Mega-trucks versus Rail freight?

What the admission of Mega-Trucks would really mean for Europe

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Contents

Introduction

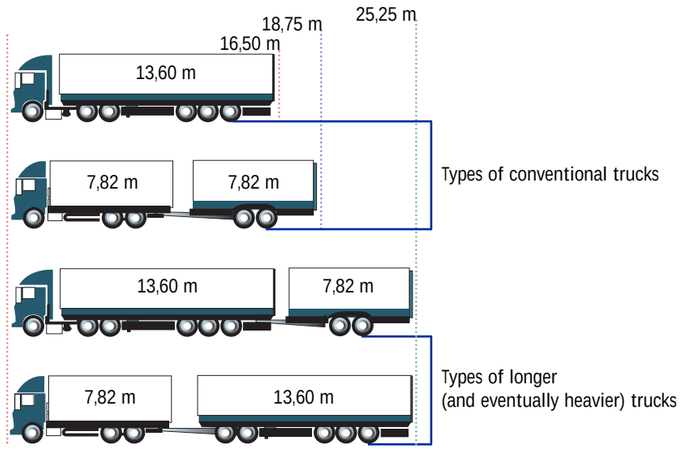
The debate over the possible European-wide admission of mega-trucks, exceeding the length and weight standards currently in force, is reopening. More specifically the central issue is whether longer and heavier road vehicles (be they labelled “monster-trucks”, “mega-trucks”, “gigaliners”, or “ecocombis”) measuring up to 25.25m in length and weighing up to 60 tonne should be allowed to operate on European road infrastructure.

This prospect obviously raises serious questions, some relating to the workings of the road freight transport market in Europe, others to the possible impact of mega-trucks on transport policies and on sustainable development, at the very moment when the question of climate change and of road-transport responsibility is becoming the most challenging issue of the day.

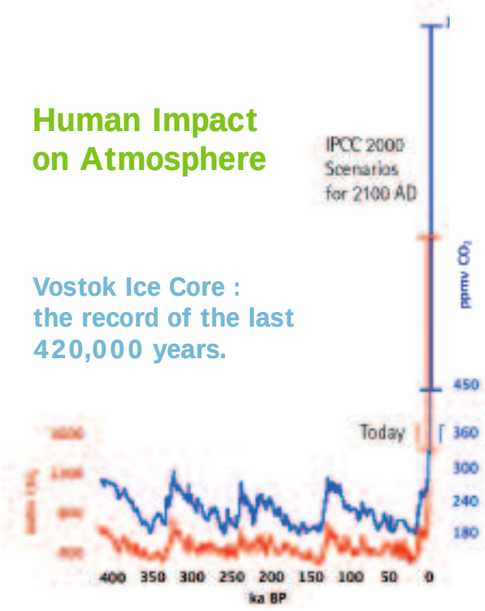
The rail sector cannot be indifferent to this discussion. One of the sector’s primary political concerns is a level playing field and fair competition between all modes of transport. Today, competition is distorted by a lack of transparency, regarding the costs to society generated by each transport mode, such as pollution, noise, congestion or accidents. As long as these “external costs” are not taken into account, the competitiveness of rail transport will be hampered as compared to other transport modes, road transport in particular. At a time when ongoing discussions on the “Eurovignette” Directive wish to solve this problem, allowing mega-trucks would have a disastrous effect.

The rail sector asks the responsible authorities not to look at this issue in a simplistic and short term way, but to take into account the “dynamic effects” of mega-trucks and the consequences of their introduction on more sustainable transport modes.
When adopting such an approach, the supposed advantages of mega-trucks rapidly turn into major threats for the EU’s transport policy. In the medium and long term, studies show that mega-trucks would shift freight transport from rail back to road, thereby resulting in a considerable increase of CO_2 emissions from transport.

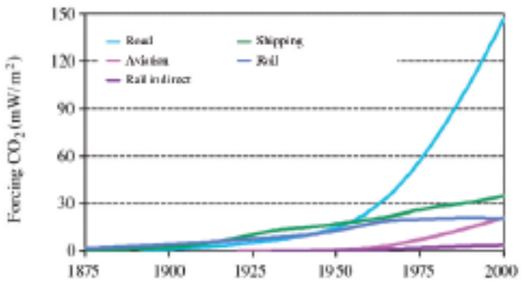
Significant investment in road infrastructure (e.g. dedicated parking areas, new lanes on motorways, widening of roundabouts, etc.) would be needed to adapt the existing road network to mega trucks, at a time when railway investments are a priority. Investments in railway infrastructure, including funding to better connect railway and road, would have to be re-directed towards these “upgrades” of the existing road infrastructure.



Human Impact on Atmosphere



Contribution to climate change by different transport sectors



Source: Figure 1b in Fuglestvedt, J., T. Berntsen, G. Myhre, K. Rypdal and R. B. Skeie (2008). "Climate forcing from the transport sectors." Proceedings of the National Academy of Sciences of the United States of America 105(2): 454-458.

Allowing mega-trucks on European roads would therefore contradict the current efforts made by both EU decision-makers and the rail sector to promote a ‘modal shift’ from road to rail freight, ensure continuous investments in rail infrastructure and level the playing field between different modes of transport. As climate change is on everyone’s minds, such a move would be a major step backwards, which would harm not only the competitive position of the rail sector but also society as a whole.

To sum up, allowing mega-trucks to circulate on European roads would have two major consequences:

- It would inevitably produce a shift from rail back to road, both in terms of freight quantities and investments, since infrastructure investments will need to be focused on upgrading roads to be adapted to these new vehicles;
- Such a short-eyed strategy would allow one particular transport mode to optimise its costs at the expense of the society as a whole, by increasing CO_2 emissions and creating more imbalances between different transport modes.

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1 The legislative and regulatory framework

According to European law (Directive 96/53/EC), Member States are entitled to allow longer and heavier trucks (the so-called "modular concept") to circulate in their country, provided that this does not affect international competition. This Directive does not allow international transit. Until recently, only Sweden and Finland made use of this possibility. The specific conditions (long distances, low population density) of those countries allowed the circulation of these trucks.

However, public authorities are increasingly concerned about the forecasted growth in transport (these forecasts see a 50% growth in transport by 2020). Among the many ways to absorb this growth, increasing the currently allowed dimensions of road vehicles seems, at first glance, to be a possible solution. For this reason, some European countries with totally different geographic characteristics than Sweden and Finland are currently looking into this option:

- In The Netherlands two pilot projects were carried out in 2000-2003 and 2004-2006. On 1 November 2007 an "experience phase" started, which will last three to five years.
- In Denmark a trial scheme started in January 2008;
- In Belgium the government has indicated that it was interested to start trials in Flanders.

However, it is important to note that other countries have decided against mega-trucks. On 10 October 2007 the conference of German transport ministers decided, after trials with mega-trucks had taken place in several Länder, that not only would they not allow the circulation of trucks of 25 metre and 60 tonne; they also rejected the "light" option of 25 metre and 40 tonne.

And also another major European country decided recently against the introduction of mega-trucks: On 3 June 2008 the British Department for Transport rejected the proposal to introduce longer and heavier trucks on British roads, following the publication of an independent report. According to British Transport Secretary Ruth Kelly, mega-trucks are not compatible with British roads. "Not only are there clear environmental drawbacks, but such vehicles would be unsuitable for many roads and junctions, while providing the infrastructure to accommodate them would require substantial investment."

Only one argument in favour of mega-trucks: Capacity increase 2

As can be expected, transport stakeholders and public authorities do not share unanimous views on whether mega-trucks offer advantages or disadvantages. One part of road-sector stakeholders – in particular truck manufacturers and hauliers- readily point to a series of advantages made possible by mega-trucks, whenever and wherever they are allowed to operate. Actually capacity increase is only one single argument, which would lead to a number of improvements for the road-sector.

They rest their case in particular on:

- increased transport capacities (payloads) made available for a minimal extra financial outlay;
- a more rational use of road and motorway capacities (asserting that each mega-truck offers roughly one-third extra payload capacity), hence a reduction or stabilisation of the number of conventional trucks on the roads (though this would only be true at constant traffic levels, an unlikely scenario);
- road unit costs (cost per available tonne-kilo-metre) reduced by 20-25% over long-haul runs, according to the UIRR survey. This, however, would only be actually beneficial if these outsized trucks were to always, carry their maximum load;
- a further claim is that the same freight volumes can be moved using fewer road vehicles. This would, nonetheless, require more logistics centres to distribute the goods brought in by these trucks (deflating the second argument above).

3 The reality? Allowing mega-trucks triggers a dynamic process

As stated above, supporters of mega-trucks claim that two mega-trucks could transport what is now transported in three normal trucks. This would then mean that fewer trucks would be on the road, with resulting benefits for CO_2 emissions, congestion and road safety. But this is a simplistic and short term way of looking at it. What also should be taken into account are the medium to long term effects. It is beyond question that allowing mega-trucks would result in higher productivity and thereby in better prices for road hauliers.

As a serious consequence of this though, it would trigger a dynamic process whereby freight would to a large extent be shifted back from rail to road.

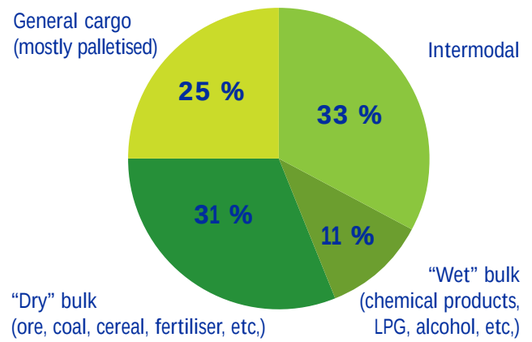
In Germany alone (cf. study of "K+P Consultants"), it would translate into some 7 billion tonnes-kilometres being switched from rail to road, so generating an extra 400,000 truck journeys in this country. This development, by taking us back to the road-rail modal split of the 1990s, would be tantamount to cancelling all the efforts deployed over the past two decades to bring the transport market back into balance and promote a sustainable transport policy in Europe. The study conducted by TIM Consult/UIRR/Kombiverkehr in 2006 estimates the consequences for combined transport in the event of longer, heavier trucks being introduced in Germany, with a predicted shift of more than 55% of combined transport volumes back to the roads! These two surveys do not incorporate the impact on the wagonload business which would be negatively affected just as severely. And these studies also come to the conclusion that, instead of merely transferring goods from rail back to road, it would create a new transport demand, leading to even more trucks on the road. Therefore, instead of the expected benefit from mega-trucks in delivering reduced congestion, CO_2 emissions and improved road safety, the contrary would happen.

Some do not share the conviction of the rail sector that mega-trucks would jeopardise rail market share. They argue that road and rail do not transport the same type of goods: rail traditionally transports low-value goods over long distances, while road hauls higher-value goods over shorter distances. This is a mere myth: rail companies nowadays transport all kinds of goods, not only bulk goods, as can be seen in the graph below. Container transport (with high value goods) is nowadays one of the fastest growing markets for rail freight. And especially by allowing road transport to improve their efficiency and therefore to lower their costs, road transport will become cheaper and exactly as a result of this, will be able to directly compete in the market segment of bulk goods.

As mentioned above, especially combined road-rail transport (co-modality) would be affected. In this market segment trucks are responsible for the transport from and to the terminals, with rail taking care of the main, long-distance leg of the journey. Mega-trucks would be able to directly compete with rail on this section, which could mean the end of a transport segment, which has been characterised by a very high growth potential, and which has been promoted by public authorities in recent years.

Allowing mega-trucks and increasing road transport's attractiveness would be inconsistent with the efforts undertaken by the European Union and national governments to promote intermodality, co-modality and the development of combined transport (to capitalise on best possible synergies between modes).

Volume in % per type of goods



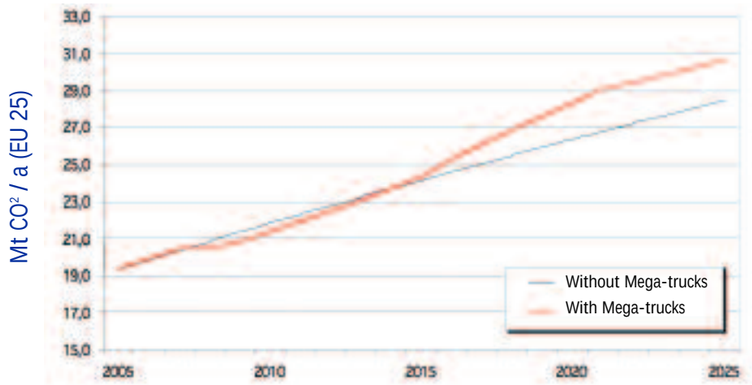
Source: Rail Cargo Information Netherlands, Spoor in cijfers 2007

4 Consequences: The effects on CO_2 emissions

It is a fact that rail is up to five times more environmentally friendly than road, and a shift of freight from rail to road will therefore have serious consequences for the environment. A study by Claus Doll of the Fraunhofer institute looks into this "dynamic effect" in relation to CO_2 emissions in more detail. It investigates whether the expectation, put forward by opponents of mega-trucks, that the modal split generated from lorry combinations with considerably higher size and weight limits would outweigh and even over-compensate their initial gain and CO_2 efficiency.

The study comes to the following conclusions: even under the cautious assumptions taken by the study as a starting point, the result of the exercise clearly shows that the efficiency benefits of mega-trucks are counterbalanced by a number of effects. The most important of these effects is the shift of demand from rail (and waterways) to road due to extended size and weight limits and to lower transport costs.

Annual CO_2-Emissions with and without Mega-trucks



Source: Rebound Effect of Climate Benefits from Mega-Trucks, Claus Doll, March 2008

This trend is also clearly marked in the case of lighter trucks, for instance of 25 metre but 50 tonne.

The graph above clearly shows that, while mega-trucks may offer benefits when it comes to CO_2 emissions in the short term, these benefits disappear in the medium to long term, when the modal shift from rail to road becomes apparent.

Such an evolution would contradict the EU objectives of reducing greenhouse-gas emissions by 20% between 1990 and 2020, which are unanimously agreed by the European Commission, Parliament and Heads of States. It would also fall short of achieving cleaner, smarter and safer transport in the protection of the environment and the fight against climate change as requested in March 2008 by the European Parliament in its initiative report on Sustainable Transport Policy. As underlined by the 2008 report of the European Environmental Agency (EEA) "Climate for a transport change", the objective to reduce greenhouse-gas emissions is indeed unlikely to be met without a strong reduction of the transport sector's CO_2 emissions. Allowing mega-trucks to run on European roads would, on the contrary, result in a significant increase of CO_2 emissions from transport.

Source: ecotransit.org

A simulation on http://ecotransit.org was done to compare energy consumption and CO_2 emissions between Stockholm and Malmö by train and by 60-tonne truck for 1000 t of heavy goods. The good performance of rail is clear, and is also confirmed with other emissions (Nitrogen Oxide, Particles, and Non Methan Hydro Carbons) which endanger human health.

5 Consequences: The costs of infrastructure enhancements

The introduction of longer trucks and their proliferation necessarily imply enhancements to the existing road infrastructure, which would bring about additional costs (these costs have for instance in Germany been estimated at € 4-8 billion):

- new roads have to be constructed to a different, more costly specifications,
- eventually, a dedicated extra lane for Mega-Trucks will have to be provided for on the busiest motorways,
- the widening of roundabouts, access lanes, etc., would be required,
- at the road/rail interfaces: upgrading of level-crossings (design, dimensions, safety equipments), road-over-rail bridges,
- many motorways, parking areas would have to be enlarged (in Germany, for example, they already have reached the point of saturation in many places),
- most terminals and logistics platforms on the outskirts of population centres would have to be restructured, not to mention all the work needed on the access roadways.

The admission of heavier trucks would additionally imply the costly upgrading of many civil engineering structures (experts have mentioned the risks posed by bridges built in the 1970s and 1980s, based on extremely different load scenarios).

These enhancements and upgradings would impose heavy additional expenditure on the public authorities (the European States, regions, local governments).

Corresponding investments will have to be undertaken, which will be, due to limited budgets, to the detriment of other transport-infrastructure projects (such as rail-based, more environment friendly and sustainable urban and suburban public transit systems).

At the same time, the available public budgets for infrastructure investments have decreased significantly over the past years: EU Member States which invested on average 0.45% of the Gross Domestic Product in transport infrastructure during the 1980s, today spend less than 1% for these investments.

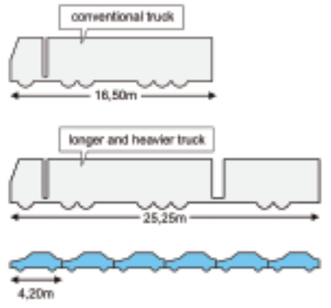
6 Consequences: A major impact on transport safety

Studies following the German trials conclude that the heavier vehicles are considerably more dangerous when involved in collisions.

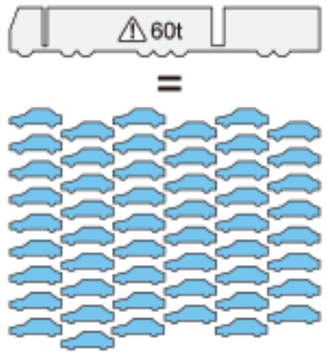
The main risks in road traffic are:

- the co-existence of long, heavy road vehicles on the one hand, and passenger cars and motorbikes (vulnerable users) on the other hand (with a strong speed differential);
- necessity to dedicate slow lanes to mega-trucks (which virtually implies depriving slower cars, of one lane);
- overtaking risks (overtaking between 'conventional' trucks and mega-trucks, passenger cars and other truck types, etc.);
- risks intrinsic to the behaviour of these mega-trucks in road traffic: sensitivity to cross winds when moving, handling difficulties (even with specific assistance systems), braking distances, visibility problems, generally and specifically in terminals or parking zones;
- safety at level-crossings and more generally at all road/rail interfaces (road-over-rail bridges, etc.);
- increased gravity rate (fatalities) of road accidents involving longer and/or heavier trucks.

Introducing mega-trucks onto congested road and motorway networks (particularly in major production and consumer areas, port regions, etc.) poses new types of risks in terms of road safety.



Mega-trucks are...
... as long as six cars



... as heavy as 52 cars

A Boeing 737-300 that is fully loaded and carrying its maximum of 127 passengers weighs a maximum of 57.6 tonnes at take-off, making it lighter than a mega-truck

Source: www.nomegatrucks.eu - <http://www.nomegatrucks.eu/>

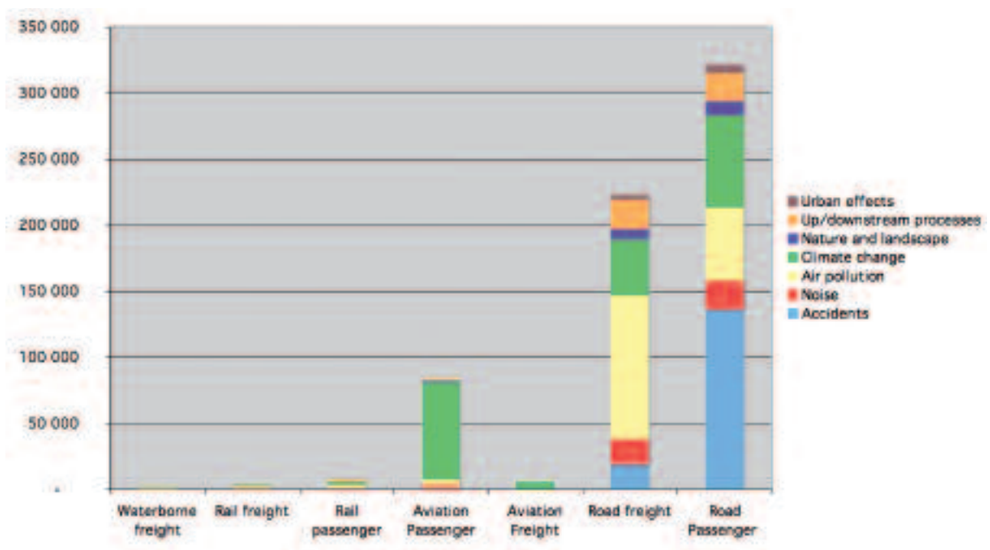
7 Consequences: The true costs of transport increase even more

The costs of infrastructure modifications, increased road safety risks and more goods transported by road instead of rail would have a negative impact on what the taxpayer has to pay for transport, if one includes the external costs to the bill.

Today, the price of transport does not reflect the true costs it generates, in particular the external costs. These are the costs that transport users impose on society and which are financed by the society as a whole. They mainly involve climate change, air pollution and accidents, but also take into account congestion and noise. A study by INFRAS/IWW (October 2004) estimated the total external costs for 17 European countries at € 650 billion in 2000, or a massive 7.3% of GDP (not including congestion).

Total external cost per mode and externalities for 2000

Million of Euro per year



Source: INFRAS/IWW

Most of these costs (80%) are attributable to the road sector. In view of this situation, any moves to encourage the introduction of mega-trucks would simply add to the financial burden to be borne by society, financed by the taxpayer and benefiting only a few transport companies. For example, a study done by Oxera for the UK market in May 2007 comes to the conclusion that the increase in external costs caused when freight ceases to use rail and is moved by mega-trucks instead, more than offsets the benefit of using mega-trucks instead of normal trucks. Whereas moving from 'regular' trucks (HGVs in the table below) to mega-trucks (LHVs) would seem to reduce the external costs, this analysis proves to be untrue when taking into account the switch from rail to road which would result from the introduction of mega-trucks. The additional road freight movement generated by mega-trucks will in fact cost over £900m (or €1131m). These costs are not likely to be met by those who pay for road haulage at the point of use, but must instead be borne by society.

It is crucial today to move towards sustainable mobility, promoting the use of transport modes that are kinder to the environment, such as railways (with external costs equivalent to only 2% of GDP).

In this context, the railway sector welcomes the recent proposal from the European Commission on the revision of the Eurovignette Directive, which offers greater flexibility to Member States to incorporate external costs when setting the level of road tolls.

Impact of LHVs on the external costs of UK freight transport

CHANGE	COST (£M)
Switch from HGVs to LHVs	-44
Switch from rail to road	+71
Road freight generation	+907
Net overall impact of LHVs	+934

Source: Oxera The Road, Rail and External Impacts of LVHs', May 2007.

The European rail sector is currently making huge efforts in order to improve attractivity and competitiveness of its products, particularly in freight, and contribute to more sustainable transport activities. In this context, encouraging the admission and proliferation of mega-trucks on European roads is certainly not compatible with the vision of a more sustainable transport market.

8 Rail stakeholders are all committed to offering attractive and competitive services in the field of combined transport and rail-freight

As a result of the efforts made to improve product competitiveness, quality and reliability, rail-based combined transport is currently enjoying significant growth annually averaging 6.8% in Europe.

This surge is encouraged by the European Union bodies, and opportunities for further progress are being explored through:

- the definition of a priority freight network;
- the development of corridors, and capacity improvements (e.g. the UIC Diomis project);
- the implementation of interoperability (operation with ERTMS train control and communication system, etc.);
- the rationalisation of wagon-fleet management in Europe;
- harmonisation in freight telematics (European technical specifications for interoperability in freight telematics – 'TAF-TSI');
- a large number of further projects related to optimisation of efficiency and quality in international rail freight business;
- the efforts of the rail sector to improve their (already very good) environmental performance (CO_2 reduction commitment, noise reduction, etc.).

In this context, promoting introduction of new and, seemingly, especially attractive, but outsized road transport units would most assuredly send the wrong message to the freight market.

Worse, the introduction of mega-trucks would constitute a negation of the measures initiated by numerous key leaders to create a European transport landscape more attuned to customer expectations.

The main reason for allowing these trucks on European roads is to absorb the expected growth in transport. However, as seen above, instead of reducing road transport, it would even increase the number of trucks! Far from resolving the expected problem, mega-trucks would even make it worse.

Instead, it would be better to focus on other solutions to control transport growth, for instance by:

- the introduction of a genuine infrastructure 'user fee', set at a suitable level for road transport,
- more globally: the internalisation of external costs,
- the harmonisation of working conditions, such as between transport modes, and the effective monitoring of their application by road transport operators.

In addition, the rail sector calls upon the authorities to contribute to the development of the European rail network, with coordinated investments programmes between Member States, full interoperability and increased capacity for rail freight.

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