30 by 2030

Rail Freight strategy to boost modal shift

Rail Freight Forward
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RAILFREIGHT FORWARD
EUROPEAN RAIL FREIGHT VISION 2030

Executive Summary

The European land freight transport market with its fleets of millions of trucks and tens of thousands of freight locomotives, wagons and barges is an important economic sector. Its impact on environment and society is often underestimated but massive: 275 million tons of CO_2 emissions and 50,000 premature deaths/fatalities are caused each year. The sector is expected to grow by 30% by 2030 and volume growth will most likely have a high affinity to road.

Transport growth should not, however, rely predominantly on road due to its heavy impact on environment and society. If the current modal split with 75% road freight, 18 % rail freight and 7% inland waterways persists (already an optimistic base scenario), annual CO_2 emissions will increase by 80 million tons by 2030, severely endangering the attainment of the Paris 2030 goals. Moreover, existing road congestion will further worsen with an expected economic loss of 1% of GDP per annum. The number of fatalities and additional premature deaths due to air pollution will cause significant societal costs.

Compared to road, rail freight has a six-times lower specific energy consumption, mainly due to its intrinsic and persisting physical advantage of the low friction of steel wheels running on steel rail. This translates into six-times lower external costs compared with road regardless of the energy source (while rail is even less polluting since it mostly operates on electric energy). In light of accelerating climate change, this advantage must become an eligible source of compensation for the existing direct cost disadvantages of rail transport versus road transport. A higher modal share of 30% rail freight by 2030 is a better macro-economic solution for European transport growth. The European rail freight sector is also convinced that this ambitious target is achievable, if the “way of doing business” is substantially changed, with more multi-modal solutions, and the required prerequisites are in place.

Decisive action is required by Railway Undertakings, Infrastructure Managers and Authorities to achieve the desired modal shift. The initiative to boost rail freight traffic, which was launched by the member states with the Rotterdam Declaration and supported by the declaration of the entire railway sector (Sector Declaration) in 2016, represents a valuable basis for these actions. Rail Freight Forward, the vision and action plan of the rail freight undertakings from across Europe, builds on the previous achievements and aims at a rapid implementation on the entire European Network going beyond the Rail Freight Corridors.

Our vision is to transform rail freight into a high-performing, efficient and sustainable backbone transport system for a European multi-modal logistics industry.

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1 The European land freight transport market will grow by 30% by 2030 and growth will have a high affinity to road

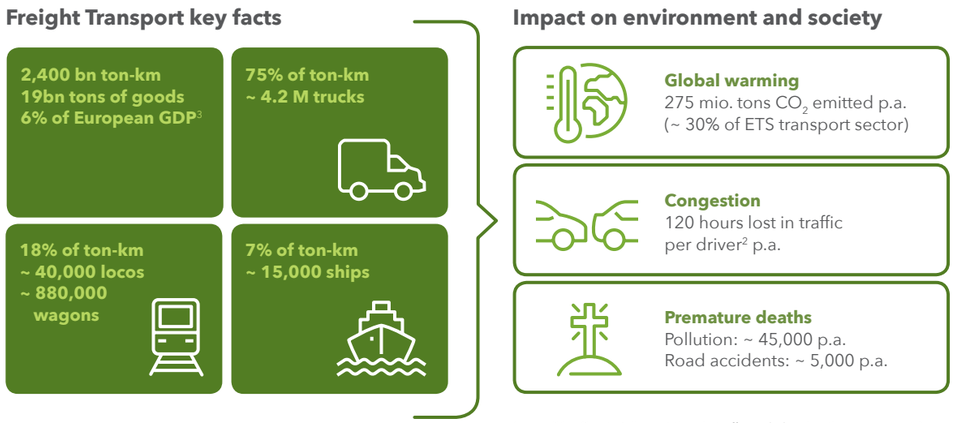
1.1 The European land freight transport market – an important economic sector with massive impact on environment and society

European land freight transport[1] is an important economic sector with massive impact on environment and society. In 2015, the transport performance of the sector reached 2,385 billion ton-km[2] or 19 billion tons of goods transported, representing about 6% of European Gross Domestic Product (GDP)[3]. At 75% (in terms of ton-km), the vast majority of these transport operations have been performed by 4.2 million trucks on European roads. Eighteen percent of transport operations (in terms of ton-km) have been performed by rail with a fleet of 40,000 locomotives and 880,000 wagons, whilst 7% have been performed by about 15,000 barges on European Inland Waterways.

The impact of freight transport on environment and society is massive, but often underestimated: the freight sector emits an estimated 275 million tons of CO2 per annum, representing 30% of total transport sector emissions, while passenger traffic (mainly private cars) accounts for the remaining 70%)[4]. Road freight contributes substantially to the prevailing road congestion in European urban centres. In France, Great Britain and Germany, each driver wastes about 120 hours in traffic on average per annum.[5] More importantly, analyses show that freight transport is responsible for a significant societal cost due to premature deaths, 90% caused by pollution and 10% by accidents, mainly on roads.

European land freight transport is an important economic sector with massive impact on environment and society

European[1] land freight transport facts and impact, 2015



1 EU 28 + CH, N | 2 Lost time in traffic and planning time, average FRA, GBR, GER | 3 Whole logistics sector | 4 Without aviation
Source: Eurostat, Fraunhofer IIS, EEA, EU commission, INRIX

Figure 1: European land freight transport overview, 2015

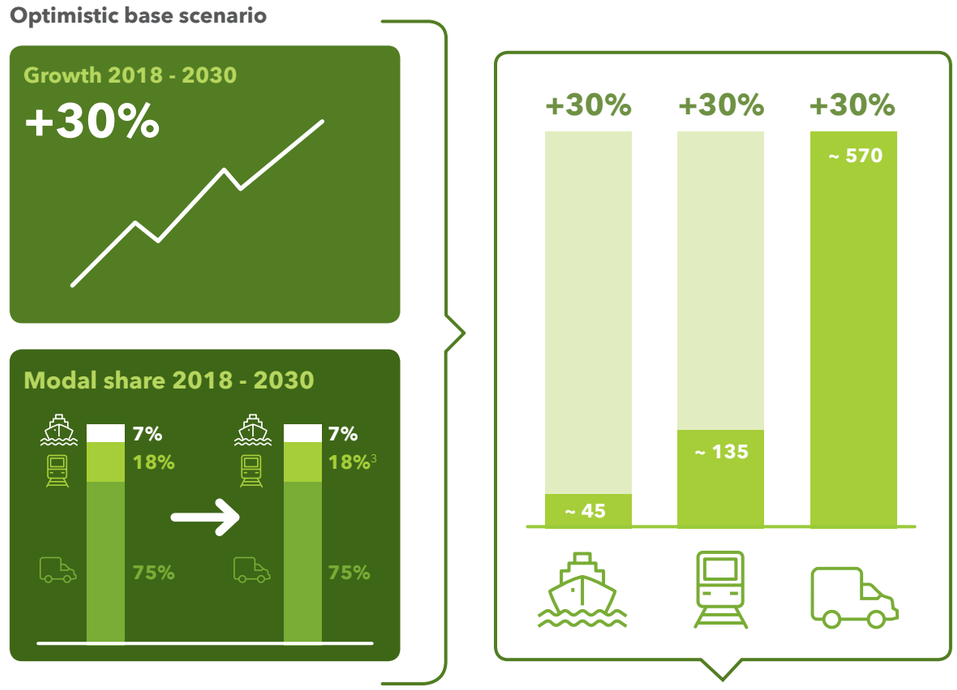
1 In this study we define European land freight transport as all freight transported by road, barge or train within EU 28, Norway and Switzerland. Transport by pipeline and short sea shipping are not considered since their volumes (mainly bulk volumes) are captive and can typically not be moved to train for economic reasons.
2 Eurostat
3 Entire logistics sector including transportation, warehousing, inventory holding, order processing and administration
4 Passenger traffic, especially individual motorised traffic, represents the remaining 70% share; air transport and international maritime are not included
5 INRIX estimate including lost planning time, i.e. indirect waiting time

1.2 Growth of 30% expected by 2030

According to macro-economic projections, European land freight transport will grow by 30% by 2030[6], assuming that there will be no further financial crises with a devastating impact on European industry and transport. With a constant modal split, an additional 570 million ton-km will have to be transported by road. This corresponds roughly to the size of the entire German freight transport market in 2015 and would require an additional fleet of about 1 million trucks on European roads. However, this scenario has to be considered already as an optimistic base case scenario as several factors point to a likely reduction of the rail freight modal share in favour of road transport.

Additional 570bn ton-km will be transported on road in 2030 assuming constant modal shares

Additional freight transport 2030 vs. 2018 in bn ton-km; EU 28 + CH, N; excluding pipeline, sea and air[1]



1. Not in focus, market size - 1,250 bn ton kom in 2017
2. Estimated range of 600,000 - 1,400.000 trucks
3. Stagnation of rail modal share (since 2004) continues
Source: Eurostat, OICD

Figure 2: Additional freight transport 2030 vs. 2018

Corresponds to

- Roughly the size of the entire German freight transport market (~ 600 bn ton-km in 2015)
- 1 million additional trucks[2] on European roads

6. Growth 2018 – 2030 according to OECD

1.3 Growth with high affinity to road – rail freight modal share challenged

Maintaining its current modal share of 18% will pose a challenge for the rail freight sector due to three main factors: an expected change of goods structure, general logistic trends and the high intensity of road innovation.

Projections of the transport market growth by type of goods[7] show that market growth for goods with a low affinity to rail are likely to grow strongly with a CAGR (Compound Annual Growth Rate) of 2.2% for 2014 to 2025. Goods with a high rail affinity will likely see a negative trend with a CAGR of -1.1% for goods suitable for full train services and -0.5% for goods suitable for single wagon services. Thus, goods with low rail affinity typically share one or more of the following characteristics: small shipment sizes, requirement of short transport times (typical for goods with high value density or perishables) as well as availability of last mile access to the rail track network at both ends of the transport chain. In general, rail freight may only participate in these transport activities by means of intermodal transport chains, e.g. between sea ports and the inland terminals to compensate for the cost of additional terminal handling.

Additional risk of further decline in rail modal share as volume growth will have a high affinity to road

Risk of decline of rail modal share[1]

1. Change of goods structure
... reduces the share of goods that traditionally have been on rail

- Strong growth of (consumer) goods with low affinity to rail[2]
- Negative growth of goods with (high) rail affinity (e.g., coal, metal, ores, wood)

2. Logistics trends
... lead to higher transport requirements for all goods (easier fulfilled by road)

- Smaller shipment sizes
- Increased pressure on price
- Shorter lead and transport times
- Higher reliability of transport

3. Road innovation
... is expected to reduce the price of road transport tremendously

- Gigaliners
- Platooning
- Autonomous driving
- E-Trucks with overhead wires

1 Also see backup pages in appendix
2 Due to small shipment sizes, short transport time requirements, JIT-delivery …

Figure 3: Factors influencing rail modal share

We also note that customer demands placed on transport providers are becoming stricter year by year. Logistics trends such as digitisation, faster innovation cycles and local production lead to an increased pressure on prices (e.g. through a higher transparency on capacity and market prices), smaller shipment sizes, shorter lead and transport time requirements, as well as higher requirements for transport reliability and transport information (e.g. for Just In Time transport chains).

7 Oliver Wyman market model, 2015

Lastly, the relative cost competitiveness of road transport versus rail transport is likely to increase, driven by fast innovation cycles of the trucking original equipment manufacturers (0EMs). Capacity increase (Gigaliners), platooning and autonomous driving are expected to reduce the specific cost of road transport by substantial double-digit percentages by 2030. In rail, asset replacement cycles are up to 10 times longer, which naturally limits the rate of innovation uptake, in the context of a relatively small rail freight supply market. Hence, its customers, the rail freight undertakings, need to drive innovation through their own programmes, while only a few are currently earning enough to be able to reinvest in their fleets. Providing sustainable financing models for rail freight undertakings is currently not a priority for many national policy makers since they do not see rail as a backbone or important part of mobility.

The share of transported goods with low affinity to rail is projected to grow significantly

Transport market structure by goods, 2014 - 2025 in percent ton-km, EU 28 + CH, N

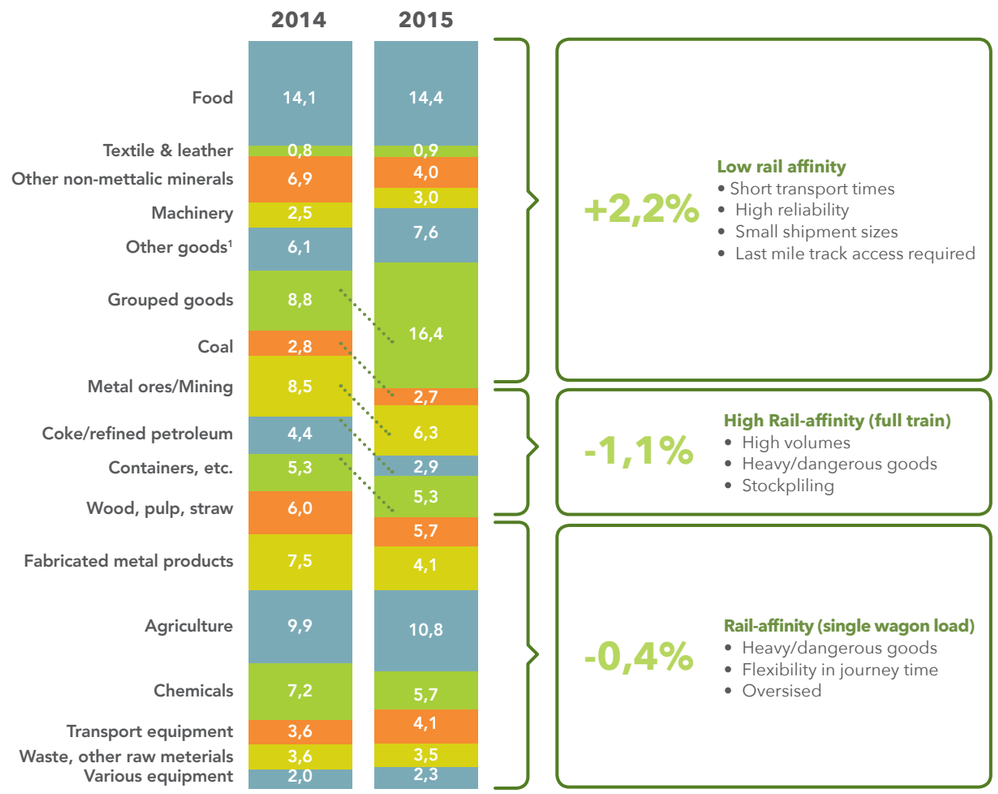


Figure 4: Transport market structure by goods, 2014 – 2015

1 Categories "Furniture, other mfg. Goods", "Mail, parcels", "Baggage, household", "Other goods"
Source: Oliver Wyman market model, 2015; Eurostat

2 Transport growth cannot rely predominantly on road due to its strong impact on environment and society

2.1 Paris 2030 agreement for CO_2 emissions likely not to be met

Growth of road freight traffic will have a significant negative impact on attaining the Paris 2030 goals for the entire transport sector: as a non-Emission Trading System (non-ETS) sector, the transport sector[8] is required to reach 70% of its 2005 emission levels[9] by 2030, amounting to a target of 660 million tons p.a. of CO_2 in 2030. Compared to current emission levels of 880 million tons of CO_2 in 2015[10], relative savings of 25 percent or approximately 220 million tons p.a. of CO_2 are needed by 2030.

However, the expected growth of road transport in the coming years needs to be taken into account: at current emission levels, it would increase CO_2 emissions by an additional 80 million tons p.a. to a total of 960 million tons in 2030. In effect, the sector will have to achieve at least a 31%[11] CO_2 increase in efficiency to reach the target of 660 million tons, also considering asset replacement cycles (3 – 7 years for trucks and much longer for passenger vehicles).

2.2 Road congestion to worsen by 2030 with total costs of 1% of GDP

Studies by Cebr[12] based on INRIX data forecasts show that congestion levels in major European countries[13] will see a modest increase of 6% compared to current levels, in part also driven by the growth of road freight transport.

Congestion costs are massive: for the three cited countries alone, they amount to 95 billion EUR per annum (1 percent of GDP), including direct costs for fuel and time wasted as well as indirect increased costs of doing business.

Whilst this increase is modest, the impact of road congestion is regionally very different. In particular, industrial regions such as Belgium, Netherlands and the Rhine-Ruhr region are severely affected by congestion. Road capacity in these regions is already fully used up and opportunities for further infrastructure development are very limited due to dense population.

2.3 Additional fatalities with significant societal cost expected by 2030

The increase in road transport will cause accidents and pollution. Approximately 60,000 premature deaths are attributable to air pollution ($PM_{2.5}$, NO_2, O_3, tyre and plastic particles) and the remainder are fatalities in road accidents with trucks[14].

The estimate of premature deaths due to pollution is based on 2014 data of the European Environment Agency, linking pollution levels to premature deaths and morbidity. Calculating the road freight contribution to pollution levels[15], the current impact of road freight transport and the impact of further growth can be calculated by linear extrapolation. This estimate therefore does not include potential technological improvements in road freight pollution emission levels which may reduce the above numbers somewhat. It should be noted, however, that a relative road freight transport growth of 30% will always lead to higher levels of premature deaths as compared to a scenario without road transport growth, even if road freight improves its emission levels.

8 Including passenger transport, excluding aviation and international maritime transport
9 939 million tons according to Eurostat
10 Eurostat
11 Efficiency increase must be higher if passenger transport growth is taken into account
12 Cebr report "the future economic and environmental costs of gridlock "
13 France, Germany and United Kingdom
14 Based on number of fatalities involving heavy goods vehicles, European Commission, 2014
15 European Environment Agency

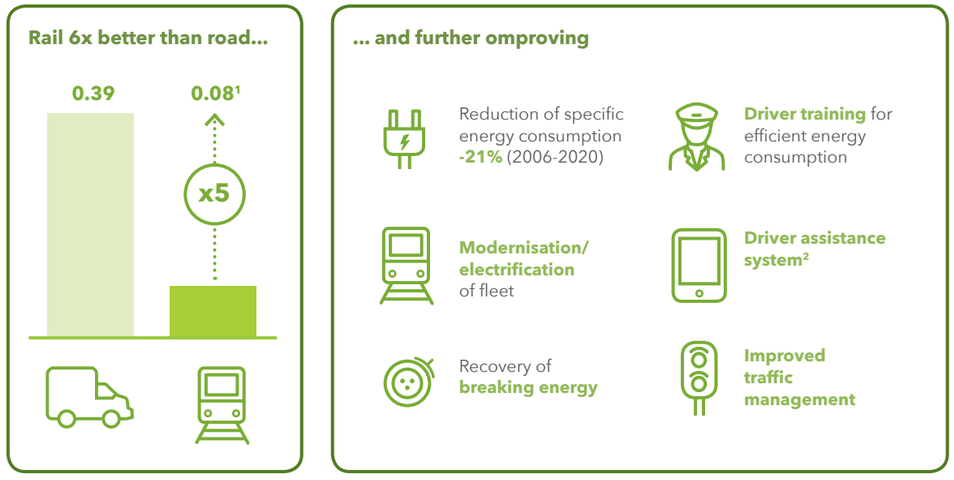
3 Higher modal share of 30% rail freight by 2030 is a better macro-economic solution for European transport growth

3.1 Outstanding energy efficiency of rail freight in comparison to road

According to the European Environmental Agency, rail freight has a six-times lower specific energy consumption per ton-km than road (see figure 5)[16]. The main driver for this outstanding energy efficiency of rail is the dramatically lower friction from operating steel wheels on steel rail versus rubber wheels on tar roads. The lower air resistance of a train set with up to 40 wagons in comparison to a fleet of individually driven trucks is a second important factor. In addition, between 2006 and 2020, one major European railway undertaking has achieved a reduction of its energy consumption by 21% and further improve-ments are still on the way, e.g. through modernisation and electrification of locomotive fleets or driving assistance systems. Whilst platooning or new engine technologies such as road electrification with recovery of braking energy may also further reduce specific energy consumption of road, they will never be able to come close to the outstanding energy efficiency of rail driven by its main physical advantage.

Rail has a 6x lower specific energy consumption than road due to physical advantages such as wheel-on-rail and electrification

Comparison of energy efficiency in kWh / ton-km specific energy input, 2017



1 Drivers: lower friction of steel-on-steel vs. rubber-on-road, high level of electrification
2 E.g., LEADER: Locomotive Engineer Assist Display and Event Recorder [co-financed by EU]
Source: German Umweltbundesamt 2016, RUs

Figure 5: Comparison of energy efficiency

16 Austrian Umweltbundesamt (2017); similar ratio published by the German Umweltbundesamt in 2016

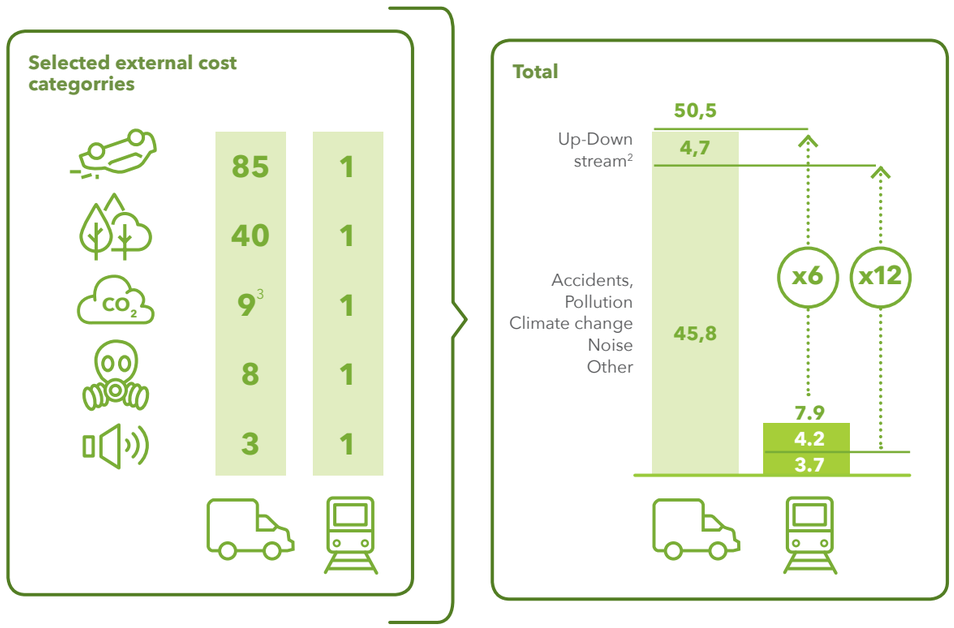
3.2 Significantly lower external costs of rail freight in comparison to road

The outstanding energy efficiency of rail and its proven safety systems translate into six-times lower external costs[17] of rail freight (7.9 EUR per 1,000 ton-km) versus road freight (50.5 EUR per 1,000 ton-km) according to figure 6. This advantage increases to a factor of 12 if the impact of prior/later steps in the transport value chain (the trucking part) is ignored. In terms of external costs related to traffic accidents, rail is even 85 times better than road. With regard to CO_2 emissions, rail freight is 9 times better than road[18]. Even for noise, the most debated negative environmental impact of rail freight, rail still fares about three times better than road due to the fact that a much larger share of the European population is exposed to noise by road than to noise by rail.

The much higher external costs of road freight are in effect borne by society. Their dramatic impact is often not felt immediately by citizens but may not be ignored any longer in the face of accelerating global warming. Therefore, the advantage in external costs must be an eligible source of compensation for the existing direct cost disadvantages of rail vs. road transport, especially on shorter transport distances.

This translates into far lower external costs for rail – a compensation for direct cost disadvantages of rail vs. road

Comparison of external costs[1] in EUR/1,000 ton-km, 2012



1 Noise, Climate Change, Pollution, accidents, other excluding congestion based on EU + CH, N
2 Impact of prior/later steps on value chain, e.g. supply of fuel
3 Figure based on source. Other more recent sources (e.g. German Umweltbundesamt 2018) use ratios of approx. 6:1
Source: eRRac, CE Delft 2012, Fraunhofer, INFRas

Figure 5: Comparison of energy efficiency

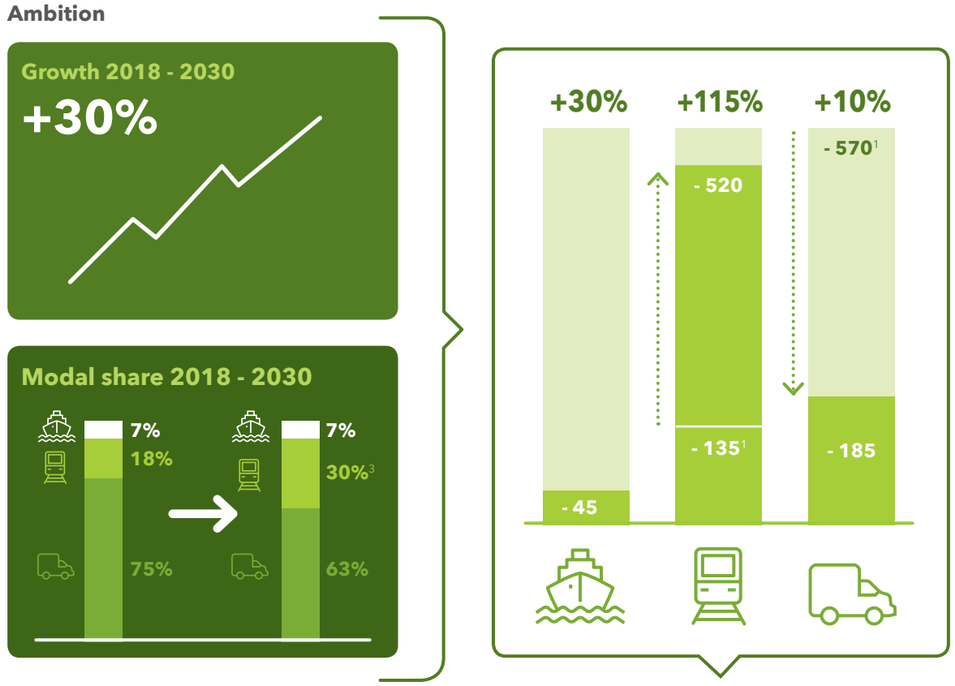
17 CE Delft 2012, Fraunhofer
18 European Environment Agency EEA 2017

3.2 Modal shift towards 30% rail freight by 2030 to prevent the negative effects of growth

The European rail freight sector is convinced that a strong increase in the rail freight modal share from 18% in 2015 to 30% in 2030 will avoid most of the negative impact related to road traffic growth (see figure 7).

A higher modal share of 30% rail freight by 3030 is the macro-economical better solution for European transport growth

Impact of modal shift on additional freight transport 2030 vs. 2018
in bn ton-km; EU 28 + CH, N; excluding pipeline, sea and air



1. Freight transport growth without modal shift
2 Assuming linear growth of rail modal share from 18% in 2018 to 30% in 2030
3 Shares in AT (32%) and CH (37%) in 2015 even higher; conditional ambition (see next chapter)
4 Reduction of ~ 8 bn EUR in external cost, ~ 25 mio. tons CO_2, ~ 3,500 premature deaths/fatalities (assuming constant growth)
Source: CER, EuroStat, EU Commission, EAA

Estimated impact 2019 - 230[2]

- ~ 100bn EUR economic gain due to less externalities
- ~ 290 Mio. tons CO_2 saved
- ~ 40,000 premature deaths due to pollution avoided
- ~ 5,000 fatalities due to truck accidents saved

Every percent modal share increase has strong positive impact on environment/society[4]

Figure 7: Impact of modal shift on additional freight transport

This modal shift would result in doubling the transport volume on rail and lead to an economic gain of 100 billion EUR due to lower external costs[19], 290 million tons of avoided CO_2 emissions and 45,000 fewer premature deaths and fatalities.

The European rail freight sector is also convinced that this ambitious target is achievable. Rail freight modal shares in countries with governments consistently supporting modal shift[20], such as Austria (32% modal share in 2015) and Switzerland (37% modal share in 2015), have even exceeded this target. Clearly, the current situation for each country is different and achievable target levels will have to be set individually.

The target of "30 by 2030" is also a conditional target. It will only be achieved if the "way of doing business" is substantially changed, e.g. with more multi-modal solutions and certain prerequisites in place, as we will explain in the following chapter.

This modal shift would still lead to a 10% increase in transport volumes for road by 2030. It is not actually a question of rail versus road, but the optimal choice or combination of transport modes depending on individual strengths, ideally also in multimodal solutions with rail freight as a high-performing backbone.

19 Ignoring the costs of rail track expansion, which are likely to be lower than the costs required for expanding the road network. The use of modern signalling systems and de-bottlenecking of certain railway nodes may release further substantial capacity, see also the "Digital Track Initiative" of the German Government

20 Eurostat

4 Fields of action for modal shift

The analysis in the previous chapters shows that a decisive change to the dominant logistics model is needed. The existing imbalance in modal share will lead to a standstill of the logistics apparatus and will endanger economic growth. Every day, experience shows this harsh and inconvenient reality. In some European countries, such as Switzerland and Austria but more recently also in Germany, authorities and the railway sector have been working together to tackle this challenge. They are proving that under the right conditions, freight transport via rail is competitive compared to other modalities. Furthermore, from a societal point of view, rail transport is a better mode than any other.

However, in most countries we are facing a huge challenge to modernise the rail sector and make it part of the logistical backbone of Europe. It requires every infrastructure manager to put maximising the number of passengers and volume of goods transported on their network at the core of their strategy and to move beyond merely managing the infrastructure towards managing the flows of passengers and goods. It requires governments to challenge and evaluate their infrastructure managers on this mission and to provide their infrastructure managers with the means of achieving this. Finally, it requires railway undertakings to be far more customer- and growth-driven than in the past.

In short, it requires a mental shift to modal shift by railway undertakings, infrastructure managers, policy makers and authorities. A mental shift to make modal shift a reality by decisive action in three fields:

1. The rail freight operating sector works on speeding up the journey of offering superior innovative products for the benefit of the customer;
2. Infrastructure enables and regulators support the view that driving a train is "as simple as running a truck";
3. Transport policy initiatives must be directed towards multimodality with an important market share for the railways by creating fair intermodal conditions (e.g. equal treatment of internal and external costs).

4.1 Railway Undertakings continue the journey: offering superior innovative products for the benefit of the customer

The sector is characterised by heavy investments with long product life cycles. Investments in locomotives and other rolling stock are currently being financed over a period of 30 years. This contrasts with other industries where innovation cycles are described in months and product cycles in weeks.

4.1.1 Productivity improvements and financial performance

RU's need to be economically performing to attract customers. The sector has already gone through major efficiency programmes. Still it is not able to reach sufficient profitability to allow a buffer for replacement investments. It remains an absolute necessity to continue the journey of restructuring and modernisation to achieve a competitive cost base and high resource productivity.

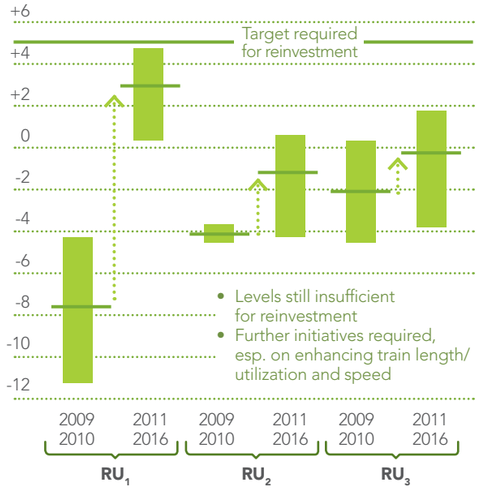


Figure 8: Profitability of the different RU's has improved but is still insufficient to allow replacement investments

4.1.2 Development of attractive rail and multimodal solutions

RUs need to intensify their work on quality, flexibility and ease of use to convince more customers. Only by offering rail products that are superior to trucks, will they be able to attract customers towards rail.

The sector undertakes to provide track-and-trace and ETA data as soon as possible

A number of other best practices have been developed over recent years:

- Integrated multimodal solutions with innovative loading systems provide attractive solutions for truckers with standard trailers. Customers do not need to change their logistics concept. The truck and driver can therefore work with them for increasing speed/asset productivity;
- Xrail, the Single Wagon Load alliance, responds to customer demands on reliability and integrated information requests. It acts as a platform for innovation and technical collaboration;
- Networks of customer-specific direct shuttle trains between major economic hubs have developed into reliable and cost-efficient solutions. Moreover, they are able to halve the transit time;
- RUs take care of the whole supply chain for customers by offering door-to-door services. The highest requirements on quality and reliability (Just-in-time production with bottlenecks on good delivery) imply the deployment of high-tech monitoring and control systems.

Even though RU's have improved over the last few years, there is still a lot of work to be done in terms of simplifying processes and developing more attractive rail solutions. Providing track-and-trace with estimated time-of-arrival data to our customers should, for example, become the standard.

4.1.3 Digitisation/technical innovation in rail freight

In the area of product and asset innovation, partnerships with technology suppliers have produced the first results on the intelligent wagon and the digital train. This will be more efficient, more economical and even more environmentally friendly.

In terms of efficiency, the possibilities of autonomous driving are examined. Trials with driver and wagon automation deliver higher reliability, reduce labour costs and provide more economical operation of feeder networks, which is the segment where the competitiveness of rail can be further enhanced. Telematics and added wagon intelligence open routes to new innovative services, increase fleet availability and allow optimised preventive and curative maintenance. Finally, energy efficiency and the use of alternative energy sources (e.g. production of electricity from renewable sources) are high on the agenda.

In the field of process innovation, joint projects are set up with customers. On the basis of design thinking, value engineering and lean management, problems are examined in collaboration with the customer and processes are optimised. RU's take a great responsibility in the supply chain through a holistic approach to logistics ranging from vendor managed inventories to combined transport concepts or automated conveyor systems. Supply chain and all other supporting processes are considered. Load optimisation and load increase must be the objective.

Key to the success of innovation projects will be for the RU's to work together to drive standardisation.

The RU's undertake to work together to drive standardisation in IT innovation

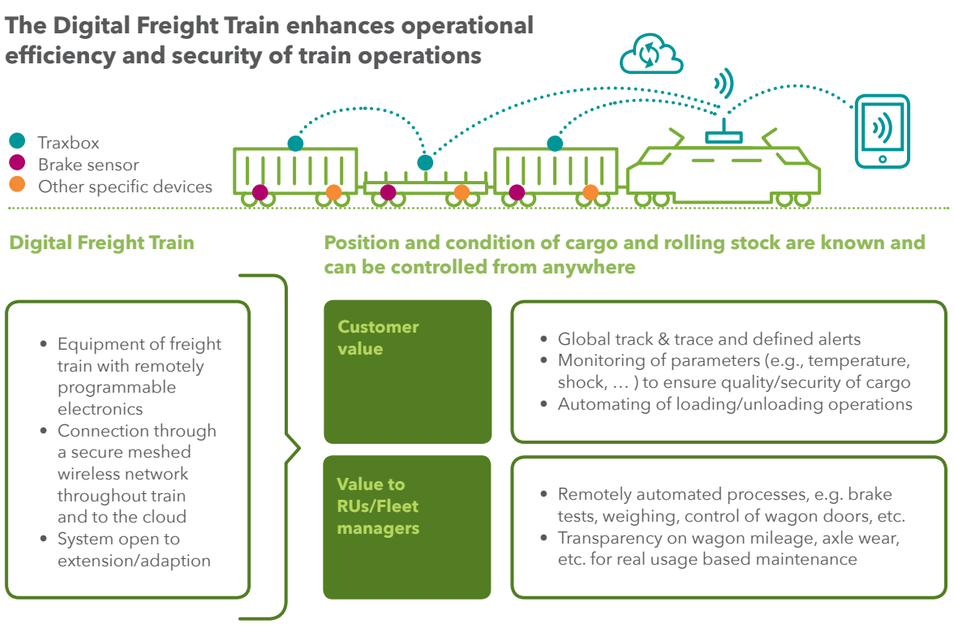


Figure 1: Example Digital Freight Train

Three main areas are defined where is up to the RU's to take up their responsibility:

- To achieve a competitive edge, **the sector will drive automation** of operations. The benefits will be greater reliability, more cost-efficient operations and greater safety;
- The sector will **continue to develop telematics** resulting in intelligent wagons. This will be a major enabler for other products to the customer. It will also allow optimised maintenance schedules leading to an overall lower cost structure;
- The interfaces with customers should become more user-friendly. By **developing customer portals**, the RU's will drive bundling and increase the ease-of-use of the rail solution. These initiatives will benefit a lower order handling cost, thereby increasing the competitiveness of the solution.

The Digital Freight Train enhances operational efficiency and safety of train operations

Position and condition of cargo and rolling stock are known and can be controlled from anywhere

4.1.4 Contingency Management plans for RU's

After the Rastatt[21] incident, the European Commission gathered together the railway sector's stakeholders in order to develop an International Contingency Management Handbook (ICM), which was adopted mid-2018 and which defines the roles and responsibilities of IM's and RU's in case of a major international crisis.

21 Rastatt refers to an incident that occurred in August 2017 due to infrastructure works on a tunnel of the Karls-ruhe-Basel line of the Rhine-Alpine Corridor that paralysed rail freight traffic for a 7-week period and resulted in economic damage of more than €2 billion for the whole industry, impacting all the stakeholders of the supply chain.

The RU's will honour their commitment in implementing their contingency management

The RU's will continue their efforts. Additionally, work needs to be done on 3 pillars:

- Define the communication processes with operators and end-customers;
- Optimise resources - locos, drivers - among competitors;
- Safeguard capacity allocation for freight trains.

The goal for RUs is to find satisfactory solutions for meeting their customers' needs in terms of circulation even with capacity restrictions, also in close collaboration with infrastructure managers and their CM handbooks.

4.2 An infrastructure that supports customer focus

In order to meet the current modern logistic needs, RU's are turning into customer-focused organisations. However, freight operators are very dependent on the reliable service of in-frastructure managers for their offer to their own clients. For their part, infrastructure managers themselves depend on the authorities´ support to become more market-oriented.

In many ways, most of the rail freight sector and infrastructure managers in particular have not come to terms yet with the liberalisation of freight transport, particularly the interna-tional dimension of freight transport. For more than a century the rail freight sector in every country was mainly focused on their domestic market and passing international traffic between them as if it were domestic traffic.

European rail freight is lagging in terms of infrastructure parameters

Comparison of infrastructure parameters

Selected parameters (examples)	EU	North America	Factor
• Average load (net tons)	400	2.500	~ 6
• Max train length (in m)	750	5.000	~ 7
• Axle loads (in t)	22,5	32,0	~ 1.5
• Loading height (in containers)	Single	Double	~ 2
• Average track length in terminals (in m)	400	1.000	~ 3
• Share bulk cargo and containerised freight	50%	70%	~ 1

Figure 9: European rail freight is lagging behind in terms of infrastructure parameters

That is why rail freight has difficulty with the rapid internationalisation of logistics and its customers' requirements. Meeting those requirements demands a mental shift towards an international approach to the main challenge facing every country and its infrastructure managers: how to maximize the use of railways for the transport of passengers and freight.

Infrastructure managers' efforts must continue in four main areas:

- Easy access to the entire European rail network;
- Easy, reliable and fast planning of train paths throughout Europe;
- Easy train operations with real-time ETA and dynamic traffic management in case of congestion
- Standardised, highly available and high-capacity infrastructure for freight without bottlenecks.

These are prerequisites to providing national and international customers with competitive products.

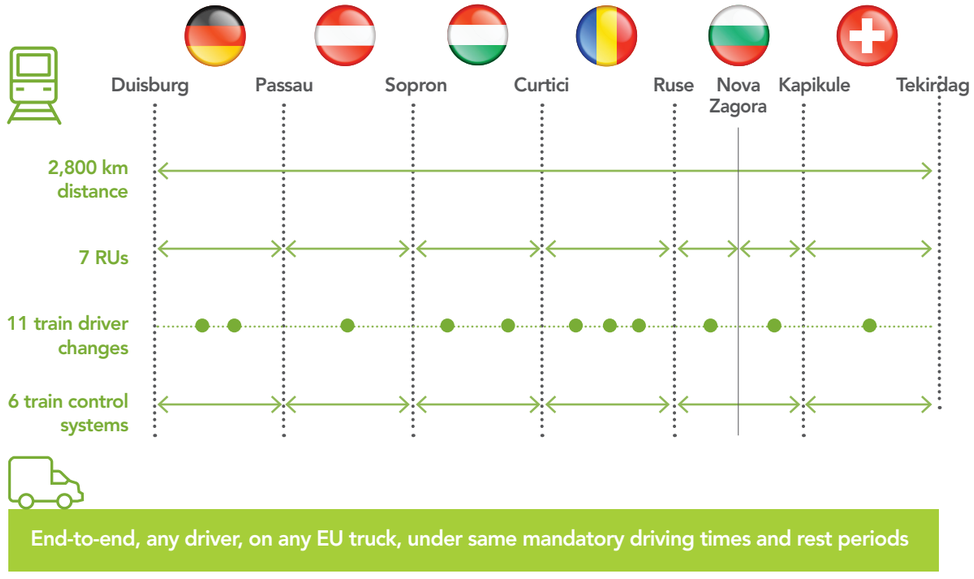
4.2.1 Easy access to the entire European rail network

Twenty-five years of European rail liberalisation has not yet created a single economic area in terms of rail transport. Today, EU legislation provides for a fully liberalised rail freight market. Considerable progress has been made in fostering technical and operational harmonisation of rail markets of all Member States. However, in practice all railway companies, private and public, passenger and freight transport, are heavily penalised due to the lack of interoperability and persistence of national rules.

Still today, in many cases national regulations prevail over European harmonisation. This is leading to inefficiencies, lack of transparency and operational complexity resulting in costly services. Over-regulation and non-harmonisation of infrastructure as well as rolling stock lead to awkward interfaces between countries. To address this complexity, railway

Hence, RUs need to manage tremendous and costly complexity to fulfil customer demands

Complexity of rail freight vs. road operations



Source: Rail Cargo Group

Figure 10: The level of complexity to run a train is a multiple of driving a truck

operators are often obliged to set up structures dedicated to managing these time-consuming procedures.

In contrast to this, other transport modes have gone beyond national boundaries in creating one European area. Even though we will have a solution for a single safety certificate valid across several countries by 2020, many other issues lack harmonisation.

A Single European Railway Area is the target. Just like in the aviation industry, it is the wish of the freight operators for full interoperability to be implemented without compromising safety.

To this end, the sector needs:

- overall standardisation of technical rules and specifications;
- a single authorisation process across Europe (license to operate, vehicle authorisa-tion, train driver license, etc.);
- harmonisation of the networks with fewer national specificities and fewer diverging national rules;
- progressive standardisation of network statements;
- a full and rapid implementation of the technical pillar of the 4th Railway Package;
- a roll-out of the European Railway Train Management System (ERTMS) with substantial funding in line with the MoU of 2016 and the European Deployment Plan of 2017, as well as a clear funding strategy as these investments cannot be the sole responsibility of the Railway Undertakings.

Every operator must be able to introduce new regular services within a much shorter delay than today

4.2.2 Easy, reliable and fast planning of train paths throughout Europe

Improvement in planning rail capacity is necessary. Infrastructure managers should take into account that rail freight transport does not fit into the rigid structure of passenger transport and therefore has special needs. The customers require available, internationally guaranteed end-to-end and economical rail paths.

A rail operator must be able to access a specific and quality international end-to-end rail path within a much shorter time frame than today

When planning a train, rail operators are confronted with challenges that do not facilitate operation:

- delayed final offers or incomplete offers;
- rail paths offered are not always reliable and are sometimes insufficiently reactive to changing circumstances;
- lack of harmonisation at borders, planning of infrastructure works;
- capacity reductions due to extension of fixed maintenance slots AFTER the construction phase;
- divergent ways to include temporary capacity restrictions (not included, no path offer, no harmonisation at the border, no information on changes, etc.);
- divergent train parameters;
- rail paths that do not consider business economics.

Action points

1. An improved dialogue:
   - between infrastructure managers to identify problems of cross-border co-or-dination earlier in the chain to allow more proactive solutions;
   - with its customers, i.e. the rail operators to better understand their needs;
   - with good coordination between railway undertakings and infrastructure managers in the neighbouring countries on planned works and the impact on the (inter)national network.
2. Install visual planning tools, on a European scale, for end-to-end planning.
3. Redesign the user agreement and network statement taking into account the interests of the rail operators with quantifiable KPI's.

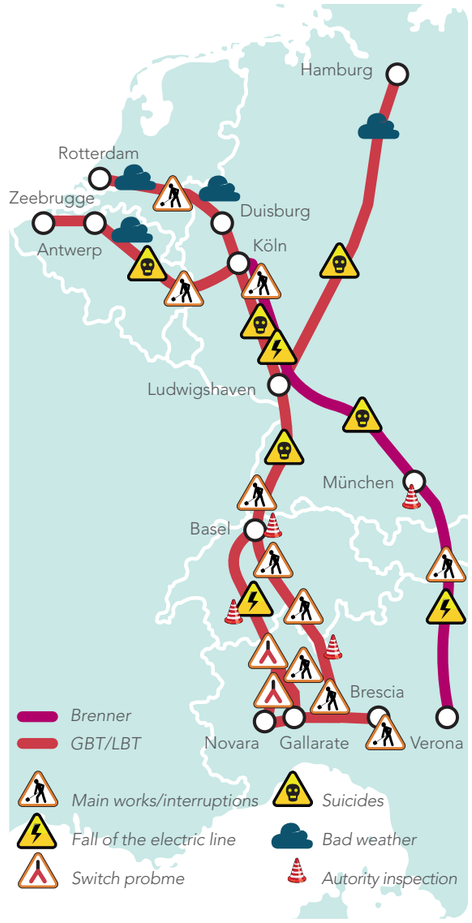


Figure 11: Some of the major Ten-T corridors are suffering from un-coordinated works or interruptions

4.2.3 Easy train operations

In addition to planning, there is a need for improvement in daily traffic management.

In their daily operations, the RU's notice room for further improving the short-term optimisation:

- In most countries, there is insufficient pro-active real-time communication between train drivers and infrastructure managers;
- The priority regulation between operators (high-speed line, passenger transport and only then freight transport) does not take into account other operational parameters;
- Rail paths are often not aligned with real-time use of tracks in railway bundles and shunting yards;
- The debacle in Rastatt has shown that contingency management and disaster management are equally high on the agenda.

Action points

1. Pro-active real-time communication between train drivers and infrastructure managers will enhance a more fluid flow of traffic across the network.
2. Respect priority rules that take into account the optimal flow of traffic to the benefit of all railway users. A freight train running on time should not be de-prioritized when using active traffic flow management.
3. Provide simple, automated processes linking rail paths with track occupation in rail-way bundles and shunting yards
4. Coordinated, dynamic traffic management
5. Anticipate contingencies. We welcome the fact that a Contingency Handbook has been established as a consequence of Rastatt, but its implementation must not be delayed and it must be extended to all other important freight corridors.
6. Install (visual) flow management tools on a European scale to allow real-time ETA. To achieve this, a data management framework has to be developed that supports transparency and visibility throughout the chain. New technologies with real time data exchange and connected networks should play an important role.

In order to safeguard our competitive position, rail-way operators strive for reliability in line with market needs

4.2.4 Infrastructure design parameters need to be adjusted in order to accommodate growth without major investment

By 2030, rail freight companies want to take a 30% modal market share. In reality, this means transporting more than double the current volume of goods. However, it does not mean that we need to double the physical infrastructure for rail. Additional capacity can be found through optimisation. If the physical design parameters are adjusted, most of the growth can be absorbed without major investment.

Provide sufficient capacity and quality rail paths for rail freight to accommodate its growth

Action Points

1. 740 m trains with PC400 as standard throughout the European freight network. In-crease to 1 000 m as next step
2. Network-wide roll-out of one ETCS-standard by 2030
3. Elimination of bottlenecks on European corridors, in hubs and terminals
4. High availability of infrastructure at design specifications
5. Speeding-up of planning/construction, procurement of sufficient/predictable funding

The biggest investment in physical infrastructure will be on the implementation of TEN-T guidelines, the gauge and the completion of missing links.

4.3 The policy makers and authorities should ensure a stable regulatory framework and a level playing field for rail and all other modalities to nudge customers towards rail

4.3.1 A stable regulatory framework

In order to support a modal shift, the Railway Sector needs a stable legal framework with fair operating conditions. The completion and implementation of the current regulations takes time and is currently being conducted at national level. Therefore, shippers and the whole supply chain industry will feel more confident about having a long-term vision thanks to a stable framework and no additional regulation.

Instead, it requires national policy makers and authorities:

- to think international
- to assist the infrastructure managers in the realisation of their mission
- to challenge their infrastructure managers on their achievements and provide for KPI's in their general framework agreement.

4.3.2 A level playing field

Freight transport by rail is economically efficient, but is still confronted with an unequal playing field compared with other modalities. It is a well-known fact that competitiveness increases the greater the distance, but it has also been shown that the tipping point can be reached on shorter distances. The following measures will considerably lower that tipping point and will encourage shippers to shift freight from road to rail.

4.3.2.1 Reduce differences in internalisation of external costs

Road transport is much cheaper because a very large portion of the external costs are not borne by the user but by society. It is the task of policy makers to correct these distortions. This can be done by imposing additional taxes on road transport by introducing compensation for alternative modes and/or by encouraging road transport to use alternative modes. Transport policies must include environmental objectives in the development of price mechanisms.

Implementing a compensation policy is relatively easy to finance. An important part of the external costs of transport could be internalised by road charges or carbon taxation, which in turn can be used to stimulate the use of transport modes with the lowest external cost.

4.3.2.2 Reduction of the Track Access Charges (TACs)

Rail has to pay for every kilometre of track used, whereas this is not the case for road and waterways. Ninety-nine percent of roads in Europe are not subject to any toll.

The result of a survey on 'Support Measures for Rail Freight' which the European Commission carried out among Member States in May-July 2018 shows that 'the reduction of Track Access Charging has an immediate impact on the competitiveness of rail freight and on the rail freight modal share'. Current levels distort the level playing field across modes, as other modes are not subject to the same infrastructure charging rules as rail. In addition, the non-harmonised and non-coordinated TACs across countries result in suboptimal and non-transparent operational choices. However, infrastructure managers will only be able to harmonise and reduce TACs if counterpart financing is provided by parent authorities in the same way as this is done for most road infrastructure.

4.3.2.3 Reduce administrative costs

The regulatory framework has reached a point where railways need it to remain stable in its fundamental traits. The upcoming years will have to be used to enforce what is in the law today.

The work of the legislator should therefore concentrate on other non-rail fronts, and in particular it should be aimed at redressing those cross-modal regulatory asymmetries that today hinder intermodal competition:

- The training programme for train drivers takes much longer than for truck drivers. The more complex environment can only partly explain the difference. It is strongly linked to the lack of a harmonised technical and operational environment.

Road has 6x higher external costs that rail

Comparison of average external costs in EUR/1,000 ton-km; EU 27[1], 2008, excluding congestion

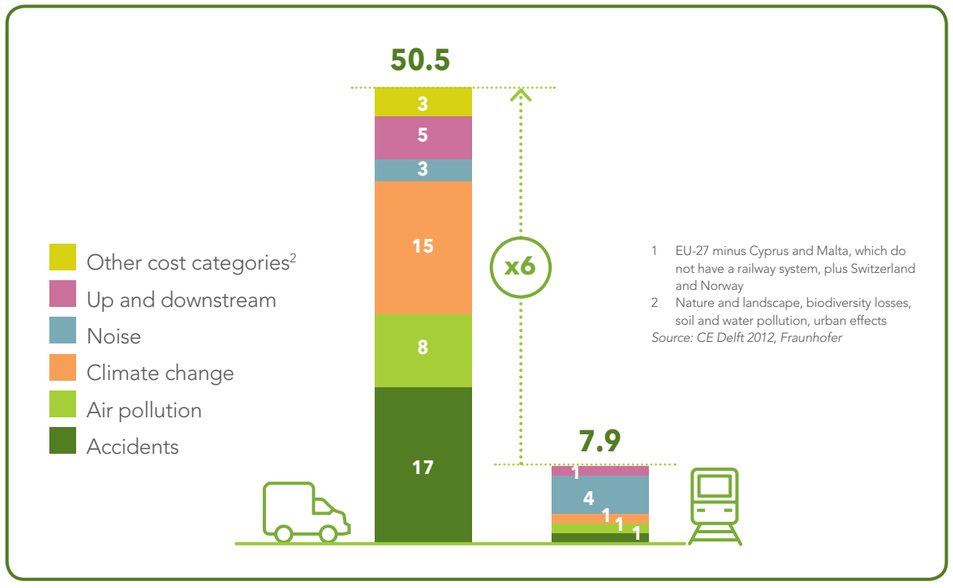
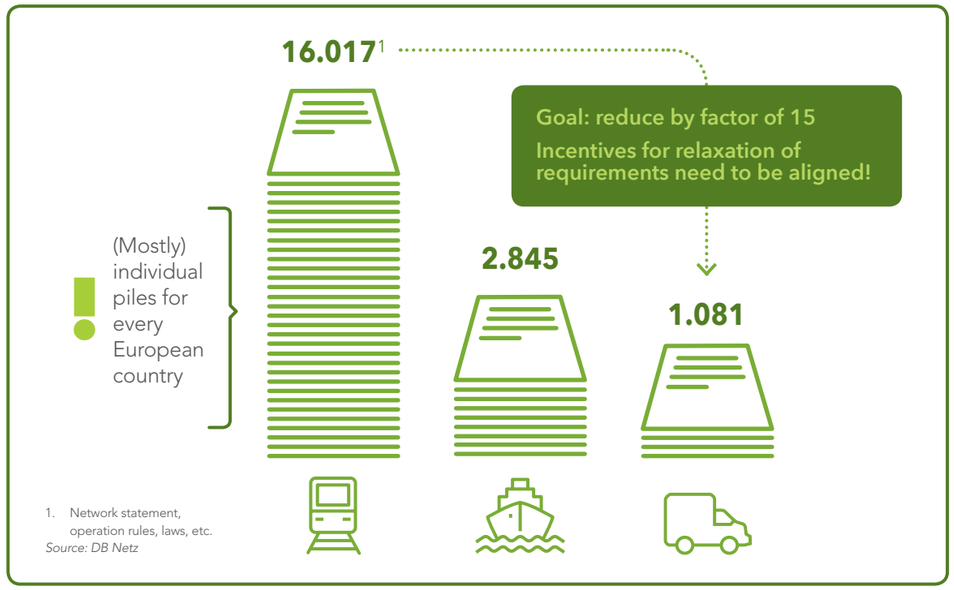


Figure 12: Significant difference in environmental performance (up to 40 times better) leads to significant difference in external costs

Requirements/regulations for operating freight trains incur high cost and should be simplified/reduced by a factor of 15

Relevant rules/regulations to operate on transport infrastructure in number of pages, Germany



- The authorisation procedures for locomotives have a greater administrative burden than those of trucks, because there are large differences between countries' requirements for locomotives due to the diversity of the networks;
- The persisting system complexity creates an unnecessarily large overhead structure;
- Differences in tax treatment of energy;
- Differences of treatment between road and rail regarding E-Customs procedures.

We call upon transport policy to eliminate these barriers. The rail sector is committed to reflect these cost-reduction elements in the market prices offered.

4.3.2.4 Burden-sharing of safety cost

Even though rail freight is almost 85 times safer than road transport, RU's have to absorb an unequal share of new safety investments without business benefits. Authorities have to provide sufficient funds for the incurred RU costs (e.g. ETCS OBU) taking into account the benefits for IM's and their financing by the Member States in the long term.

4.3.2.5 Cost-benefit analyses of infrastructure investment taking into account all societal benefits

Taking into account all the societal benefits of railways, authorities should provide sufficient funds for standardisation of easy-to-use infrastructure and increase of needed capacity. To-day, priority rules are used as a customary way of managing traffic, although the rationale behind the priority rules was originally to face exceptional traffic circumstances. The systematic resort to priority rules during day-to-day operations is a symptom that the system is stretched to its limits. Public investment in rail infrastructure should come even more naturally, given that rail gives huge societal benefits for this investment compared with roads.

The same goes for spatial planning and industrial policies promoting the bundling of cargos, such as the development of freight villages / industrial parks and their connectivity with rail.

4.3.2.6 Support Measures to Last Mile Infrastructure

The result of the Commission's 2018 survey on "Support measures for rail freight" shows that Member States where single wagonload still exists tend to have a higher rail modal share than others. This pleads in favour of specific measures to support single wagonload at national level and last mile infrastructure.

4.3.2.7 Support innovation

The digitisation of rail requires huge investments for RU's. Until the above measures are in place, RU's will not be able to generate enough profits to fund R&D on the required indus-trial scale. This is why the portfolio of financing by CEF and S2R grants remains extremely important.

5 Our commitment to a high-performing multi-modal logistics industry

Our vision is to transform rail freight into a high-performing, efficient and sustainable back-bone transport system for a European multi-modal logistics industry.

All railway undertakings together with policy makers, regulators and the infrastructure managers are able to achieve this, for the benefit of all.

With the implementation and the achievement of the above actions and objectives, RU's will be able to engage in:

1. doubling the current volume of goods transported by rail, thereby taking 30% of modal share, enabling growth without congestion and reaching climate targets;
2. delivering reliability in line with market needs;
3. investing significantly in innovation in order to reinvent rail.

6 Conclusion

This European Rail Freight Vision 2030 by Railfreight Forward, a coalition of most of the rail freight companies in the EU with the support of CER, UIC and VDV, defines a clear ambition for a modal share of 30% rail freight by 2030. We believe it is the best macro-economic solution for European economic growth. Our vision is to transform rail freight into a high-performing, efficient and sustainable back-bone transport system for a European multi-modal logistics industry. Without it, the EU's economic development will be stifled by congestion, pollution and climate change.

The realisation of this ambition requires decisive action not only from rail undertakings but also from infrastructure managers, policy makers and authorities. The Vision 2030 goes beyond the current policy papers and sector statements in place as a follow-up to the 2016 TEN-T days, and the declarations of the railways and member states. RailNet Europe (RNE) has risen to the occasion in producing this vision. Nevertheless, its implementation remains difficult. We hope that the EU Commission, the member states and the infrastructure managers will embrace this ambition too and work with us in a three-way dialogue to make it happen.

By changing the way of doing business with more multi-modal solutions and by putting the pre-requisites in place, the European rail freight sector is convinced that this ambitious target of 30 by 2030 is achievable.

If we succeed, Rail Freight Forward will be Rail Forward by 2030!

An initiative of the Rail Freight Forward coalition

Rail Freight Forward is a coalition of European rail freight companies which are committed to drastically reducing the negative impact of freight transport on the planet and mobility through innovation and a more intelligent transport mix.

The coalition has the ambition to double the modal share of rail freight to 30% by 2030 as the macro-economically better solution for European growth. It strives to engage railway undertakings, infrastructure managers and policymakers across Europe in acting to realise this modal shift.

Rail Freight Forward is a broad and continuously expanding coalition composed of rail freight operators and supported by the sector associations CER, UIC, ERFA and VDV.

www.railfreightforward.eu

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