no benefits for Public Sidings);
- Survival of (some) mid-sized and small Private Sidings.

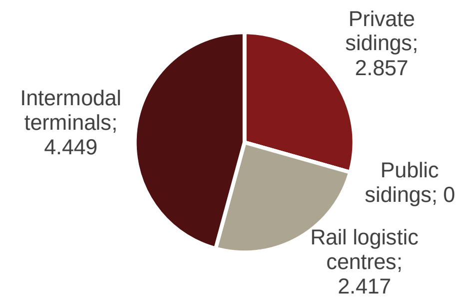


Assessment of infrastructure and investment needs

Investments for infrastructure and transhipment equipment on the respective facility's area as far as necessary for the rail access have been quantified.

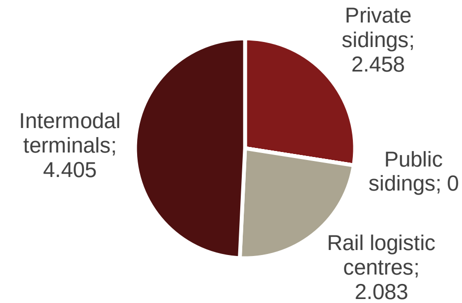
Trend 2030

- New construction and upgrade of last-mile infrastructure in Europe will request some **9.7 billion EUR**
- This means an average investment need of 20-25 Mio EUR per year and country.
- 46% of this total investment need is allotted to Intermodal terminals.



Minus 2030

Investment need drops to **9 billion EUR**, mostly due to conventional facilities



Plus 2030

Investment grows to **11.2 billion EUR** totally. Increase rate is lower than the facility development, since facility increase refers above average to small/mid-sized sidings.