European Modular System (EMS) Paper

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Management Summary

Introduction
This report discusses the introduction of 25.25 meter trucks. Introducing this type of vehicle into today's transport system would constitute a major step in making international road transport more efficient. It could make a strong contribution to Europe's objectives concerning a sustainable transport system. It is a manner in which to accommodate the increasing transport demand that is related to economic development and toward mitigating negative external effects.

The Challenges Ahead
The European Union is currently confronted with enormous challenges in the transport sector. Economic development is expected to increase transport demand by over 50% between 2000 and 2020. Despite the financial crisis that caused transport volumes in 2009 to decline to the level of several years back, experts agree that this forecast volume will be reached again by 2014. This means that there is still an urgency to take the necessary actions to: reduce energy use, reduce congestion, reduce emissions from transport and to improve road safety.

Flexible Transport Systems
The challenges that lie ahead clearly require decisive action. After many years of political modal shift policies it has become clear that promoting other transport sectors over road transport is insufficient action when facing these challenges. The key instrument that has been used toward improving efficiency in transport over the past decades has been economies of scale, i.e by using larger ships and longer trains. Directive 96/53/EC has, however, discouraged the use of 25.25 trucks in European international transport. Using longer and heavier trucks has been accepted in Sweden and Finland for many years and experiments in other countries such as the Netherlands and Denmark have provided examples of good practice.

To facilitate economies of scale, an argument could be that the road transport sector be allowed to also use larger, i.e. longer and heavier trucks. As society relies heavily on road transport we should be critical about the introduction of larger vehicles. The adoption of larger vehicles in a road transport system that is shared with a large group of different users (such as cyclists, pedestrians and motorists) results in societal concerns being more important for road than for any other modes, which is fair. However, the 25.25 truck will circumvent town centres and will only be used in transport between distribution centres located at business parks or industrial areas, on the outskirts of towns and villages. Furthermore, the initiative for introducing larger vehicles should not be inhibited by the illusion that other modes must be protected. In fact, competition takes place only in a limited part of the transport market. Additionally, rail and inland waterway transport do not have the capacity to absorb the transport demand that is facing Europe in the near future. Europe needs a transport system with more flexibility with regard to weight and volume. The 25.25 truck is an essential instrument in this ambition.

Longer Freight Vehicles

The maximum vehicle dimensions for international freight vehicles are laid down in Directive 96/53/EC. The more important are: a maximum length of 18.75 meters for vehicle combinations with a draw-bar construction and 16.50 meters for semi-trailer combinations; both with a maximum Gross Vehicle Weight (GVW) of 40 tonnes.

The European Modular System (EMS) is a concept of allowing combinations of existing loading units (modules) in longer vehicle combinations to be used on predefined parts of the road network. However, concerning the often mentioned maximum vehicle dimensions: neither 25.25 m length nor 60 tonnes weight is mentioned in Directive 96/53/EC.

25.25 Trucks are an Excellent Solution

There are many compelling arguments in favor of the 25.25 trucks:

- Road safety will improve
- Less greenhouse gas emissions
- Road wear is not expected to increase significantly
- Competitive advantage according to the Lisbon strategy.

Trials Show: Many Volume Sensitive Goods

The 25.25 trucks have been allowed in Sweden and Finland for many years and in the Netherlands there is significant experience with these vehicles. All applications show that a reduction in the number of trucks and in fuel use is achieved without undermining the competitive position of the rail and inland navigation sectors. The vehicles are often used for voluminous goods such as stone wool, consumer goods and express deliveries. There are also good experiences in the deep-sea container market, but additional investments in these vehicles aren't expected before cross-border transport is allowed, which may in turn lead to investments in 25.25.

Time to Decide: Experience through International Trials

Directive 96/53/EC regulates the weights and dimensions of heavy commercial vehicles within the territory of the European Union. The Directive has been in force for thirteen years, and may have reached its limitations, it risks becoming a barrier to the natural growth of the freight transport market. As this paper makes clear, the arguments in favor of allowing 25.25 trucks on international European roads are compelling. Most of the objections that have been made during the past years, however, have been significantly overstated:

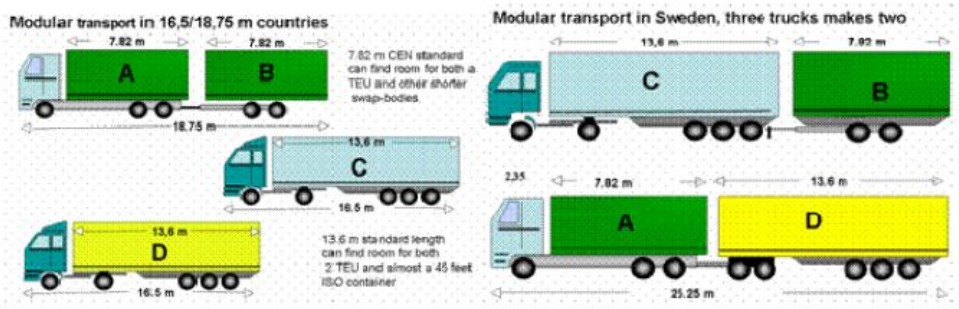
- Co-modality is not endangered by 25.25 trucks
- Road safety is not affected
- Road wear is not increased.

On the contrary, more efficient road transport is needed. Rail and inland waterway transport do not have the capacity to absorb the transport demand that is facing Europe in the near future by far. Allowing trials with 25.25 trucks in the express market would constitute a very low risk experiment: there is virtually no competition from other modes in this market and the vehicles will not be heavier than conventional trucks.

1 Introduction

EUROPEAN MODULAR SYSTEM (EMS)
The modular concept is a vehicle configuration consisting of combined EU-directive vehicle modules. A major advantage of the modular concept is that it doesn't result in capital destruction because it is a reconfiguration of existing modules. The modular system makes it possible to minimize the number of transport movements, simply because three trucks can be replaced by two (see figure 1.1). Since most products transported by road are volume sensitive, the extra length of a truck is more important than the extra weight capacity. Therefore we introduce the 25.25 which is based on the EMS standard with a truckload of 46 tonnes.

Figure 1.1 EMS: 3 becomes 2



This report discusses long and/or heavy vehicles (LHV). Introducing LHVs to the European transport system would constitute one of the major steps toward making international road transport more efficient. In this way LHVs could contribute to Europe's objectives of developing a more sustainable transport system that can accommodate the demand that is inevitably linked with economic development, whilst minimizing the negative external effects. As with any significant innovation there is a public debate among the stakeholders on the merits and risks involved in allowing larger and heavier freight vehicles on cross border transport relations in Europe.

This report aims at facilitating an objective public debate by putting the arguments of all stakeholders into perspective and by assessing the validity of the arguments and the underlying facts, assumptions and forecasts. Over the past years the public debate has been clouded by a wide range of arguments for and against the introduction of longer and/or heavier road freight vehicles on European roads. Many of which are not necessarily supported by the academic and business community.

This report will start with a general description of the "challenges ahead" that European society faces. This section presents an analysis of the freight transport demand forecasts, the high level political ambitions such as reducing traffic

accidents, reducing CO_2 emissions and reducing fossil fuel dependency, and the preferred instruments that can be implemented to reach these targets.

In Chapter 3 "Flexible Transport Systems: Necessary" the developments in transport systems now and in the future are presented in order to show what options are available to meet and overcome the challenges ahead. The crucial drivers in the choice for a transport modality such as price elasticity, economies of scale and logistical requirements are described.

The chapter concerning "25.25 will contribute to more flexibility" begins with a description of Directive 96/53/EC which determines amongst other things, the weight and length limits of heavy vehicles in cross border transport in the European Union and the suggested European Modular System in all its possible vehicle configurations. The main technical and safety aspects are put into perspective. The chapter ends with some Good Practice examples that show how 25.25 can contribute to a flexible and sustainable European transport system that will help to achieve the challenges ahead.

The final chapter provides the conclusions of the analysis of the challenges ahead, the policy options and instruments. In conclusion it provides an assessment of the arguments for and against allowing longer and heavier vehicles on European roads.

2 The Challenges Ahead

The European Union is confronted with enormous challenges in the transport sector. Economic development is expected to increase the transport demand by over 50% between 2000 and 2020. Despite the financial crisis that has put back the transport volumes in 2009 to the level of several years back, experts agree that this forecast volume will be reached again by 2014[1]. This means that there is still an imperative to take the necessary actions to reduce the adverse societal effects of transport (such as congestion, emissions, road accidents, etc) and to help to achieve high level objectives like reducing CO_2 emissions and fossil fuel dependency.

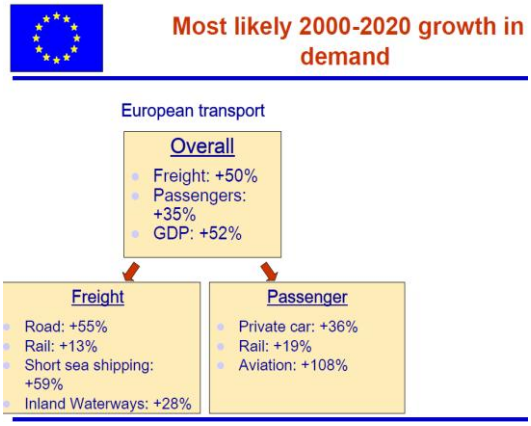
2.1 Transport Demand Expected to Increase by More than 50%

Freight transport is a complex system that depends on multiple factors. Globalization and urbanization are two main driving factors influencing transport growth. Underlying economic principles like economies of scale, lead to a concentration of production locations, but also differences over the world in the cost of productive assets, such as labour and location costs are related to a growing distance between the point of production and consumption. Thus transport has become an essential component of the European and Global economy. The transport industry at large accounts for about 7% of GDP and for over 5% of total employment in the EU.

According to the EU White Paper "European Transport Policy for 2010: Time to Decide", there is a continually increasing demand for transports within Europe. Besides freight transport passenger transport will also grow, although at a lower rate than freight. However both passenger and freight use the same infrastructure in the case of road and rail transport, so the ***existing capacity must be used efficiently***. Road freight currently accounts for approximately 45% of total transport (tonnes-km)[2] within the EU.

[1] Korte termijn voorspelling NEA, 2009
[2] EU Energy & transport in figures

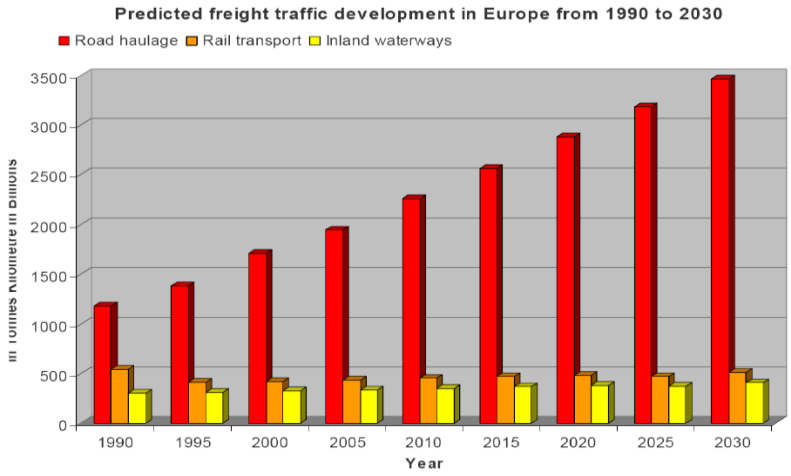
Figure 2.1 European transport growth 2000-2020



Source: European Commission

Based on a midterm review of the White Paper, the amount of transported goods is expected to increase by 50% from year 2000 – 2020. Although the crisis has slowed down the growth by approximately five years, the tendency stays the same: A major growth of transport will come and cause major challenges in the coming decades.

Figure 2.2 Forecasts



Source: European Commission

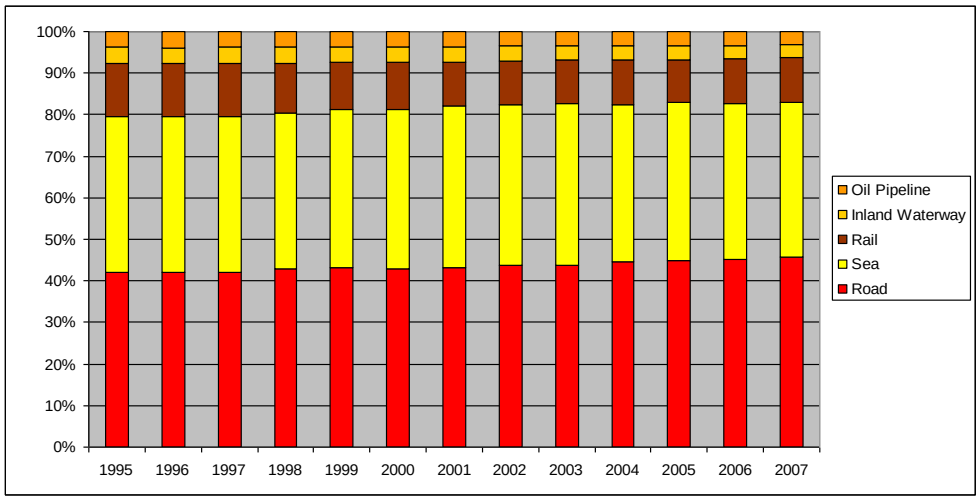
Although it goes without saying that transport has to improve with regard to the effect it has on the environment. It is also a fact that the reduction of costs and emissions in other sectors can only be made at the expense of higher emissions from transport. An example hereof is the cultivation of roses, of which the total mutual carbon footprint of cultivation in Africa and the extra effects of transports between Africa and Europe prove to be better than cultivation in Northern Europe with just a little transport.

Due to the impending growth of transport and its consequences there is a ***need for innovation*** in transport. The competitiveness of the EU economy and the resilience of the transport firms depends on the capacity to adapt to innovation and new market needs.

All Modes are Needed

A better exploitation of the network's capacity and of the relative strengths of each mode could contribute significantly toward reducing congestion, emissions, pollution and accidents. The optimal functioning of the transport system requires the full integration and interoperability of the individual parts of the network, as well as an interconnection between different modal networks. However, up till now there has been limited progress, even in the countries already equipped with LHVs, in shifting road transport to other modes (see Figure 2.2).

Figure 2.3 Market share (%) per mode in EU 27 measured in tonkilometres within the EU27 territory



Source: Energy and transport figures, 2009

Road Transport will Remain Dominant

The above Figures (2.1 and 2.2) make it clear that the EU depends on road transport, and will do so also in the years to come. Even if, in the quite unrealistic view that, rail and inland waterway transport could double their capacity, still an increase of almost 40% for road transport appears to be inevitable.

Getting traffic off the road and onto rail, inland waterways or short-sea shipping is just one way of reducing the environmental impacts of road transport. Road transport will remain an important way of transporting freight, thus ways need to be found to make it greener and more efficient. Ongoing initiatives to deploy new vehicle technologies, improve infrastructure, improve fuel efficiency and promote "eco-driving" are important steps in the good direction.

In road transport longer and heavier vehicles are a chance to face some of the challenges that lay ahead. The reduction of the number of trips, due to the introduction of 25.25, will lead to less accidents and better results for the

environment. The following paragraphs will illustrate the importance of the introduction of 25.25 in international freight transport.

2.2 25.25 Contributes to Main Policy Objectives

The 2006 Mid-Term Review of the Transport White Paper "Keep Europe Moving" concluded that the EU needs to establish a new framework. This framework must encourage improvements in the field of individual modes of transport as well as their combined actions in multi-modal transport chains for a sustainable transport system. Better utilization of the existing transport infrastructure and a reduction of the negative environmental and social effects are the main objectives of such a policy.

The European Commission will publish a new white paper on the priorities for transport policy for the next 10 years (2010-2020). The effect of introducing 25.25 is positive for three of the five DG TREN objectives. Namely, 25.25's will contribute to safer road transport, less congestion and have a positive effect on the environment.

Main objectives of DG TREN:

- With still over 39,000 deaths in the EU in 2008, transport by road remains far too costly in terms of **human lives**.
- The **environment** remains the main policy area where further improvements are necessary. In the EU, compared with 1990 levels, in no other sector has the growth rate of greenhouse gas (GHG) emissions been as high as in transport. The EU has recently adopted a climate and energy package that sets a target of reducing GHG emissions in the EU by 20% with respect to 1990.
- **Decoupling** of freight transport growth from GDP growth is prevented by a strong increase in global trade and the deepening integration of the enlarged EU.
- Transport did not significantly reduce its GHG intensity by switching to **cleaner energy sources** and is still 97% dependent on fossil fuels.
- **Congestion** that is prevalent in agglomerations and in their access routes is the source of large costs in terms of delays and higher fuel consumption.

3 Flexible Transport Systems: Necessary

3.1 Introduction

Optimizing the Functioning of Each Mode
Understanding the impending growth of transport in Europe over the coming decades it is clear that all transport modes will be needed to their full extent.
After many years of modal shift policies, political and business leaders have come to the conclusion that promoting particular transport sectors over road transport will be an insufficient measure when facing the enormous challenges ahead and could possibly even be counterproductive. Instead, the conclusion from previous studies and discussions is that all efforts have to be steered towards the development of a European transport system that functions as a co-modal system, which optimizes the functioning of each individual mode and the connections of road to rail, inland waterway, maritime and air transport systems.

Scale Enlargement a Practical Efficiency Improvement
The instrument to improving efficiencies in transport over the past decades has been to use larger ships, longer trains and larger trucks. In the maritime, inland waterway and rail transport sectors operators have been able to expand until technical restrictions limited this growth. The road transport sector has however not reached its technical limits yet, here the opportunity to grow further in the field of European cross border transport has been discouraged by Directive 96/53/EC.

The 25.25 is an innovation that can contribute to a more efficient transport system which is beneficial to the entire European transport system.

Competition Between Modes is Limited
This chapter will demonstrate why road transport is the dominant surface transport mode in Europe and why this position is not likely to change on a massive scale. The choice for a transport mode depends only partly on the comparative price level. Apart from the availability of intermodal terminals, logistical service requirements determine the mode of choice. These include lead time, consignment size, frequency of service, etc.

In-depth statistics and market analyses show that besides markets where transport modes compete, there are markets which are strictly related to one mode, an important one being that some goods require a higher payload and others simply more space. An illustrative example is the express market where volume and time problems dominate the logistic solutions. Furthermore, it concerns a market with a very intricate structure where road transport is the only suitable solution. The express market is just one example; there are in fact more submarkets that are entirely in the hands of road transport.

25.25 Strengthens Intermodal Transport
This report claims that optimizing road transport by allowing 25.25 should not be blocked to protect other modes because real competition takes place only in a limited part of the transport market. On the contrary, 25.25s should be embraced by the rail and inland waterway sector to strengthen intermodal transport chains.

3.2 Scale Enlargement is Common in Each Mode

Road Transport Must Catch Up

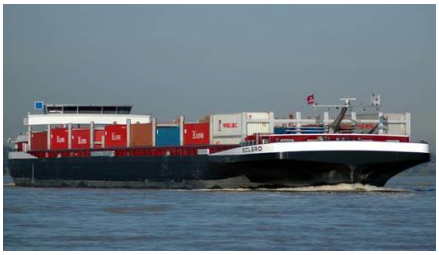
In rail, short sea and deep-sea transport, economies of scale are achieved by using higher capacity vessels and longer trains. Economies of scale in deep-sea shipping can be described in two ways: 1) the increased size of vessels and 2) the increasing market share of container vessels with a high loading capacity. The "Emma Maersk" is a familiar showcase of enlargement in maritime container vessels. Since the introduction of the first container vessel in the late 1950s, container vessel capacity has increased tenfold. The capacity increase, mainly driven by fierce competition in the container market, resulted in lower transport costs per unit of cargo transported.

These (continuing) increasing economies of scale mean that the demand for hinterland transport will increasingly being confronted with heavy peak periods, because containers from large vessels are transhipped in large amounts at once and must be transported to the hinterland as soon as possible due to limited port storage capacity.

Figure 3.1 Emma Maersk

Economies of scale are always achieved in hinterland transport. During the 1990s there was a trend to lengthen existing inland vessels in order to increase their cargo carrying capacity. Initially the length of IWT vessels was limited to 85 meters, but after steady increases in the late 1990s the "Jowi" had a length of 135 meters, which meant further increasing the profitability of IWT transport.

Figure 3.2 High capacity IWT container vessel

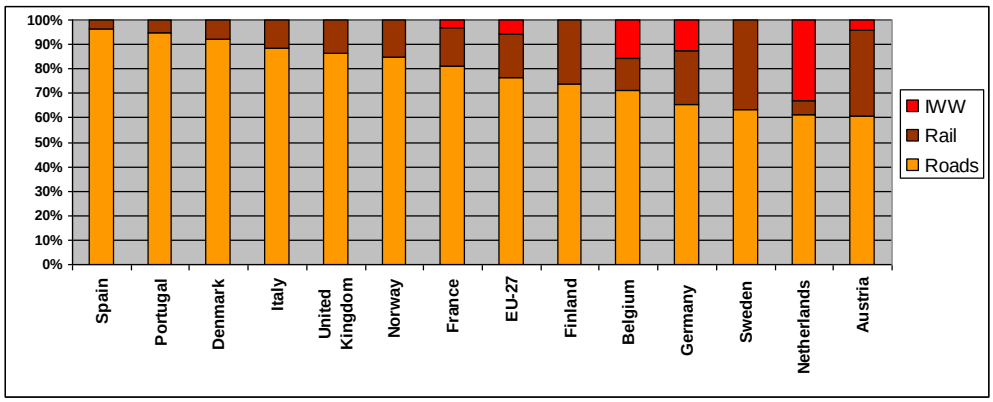


The European rail transport sector is also seeking further economies of scale by running longer trains. In 2009, DB Schenker carried out a pilot of freight trains with a length of 1,000 meters which run from Rotterdam to Oberhausen.

In Spite of 25.25, Sweden and Finland Show a High Modal Share of Rail

In cross-border European road transport the advantages of scale enlargement is discouraged by law, more specifically by Directive 96/53/EC, whilst in Sweden and Finland transport operators have been using longer and heavier vehicles without causing additional damage to the infrastructure and affecting road safety for more than twenty years. The transport statistics for these countries also show the highest relative modal share of rail in the whole of Europe.

Figure 3.3 Modal share in different countries 2007



Source: Eurostat

In various market segments 25.25 can significantly contribute to reducing congestion, fossil fuel use and exhaust gas emissions. On the main transport legs and in markets involving goods which require large volume loading capacities, large savings can be made. These vehicles should not be considered for small consignments as operating costs are higher than conventional trucks, which poses an incentive to optimise the use of these vehicles.

3.3 Competition Between the Transport Modes is Limited

Competition between the transport modes is a key issue that needs to be understood in detail before a proper assessment can be made on the impact of the introduction of the 25.25 on the share of the transport modes. Quite clearly the cost of transport is not the only driver in the decision-making process to use a specific transport mode.

3.3.1 Cargo Characteristics: Volume and Value are More Dominant than Weight

Cargo characteristics are essential factors that influence which mode of transport is typically selected and where LHVs provide the highest added value over conventional trucks. The most important factor is the value of goods, whether they are physically or economically perishable and whether they are relatively very heavy or voluminous. The analysis obviously is not necessarily true for urgent deliveries, as in those cases speed is always of the essence.

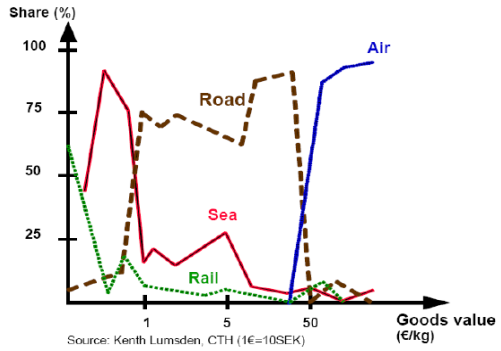
Valuable Goods and Physically or Economically Perishable Goods

The value of goods that have to be transported and the need for speed strongly influence the supply chain design and operational decisions regarding inventory, warehousing and transportation costs. Higher value goods require faster supply chains than low value goods.

In addition, physically and economically perishable goods also require faster supply chains. Physically perishable goods are, for instance, flowers and vegetables, and economically perishable goods are, for instance, consumer electronics in swiftly developing markets. These products lose value during transportation.

The effect of these cargo characteristics on modal choice is illustrated in Figure 3.4 The market share of rail transport is negligible in the high-value market, whereas sea transport is attractive for slightly higher value goods. Over a certain value road transport reigns supreme. In the highest value category air transport is almost the only alternative.

Figure 3.4 The value of goods in relation to transport modes



Source: Kenth Lumsden, Chalmers University of Technology

Heavy and Voluminous Cargo

The weight and relative volume of cargo influence mode choice and indicate the areas where LHV have the highest added value over conventional road transport. Typically rail transport is extremely efficient for very heavy and very voluminous goods. For heavy goods like coal or steel plates the high payload capacity of railway wagons and inland waterway vessels is ideal. On the other hand these transport modes are suitable for lightweight products transported for bulk buyers.

In road transport both the weight and volume capacity of the vehicles is restricted in such a way that significant efficiency increases are now impossible, but could become reality if 25.25 is allowed on European roads. These improvements are possible in several sectors for different reasons. Longer vehicles would be very beneficial in the container, temperature controlled and groupage markets, but also in the express parcel services. This would lead to longer vehicles that are only slightly heavier than what is currently allowed, or in some cases would still stay within those current limits. Heavier vehicles, on the contrary, would achieve higher efficiency in bulk markets. Container transport would benefit from the combination of longer and heavier vehicles.

In the table below the total weight of the LHVs are shown, these were measured during the 2nd half of 2008 in the Netherlands at 4 points on the road network which are, in principal, routes on which LHVs are allowed. It is interesting to note that most of the vehicles have a weight of less than 40 tonnes, leading to the conclusion that volume rather than weight is the issue at stake.

Table 3.1 The number of LHV trips and total weight of vehicle in the last half year of 2008

	Trips	Percentage
Total	13,444	100.0%
below 40 tonnes	11,329	84.3.%
between 40 and 50 tonnes	1,103	8.2%
above 50 tonnes	1,012	7.5%

Source: DVS

A similar pattern has also been noticed in the UK, the majority of trips is constrained more by volume than by weight, with the larger trucks.

For instance, for a Dutch 25.25, based on the EMS-concept and commonly used for the transport of stone wool, the loading parameter is m^3. Although in theory a loading weight of 60 tonnes (GVW) is allowed in the Netherlands, the actual load barely exceeds 40 tonnes. In fact, road transport operations in this sub-sector are strongly volume restricted.

Several other studies[1] suggest that, especially in the case of light commodities (on average weighing less than 300 kg per m^3) the actual maximum volume (in loading length and/or cubic meters) of freight vehicles is far more often the limiting factor than the total vehicle weight. However, waste and bulk transport and the transport of heavy containers (average container weight of 10 tonnes or more per TEU) form clear exceptions on this general rule.
Another important conclusion could be that especially the less heavy goods commodities are not part of the transport section on which road and rail are in competition (see also Chapter 3). The 25.25 may therefore cause only limited (reverse) modal shifts from rail towards road, estimates suggest less than 5% of the volume[2] in question.

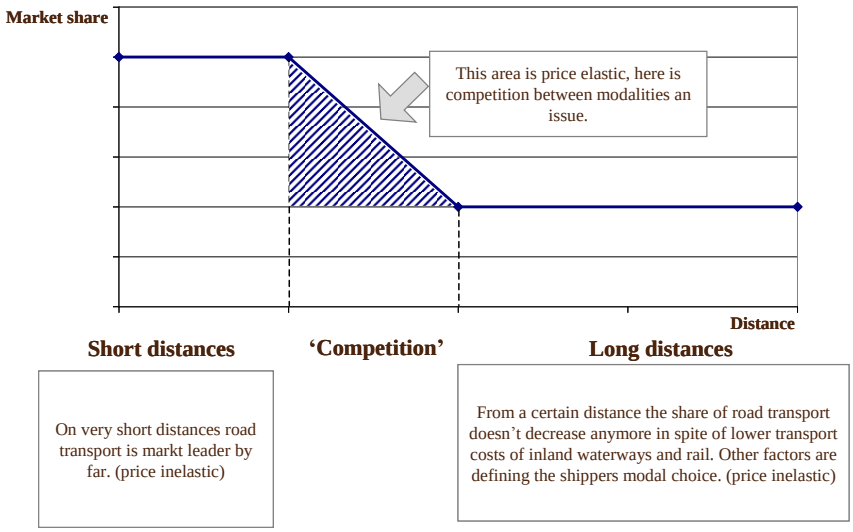
3.3.2 There is More than Transport Cost and Price Elasticity

On very short distances, road transport is without a doubt the market leader. Road transport is popular due to accessibility, small consignments, high delivery frequency, just-in-time principle and other. Over long distances the market share of road transport is lower than over short distances. But it should be noted that from a certain distance onward the share of road transport does not decrease anymore in spite of the much lower transport costs of inland waterways and rail transport. In these situations factors other than price define the choice for road transport. In these cases a lower price is not a reason for shippers to choose another modality. Between the short distances and the long distances there is potential amount of transport that is in competition (see figure 3.4).

[1] Heriot Watt University, ISL 2008 Conference
[2] Quick scan reverse modal shift effecten van langere en/of zwaardere voertuigen, 2007, Longer and Heavier Vehicles for freight transport, 2009

This is the case because 1) only part of the transport demand can potentially be accommodated by rail and IWT and 2) the transport price is not the decisive driver in the selection of a transport mode. Statistics and studies show that even on corridors where road transport is more than twice as expensive as rail, the rail sector is not the first choice. Instead, drivers in the selection process are lead-time, transit time, frequency, reliability, etc. For more and more organizations sustainability is a driver.

Figure 3.4 Competition between modalities

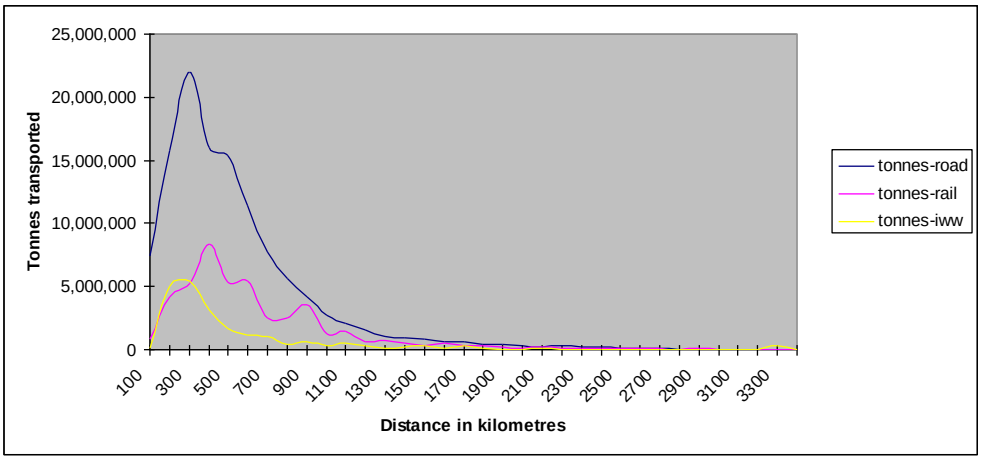


Source: PRC, 2007

In the figure below we have portrayed the distance transported within the EU27 for finished products (in which container transport is, for a large part, included). The data have been obtained from the TRANS-TOOLS[1] model and are based on the spatial characteristics of the freight flows of finished products.

[1] TRANS-TOOLS describes freight transport between 1,300 regions in Europe.

Figure 3.5 Distance transported by road, rail and inland waterways in international transport within EU27 for NSTR9 final products, year 2005



Source: NEA

The figure shows that the peak in international transport for road is between 200-400 kilometres, for rail it is between 300-500 kilometres. In this distance range the competition between rail and road emerges. Inland waterway transport plays a minor role after this distance.

When the above figures are condensed and the total volume is considered then the figures for international transport result, as shown in the table below. In the same table these are compared with domestic transport within all the EU27.

Table 3.2 The amount transported by road, rail and inland waterways in million tonnes 2005 within EU27 NSTR 9

	Tonnes Road	Tonnes Rail	Tonnes IWT	Total
Domestic	4,991	258	48	5,297
International	119	45	21	185
Total	5,110	303	69	5,482

Source: NEA

When considering the total volume of transport it can be observed that domestic transport is substantially larger. We have calculated the domestic road transport within the first range of 0-100 kilometres this amounts to 4,6 billion tonnes, which is 92% of all domestic road transport. So evidently advantages from LHV are largely obtained through domestic transport (between distribution centres) in a segment of transport between 0 and 100 kilometres. This segment is not suitable for rail at all. In this document we will, however, focus on the international segments of transport.

When the above figures or tonnes are measured in tonne-kilometres we see that a slightly different view emerges (see the table below). This leads to the rationale why important benefits can also be obtained in international transport, as measured in tonne kilometre the ratio between domestic and international is reduced. It also shows that, on average, rail is present in longer distances in international transport. On average road is more present in the shorter distances in international transport.

Table 3.3 The amount transported by road, rail and inland waterways in billion tonne-kilometres 2005 within EU27 NSTR9

	Tonne-kilometres Road	Tonne-kilometres Rail	Tonne-kilometres IWT	Total
Domestic	379.4	48.3	12.7	440.4
International	58.2	27.2	10.7	96.1
Total	437.7	75.4	23.4	536.5

Source: NEA

It should be remembered that these figures are presented per commodity group of "finished products" in which containers are present. Notably container transport is a competitive segment between all modes: road, rail and inland waterway. Rail transport has acceded in the intermodal and final products markets quite strongly in recent years. It should also be remembered that all postage and express-mail is also included in the final products segments.

Switzerland
Switzerland aims at reducing transit traffic by road and increasing freight transport by rail. The road tax LSVA plays an important role in fulfilling this goal. Since the introduction of the LSVA in 2001, the number of transit trucks has decreased. However at the same time, the weight limit of trucks has been increased from 28 to 40 tonnes which meant that the loading capacity of a single truck has increased by 43%. This increase has reduced transport costs per tonne of cargo, but also reduced the number of road trips. Hence, it is hard to determine whether the decrease of 15% of the transit traffic from 2000 to 2006 is a consequence of the road tax introduction. In addition, during the same period, rail transport — compared to the other transport modes — did not grow; the modal split of rail traffic has reduced since 2000; in this year, the market share was 69%. In 2005 this share was reduced to 65%. In 2006 the market share increased to 66%, but the main cause was the blockade caused by fallen rocks on the Gotthardroute. In the year 2007 the rail market share decreased back to 65%.

3.4 25.25 Stimulates Intermodal Transport

The choice between road freight transport and intermodal transport is very complex, because it depends on a compound function of price, the supply chain structure, cargo characteristics (as described above), freight flow balances, lead time and reliability. These factors differ for each of the different cargo types. Considering the low transport costs of rail and IWT, intermodal transport can

offer a very viable solution on many medium to long transport relations, especially where transhipment and pre- and end haulage costs can remain low. In typical intermodal chains the main transport (by rail or IWT) accounts for 80% of the transport distance, but only 33-50% of the transport costs (see figure 3.4).

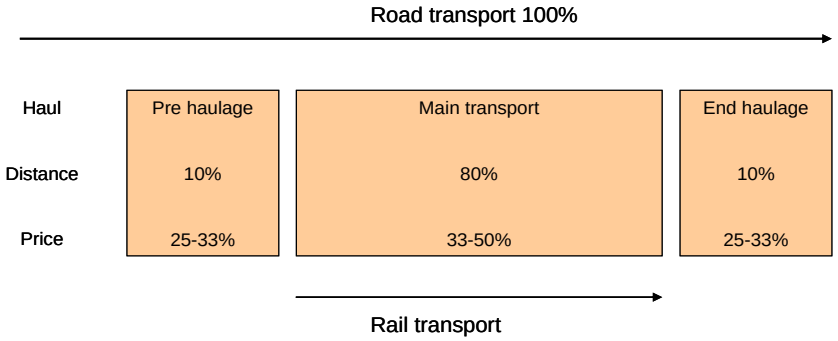
When comparing the transport demand (as described previously) with this inherent cost structure it is clear why intermodal transport has a modest position within the modal split. For instance, the share of rail transport in the EU is circa 8% based on tonnes, based on tonne-kilometre the share of rail transport is approximately 17% (Eurostat, 2009).

Germany
Within Germany, Kombiverkehr — the European market leader in the market of rail-road combined transport — transported approximately 0.023 billion tonnes of goods (about 18 billion tonne-kilometers) by rail in 2008[1]. Compared to the volumes of national road transport — 3 billion tonnes (about 253 billion tonne-kilometers)[2] — within Germany, it is clear that rail transport is still a very small part of the intermodal transport market.

The introduction of longer and heavier vehicles could present a strong stimulus for intermodal solutions. Because a LHV can transport 3TEU instead of 2TEU, fewer trucks will be needed to transport the same number of containers (assuming a sufficiently large consignment size).

In order to achieve the potential benefits of intermodal transport on a large scale, there are still significant and well-known barriers that need to be overcome, such as infrastructure capacity, integrated solutions, legal responsibility, etc.

Figure 3.7 Comparison of road and rail costs

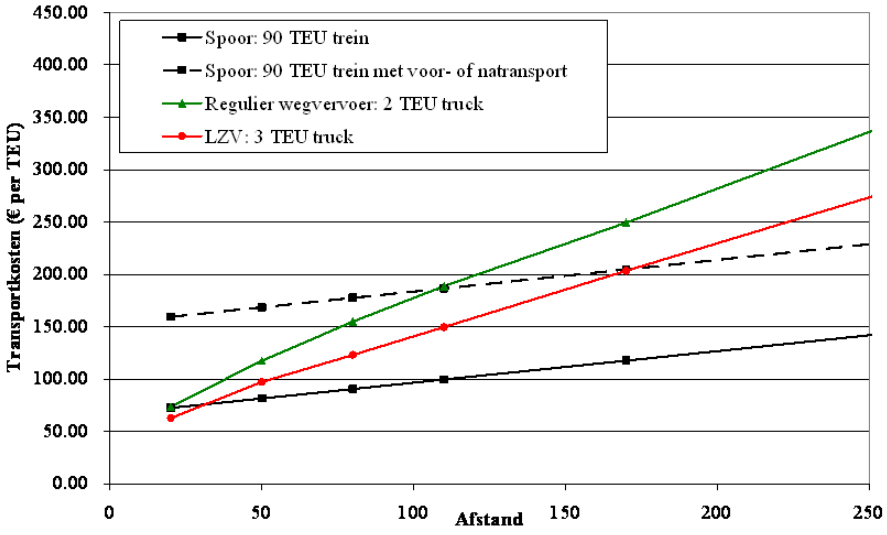


Source: Searail Consultancy

[1] Source: Kombiverkehr
[2] Source: Eurostat

From the figure below it can be observed that the competition does not take place on longer distances, after 170 kilometres the LHV 3 TEU truck becomes more expensive than rail transport with access and egress transport (in both cases less than 50 kilometres). The change from a 2 to a 3-TEU truck shifts the break even point from 110 to 170 kilometres with rail transport[1].

Figure 3.3 Break even distance for container transport



Source: PRC

Figure 3.3 shows that in container transport over short distances rail will face more competition after the introduction of 25.25. However, on the main international intermodal corridors there will be no extra competition based on price effects. So there is no reason to fear a re-modal shift. And if it doesn't occur in the most sensitive container market it will most certainly not occur in other markets.

[1] Quick scan reverse modal shift effecten van langere en/of zwaardere voertuigen, 2007, Longer and Heavier Vehicles for freight transport, 2009

4 25.25 Will Contribute to More Flexibility

Road freight transport in Europe is subject to a wide range of legislation. Weight and length dimension limits are set by the Directive 96/53/EC. Up till now research has mainly focused on 60 tonne vehicles. However, as illustrated previously, the difference will be made by length. An overview of the main technical and safety aspects will put the adverse effects into perspective and will show how they can be limited or avoided.

An important aspect is that the higher operating costs of 25.25s pose an incentive for transport operators to work even more efficiently and to reduce empty trips. This also means that longer and heavier vehicles will probably not be used by all transport operators nor on all transport relations.

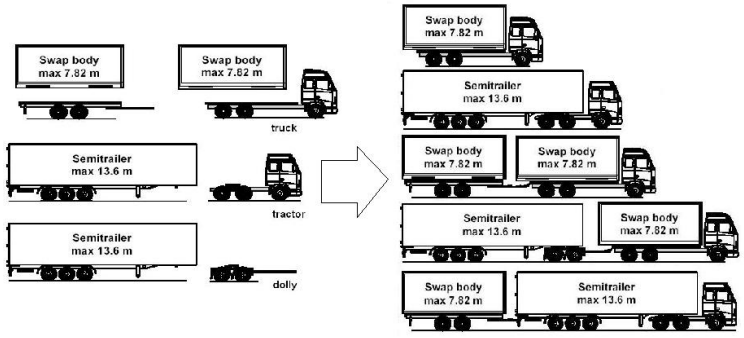
4.1 International Transport: Directive 96/53/EC

The maximum vehicle dimensions for international freight vehicles are laid down in Directive 96/53/EC. The more important hereof are: length 18,75 meters for vehicle combinations with a draw-bar construction and 16,50 meters for semi-trailer combinations, both with a maximum GVW of 40 tonnes.

The European Commission is considering the implications of allowing the use of certain larger and heavier transport vehicle concepts (LHVs) in international commercial road freight transport. However, while Directive 96/53/EC harmonizes the maximum dimensions of road vehicles across the EU and sets agreed levels for weights that would permit free circulation throughout the EU, it also allows different national rules on the maximum dimensions. Member States may deviate from the maximum limitations in national transport in certain pre-authorized circumstances, of which the LHVs based on the "modular concept" (EMS) are important examples.

The European Modular System (EMS) is a concept of allowing combinations of existing loading units (modules) into longer and sometimes heavier vehicle combinations to be used on predefined parts of the road network. Examples of these EMS-derived concepts are listed in figure 4.1.

Figure 4.1 Possible combinations with EMS



Source: TFK

In recent research[1] and debates on LHVs many vehicle configurations have already been reviewed. The following list (see also table 4.1) presents an overview of the main longer and heavier vehicle combinations and their length and (gross) vehicle weight.

Table 4.1 Some concepts of longer and heavier vehicles combinations

Type	Length (meter)	Weight (tonnes GVW)
Current concepts	18,75	40/44/50')
EMS bases concepts	25.25	40/44/46/50/60')
Non-EMS concepts	20,75/26,50	40/46/50')

') All but the first apply only to domestic freight transport within certain Member States.

Source: NEA

Sweden and Finland

Sweden and Finland have set the pace with LHV-combinations which have a length of 25.25 m and a weight of 60 tonnes. Therefore the discussion has been keen on these dimensions. Especially the increase of weight is a ponderous argument for opponents to suppress the introduction of longer and heavier vehicles on the European roads. However, as illustrated in chapter three, the increase in weight is not necessary for the majority of goods transported.

The tendency towards longer, but less heavy vehicles would be a workable outcome for the majority of good flows and would cause less disadvantages for safety, environment and infrastructure. Therefore the 25.25 EMS concept with a maximum of 46 tonnes is an outcome! The advantages of modular concepts are: no capital destruction (new concepts = reconfiguration of existing modules) and no unfair competition between operators originating from different Member States.

[1] Longer and Heavier Vehicles for freight transport, 2009

Of course there are always submarkets which do not match with standardized solutions. Car transporters for example need dimensions customized to their demands.

Current Initiatives

EMS is already a fact in Sweden, Finland and The Netherlands. Denmark started a trial at the end of 2008, running for three years and allowing foreign vehicles as well. Furthermore Germany has started field trials in two Bündeslander (Thüringen, Mecklenburg-Vorpommern). The new coalition excludes vehicle configurations of 60 tonnes but simultaneously has created an opening for discussion on longer vehicles without a (substantial) increase of the vehicle weight. Last but not least Belgium (Flanders) has serious plans to learn more about the requirements that are needed for a proper introduction of LHVs by allowing certain EMS-based vehicle concepts in field trials.

Table 4.2 National and international pilots of LHV's

	National		***International routes***
	Region of the pilot	*Period*	
Sweden	unlimited	unlimited	- Finland - Norway – Denmark - Germany (limited)
Finland	unlimited	unlimited	- Sweden - Norway – Denmark - Germany (limited)
Germany*	1. Baden-Württemberg	Sept '06 – Sept '08	
	2. Bremen	Since 2004	
	3. Hamburg	Since 2004	
	4. Niedersachsen	July '06 – July '07	
	5. Nordrhein-Westfalen	Jan '07 – June '08	
	6. Mecklenburg-Vorpommern	Sept '08 – Dec '10	- Sweden - Finland - Norway – Denmark
	7. Schleswig-Holstein	Dec '09 – Dec '10	- Sweden - Finland - Norway – Denmark
	8. Thuringen	Feb '08 – Dec '09	
	9. Germany (BigMax, Kögel)		
The Netherlands	Core-areas (country-wide)	'01 – '03 (small-scale)	
	Core-areas (country-wide)	'04 – '07(large-scale)	
	Core-areas (country-wide)	'07 – '11 (large-scale)	
Denmark		'08 – '11	- Germany (limited) - Sweden - Norway – Finland
Norway	E6/E18 Svinesund-Oslo, Riksveg 2 Swedish border-Kongsvinger, E12 Swedish border-Mo i Rana en de E8 Finish border-Skibotn	June ' 08 – '11	- Sweden – Finland
Belgium	Limited number of motorways	Not yet specified	

**Germany is working on a national trial, which might start in 2011[1].*

Source: TLN, Tweede Kamer Nederland, RDW

4.2 25.25 is an Excellent Technical and Safe Option

The 25.25 will mainly be used, and in some countries and pilots already are being used, for goods flows between distribution centers ("transport nodes"). This practice means that 25.25s will mostly be operated on the main highway

[1] Letter of German Secretary of State Andreas Scheuer, 2010

road network (the TEN-T network) and in addition only on the (underlying) roads connecting this network to the (industrial) business parks. Notwithstanding this fact, for example in the Netherlands, certain LHV vehicle concepts are being used on supply routes for city logistics. However, these freight vehicles will not enter the city centre as a full HGV for delivery. Before entering the city the HGV will be disengaged into its basic separate modules and proceed as a regular city distribution truck.

Objections and Counter Arguments

1. The 25.25 trucks will destroy the effects of 10 years of intermodal policy
   On the contrary, the modal share of rail and IWT is determined by many more decision drivers than cost. Logistical requirements such as lead time, frequency of service and traceability are much more important. In addition, the rail network is already overcrowded and can only absorb a fraction of the growing demand and IWT is naturally bound to specific regions.

2. Road safety will be affected
   Real life trials and years of operations prove that 25.25 trucks have no negative impact on road safety. There is no proof that accidents involving these vehicles have been influenced by their length or weight. Also a reduction in the total number of trucks on the road can be expected.

3. Lower transport costs will increase transport demand
   It is highly unlikely that reduced transport costs will have a significant effect on the freight transport demand because they constitute only a limited component of total logistic costs

The technical aspects address a series of very diverse impacts of operating 25.25s on a large(r) scale. These impacts are often used as reason *not* to allow 25.25s on the (national) road network. Such impacts concern:

- road safety
- emission of pollutants
- road infrastructure related impacts such as road wear and tear, parking, overhaul and other problems directly originating from the larger dimensions of the truck, etc

However 25.25 is an excellent technical and safe option, which is illustrated in the following examples.

25.25 is Safe

In the Netherlands a series of eleven traffic accidents[1] have occurred with LHVs during the past three years. The question is whether this number is disproportional in comparison with the figures on traffic accidents for "ordinary" trucks. A closer look at the accidents revealed that there does not seem to be a direct link between the additional dimensions of the LHV and the cause of the accidents. In other words, an ordinary truck would have suffered the same accident. As fewer trips are needed to perform the same transport task, LHVs will therefore result in fewer accidents.

[1] Monitoring Verkeersveiligheid Langere en Zwaardere Vrachtwagens, 2009

Individual LHVs are more bulky (in terms of total mass and/or total length) than ordinary trucks, and thus in principle less safe than regular trucks. However, due to the reduction in road vehicle-kilometres, the overall effect on road safety seems to be positive.

Braking Path
The braking path of the LHV is no worse than the braking path of the conventional truck. Because of their length, LHVs have more axles than conventional trucks. The maximum permitted axle weights for LHVs are the same as for conventional trucks and because every axle must be equipped with the minimum capacity of braking power, there is no difference in brake performance between LHVs and conventional trucks. Within the Netherlands the braking path performance of LHVs has been tested extensively by the RDW, the Dutch organization responsible for the technical condition of vehicles, the results of these tests also validate the braking path equivalence.

Drivers
Research among 1,000 car owners in the Netherlands[1] in 2009 resulted (amongst others) in the conclusion that more attention should be paid to the LHV driver: he or she should follow specific courses and must be a driver with a minimum amount of driving experience. Indeed driving LHVs results in extra responsibilities in traffic. Manoeuvring can be more difficult and because of the length of the LHV, more attention must be paid to surrounding traffic. As this was clear since the beginning of allowing LHVs, the Netherlands determined that it is compulsory for truck drivers to acquire a specific certificate to drive LHVs. The exam pays attention to controlling the truck, the accompanying paperwork, traffic participation, energy-conscious and environment-conscious driving behaviour. Furthermore, there are two additional conditions for the driver to drive LHVs:

- The driver must have at least five years of driving experience with vehicles heavier than 3,500 kg;
- The driving qualifications of the driver may not have been suspended over the past three years. Nor may the driving licence be considered invalid due to misbehaviour or criminal activity.

These two conditions result in only experienced drivers coming onto the market who will be able to react appropriately in different traffic situations. Above all, LHV drivers say that driving LHVs on regional roads is not a problem; during the training specific attention is paid to driving on these roads. A final remark is that drivers are well aware of specific potential bottlenecks, because in general they operate on fixed routes.

[1] Which is representative for the Dutch car owner.

Taking in account a transport distance of 50m, 1 kilometer road can take:

- 15 semi-trailer of 16,50m : 510 pallets
- 13 EMS of 25.25m : 689 pallets

This means:

- ⇨ 35% extra loading capacity in volume.
- ⇨ 28% less road occupancy
- ⇨ 33% less truck movements
- ⇨ 15% less emissions of NO_x, CO, PM_{10}

Source: Volvo

25.25s Will Lead to Fewer Emissions

In chapter three a clear distinction has been made between LHV-transport segments that could be in competition with other modes of transport and the part that is clearly not. For this last part the conclusion is plain and simple: LHVs cause fewer emissions.

If *some modal shifts* were to take place or some *additional transport demand* would be generated the answer is much more complex. The facts are that trucks have become much cleaner (Euro-5 and future Euro-6 engines) and much more fuel efficient (loaded performance: 1970: 50 liters/100 kilometer; 2010: 35 liters/100 kilometers) in the recent past and are still improving. For some emissions the road sector might even challenge IWT vessels and certain freight trains. It seems that the road freight sector shows much higher adoption rates of technical improvements than both the IWT and the railway-sector. A clear example hereof is the ongoing wind tunnel and practical test for further improved aerodynamic shaping.

25.25 Has No Negative Impacts on Road Wear

In some regions bridges, tunnels and parking slots may have to be adapted because of the extra dimensions of LGVs. Although these costs could be substantial, calculations have proven that these costs tend to be lower than the overall savings that are caused by LGVs in the transport sector[1], and in society (less emission and fewer casualties). Especially, if the enlargement of the truck is mainly focused on the vehicle length and less on the maximum vehicle weight,

[1] Impact LZV's op kunstwerken, Oranjewoud 2007

it is believed that the effects on the (wear and tear of) the infrastructure will be very limited.

Imaging a queue of one kilometer of trucks.

- 60 semi-trailers of 40 tonnes, with 5 axles = 60 x 40/ 60 x 5= 8 tonnes per axle
- 40 EMS of 60 tonnes, with 8 axles = 40 x 60 / 40 x 8 = 7,5 tonnes per axle
- 40 EMS of 46 tonnes, with 8 axles = 40 x 46/ 40 x 8 = 5, 75 tonnes per axle

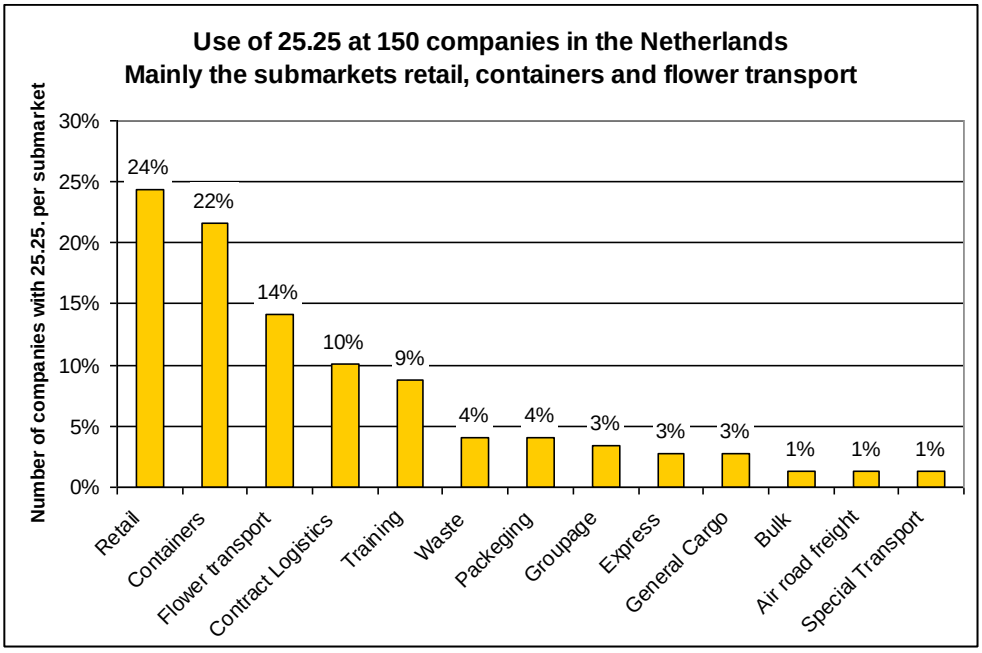
⇨ EMS with 60 tonnes has 6,7% less road wear
⇨ EMS with 46 tonnes has 39,1% less road wear

Parking places
In some countries there is a shortage of parking places for heavy goods vehicles. These parking places aren't suitable for 25.25 yet. The standard length of current vehicles is 21.95m. This is one of the items that need attention when introducing 25.25. Germany is one of those countries with a shortage of parking places. However, before the end of 2012 the parking capacity will be increased with 40%. Furthermore trials need to give a better insight into how often 25.25, which will mainly be used for depot-depot transport, will use a parking place.

4.3 Trials Show: Merely Volume Sensitive Goods

4.3.1 National Cases

Experiences in the Netherlands



Currently (March 2010) 400 LHVs are active on the Dutch roads. This figure is twice as many as a year ago. According to the Dutch Ministry of Transport, the deployment of the LHVs is mainly replacing regular road transport trucks and is not substituting transport by rail or inland waterways. However, it is important to realize that the Netherlands is a small country and domestic transport cannot be easily compared with larger European countries. Within the Netherlands, several sectors indicate that the use of LHVs really contributes toward lowering costs and reducing greenhouse gas emissions. These sectors are mainly involved in transporting voluminous goods like stone wool, consumer goods and express goods. The logistic developments, also with regard to the use of LHVs, in these sectors are gaining momentum and involve not only product innovation but also process innovation.

The Horticulture Sector Benefits from the LHV

The horticulture sector has presented evidence, through several cases, that LHVs strongly contribute to business goals like reducing transport costs and greenhouse gas emissions. Market parties indicate that the utilization rate of LHVs is approximately one-third more than conventional trucks. The logistics of the horticulture market is organized in such a way that LHVs can be used very efficiently including a substantial reduction of empty kilometres; LHVs are also used for transporting return cargo. Another important advantage in this sector is the scale level among individual customers in the supply chain. As large volumes of products have to be transported at once, the potential of LHVs increases considerably. In addition, shorter lead times result through transporting more volume in one trip improves the service level in the supply chain. In the Netherlands, flower auction FloraHolland and some large transport firms foresee strong advantages for export firms and traders which are not actually located at the auction area themselves. One of the transport firms that owns LHVs is flower transport firm Jack te Baerts (located in Eelde and Horst a/d Maas).

This firm is very satisfied, "the only bottleneck is the LHV prohibition in both Germany and Belgium" he explains. Horst a/d Maas is located close to the German border and this means a "no-go" in Eastern direction for their LHVs. Also other market parties indicate that they will invest further in LHVs if Germany and/or Belgium allow LHVs. At this moment over 90% of the market of agricultural products, which are mainly perishables, is transported by road, for reasons of flexibility and lead time. In other words, for agricultural logistics LHVs would mainly lead to a further optimization of road transport, while practically no modal competition is at stake.

Supplying Supermarkets

Currently, city centres suffer from large trucks which are often not fully loaded and which are not always equipped with the most advanced and environmentally friendly engines. The result is overcrowded or somewhat blocked city centres, resulting in more congestion, and more CO_2 emissions, stench and noise. To fight these problems, the use of LHVs is one of the most recent developments of transport firms supplying large supermarkets. Also this submarket is an example of mainly volume sensitive goods. In the distribution, the full capacity of the LHV is used on the main routes, while just before the city limits are reached, the LHV is decoupled into its smaller units. In the Nijmegen area in the Netherlands, twelve shops of the Albert Heijn supermarket chain are currently supplied with a

similar concept. The new LHV of the transport firm Cornelissen, a subcontractor of Albert Heijn, consists of a truck with a "normal" and a smaller trailer. In the city of Nijmegen, trucks fuelled by natural gas, take over the trailers from the LHV. The big advantage of this solution is the very smooth decoupling process which otherwise could block the use of LHVs in this kind of transport assignments. Besides Albert Heijn, also other supermarkets like Dirk van den Broek, Jumbo and Plus are using LHVs more and more. This development results in the fact that currently a major share of this market segment is actively involved in developing efficient and environmentally friendly logistical distribution concepts with an important role for LHVs. Some transport companies in this market indicate that total maintenance costs are lower than those of ordinary trucks.

Win-Win Situation
Applying LHVs encourage firms to find return cargo, in order to reduce empty kilometres as much as possible. Besides empty boxes and cases, the remaining cargo space is filled by (return) cargo of third parties which are located along the route. This return cargo possibility benefits third parties as well, because they save transport costs; a typical win-win situation. In fact it means that LHVs may have to take a detour of just a few kilometres to pick-up return cargo and hence reduce partly loaded driving.

The Express Market
Although at the origin and final destination of a certain transport assignment the volume could be very small, just a package or a box, transport firms in the express market have to move large volumes of goods between their main distribution centres. These companies see more and more the benefits of using LHVs with maximum loading capacity measured in cubic meters; with respect to the transported commodities: the (maximum) permitted vehicle weight is nearly never a bottleneck even at 40 tonnes.
Mr Viegers, managing director operations of DHL Express Benelux states: "The loading capacity of two LHVs is equal to the capacity of three standard trailers". Besides direct cost advantages, there are more efficiency advantages. For instance, the driver can park his second unit at the customer's site, after which this customer can load or unload the cargo. Meanwhile, the driver runs the truck with the front loading part to another destination and returns later on to pick-up the trailer. In this way, also an important reduction of transport kilometres can be achieved. This environmentally friendly solution fits well in DHL's worldwide GoGreen-programme. Through this environment programme, DHL has committed itself to reducing CO_2 emission per shipment with 30% by 2020 compared to 2007.

Other Sectors
Finally, also in other sectors LHVs are part of the truck fleets. Several Dutch firms in the field of waste processing and transportation are successfully using LHVs for the transportation of (household) waste between transhipment stations on the one hand, and intermodal terminals and energy producing stations on the other. In the Dutch (deep-sea) container market, transport firms also use LHVs; instead of two 20 foot containers, three of these containers can be carried (an increase of 50%). However, as the weight range per container runs from about 5 tonnes (empty) to more than 30 tonnes, in some subsectors weight limitations could limit the LHV advantages. Notwithstanding the obvious advantages of LHVs

in container transport, some of these transport firms will not invest in LHVs anymore until these trucks are also allowed into neighbouring countries.

Experiences in Germany

Hellmann Worldwide Logistics
Since November 2006 Hellmann Worldwide Logistics has been participating in the field tests of Niedersachsen with a 25.25 meter long freight vehicle. More than 110.000 kilometres were navigated without any accident. Fuel consumption and driving behaviour are comparable with the classical freight vehicles. The advantage is in the higher loading space of 158 cubic meters in comparison to 90 – 100 cubic meters. Hellmann logistics saved 18,000 litres of fuel from the moment of starting the field tests. Instead of three vehicles they can use, in the future, two vehicles with the same load units. Hellmann makes use of the LHV concept, but uses rail as well. In order to handle the future increasing volumes there are new logistical concepts needed which incorporate all modalities. The biggest problem is actually the missing lines for freight flows. The LHV is just one aspect to finding a solution for of the whole problematic of increasing freight flows. Since 2004 the Hellman Worldwide Logistics has been transporting freight in cooperation with Stinnes. Daily freight is transported by rail between Hamburg, Bremen, Hannover and in the Osnabruck direction Frankfurt and Nurnberg and back. "We would like to expand the rail transportation of our goods, but it is not possible to get additional lines for our freight transportation" says Klaus Hellmann. Decisive for the LHV concept for Hellmann is volume, not the allowed gross vehicle weight, 48 tonnes is enough. With two additional axles and thus a shorter braking distance, traffic safety with these LHVs will remain at least at the same level as well as the expected road wear and tear. "Our test results show no additional security risks and the LHV is more ecological. It can help to release the road transport; rail cannot absorb these volumes", says Klaus Hellmann.

Rigterink Logistic Group
Rigterink Logistic Group uses a LHV from Bernard Krone and Mercedes-Benz. The truck is 25.25 meters long and has a loading volume of 150 cubic meters. Within the submarket in which the Rigterink Group operates, the gross vehicle weight of 40 tonnes is no bottleneck and therefore will not be exceeded. Given a certain transport performance, less truck trips means a reduction in fuel consumption. In this case the use of LHVs, instead of ordinary trucks, will lead to an average decrease in fuel consumption of about 30% for each transported cubic meter of cargo. This means a proportional benefit for the environment, with regard to CO_2 emissions and with regard to noise. Additional axles will distribute the vehicle weight on streets, bridges, and tunnels. In fact the actual reduction of the axle loads will preserve the streets more than conventional vehicles. Due to the use of new security systems the vehicle safety has also been improved. In fact there is no real alternative for LHVs. The vehicle concept is economically and ecologically viable. The concept is also complementary to rail and IWT in the perspective of managing the increasing number of freight flows.

Denmark Trials

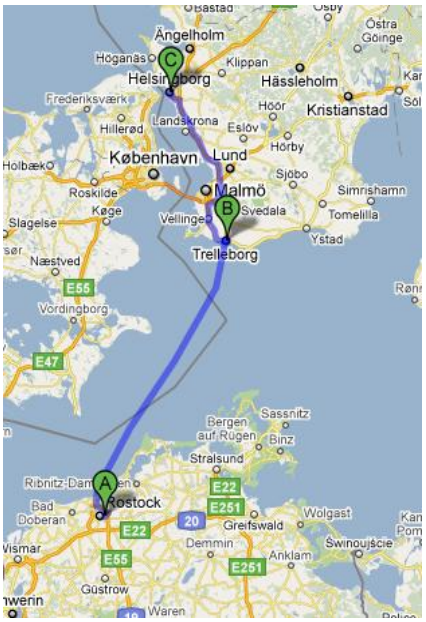
Denmark is the most recent country to start to test 60-tonne 25.25 metre trucks on its roads. Since 24 November 2008, LHVs are allowed on specified main roads, which together connect eighteen Danish ports, for a three-year trial period. This allowance creates possibilities to drive LHVs between Germany and Sweden. Also foreign LHVs are allowed into Denmark, as long as these are approved and legal in the origin country. Vice versa, the allowance of foreign LHVs in Germany is also under development. For the first time, a Danish LHV passed the Danish-German border in December 2009. This LHV was loaded with fresh flowers with as its destination a small village near the city of Hamburg.

4.3.2 International Cases

Homtrans

Since the end of 2008, the German road transport firm Homtrans has been involved in an international LHV pilot between Sweden and Germany. LHVs are used in freight transport between the German state of Mecklenburg-Vorpommern (city of Rostock) and Sweden (i.e. Helsingborg). Figure 4.2 shows the route on which the LHVs are active. In the port of Rostock, the LHVs drive onto the ferry which ships the trucks to the Swedish port of Trelleborg; from this port, the LHVs drive to Swedish cities like Helsingborg and Norrköping. Until now, the pilot has been prolonged twice and will — at this moment — run until the end of 2010. The management of Homtrans says that they want to extend the traffic from Germany to Sweden in order to benefit from the additional loading space of the LHV. One trip each week with a LHV amounts to a savings of twenty six trips with a conventional truck on an annual basis. Homtrans calculated that this will save an estimated fuel consumption of more than 4,000 litres.

Figure 4.2 LHV use of Homtrans between Germany and Sweden



Source: Google, 2009

Alex Andersen

Since the end of 2009, the road transport firm Alex Andersen has been involved in an international LHV pilot between Denmark and Germany. The first trip was in December 2009 during which the LHV was loaded with flowers with a destination near Hamburg (state Schleswig-Holstein). Flowers are characterized by their voluminous nature and that is why the weight limit during the pilot (40 ton) was not a problem, while the length of 25 meters is very important to realize the scale advantages. The pilot is running from December 2009 until December 2010 and the license for LHV transport over that specific corridor is even valid for three years. Earlier experience of Alex Andersen within Sweden and Denmark already proved that savings of 26% of fuel consumption and 33% of kilometres travelled were realised by the use of two LHVs (instead of three conventional trucks). This international pilot is a nice start, but will become a serious trial when trips between Denmark and the Netherlands are feasible.

Helsinborg – Lulea, 50 trips at 3,000 km per truck per year

2 modular 25.25	3 regular trucks	Conclusion
300,000 km	450.000 km	-33%
2.7 km/l	3.0 km/l	
111,000 liters of diesel	150,000 liters of diesel	-26%
293 ton CO_2 emission	396 ton CO_2 emission	-26%

Odense – Arhus, 250 trips at 300 km per truck per year

6 modular 25.25	9 regular trucks	Conclusion
450,000 km	675,000 km	-25,9%
2.7 km/l	3.0 km/l	
167,000 liters of diesel	225,000 liters of diesel	-25,7%
441 ton CO_2 emission	594 ton CO_2 emission	-25,7%

5 Time to Decide: Let's Gain Experience through International Trials

Directive 96/53/EC regulates the weights and dimensions of heavy commercial vehicles within the territory of the European Union. Now thirteen years old, the directive may have reached its limitations, and risks becoming a barrier in road freight optimisation.

The current regulation permits trucks of maximum 16.5 m (1 point of articulation) or 18.75m (1 or 2 points) in length, 40 tonnes in weight and 4m in height to circulate across European borders. For intermodal traffic, 44 tonnes is the maximum.

Many studies that have been carried out todate have been calculating with 25.25 metres length in combination with 60 tonnes in weight. However, effects on the wear and tear of infrastructure will be very limited if the enlargement of the truck is mainly focussed on the vehicle length and less on the maximum vehicle weight. A concept based on 25.25 metres in combination with 44/46 tonnes is a serious option.

Above all, the limited weight of the 25.25 will overcome a drawback on modal shift effects. Besides this the safety aspect of the 25.25 is not affected by the fact that trucks are longer, but a reverse effect is more likely; because fewer trips are needed to perform the same transport task, 25.25 will result in fewer accidents.

Fear that negative modal shift effects will be caused by allowing cross-border transport with 25.25 trucks is not appropriate. As indicated, the competition between road transport and intermodal transport is limited for most goods. On short distances, road transport has no significant competition from rail and inland waterway transport, because of its' strong features regarding accessibility, flexibility and transit times. Also on long distances, in many cases the choice for road transport is based on factors other than price. Hence, in these situations, road transport has very limited competition from intermodal transport.

Decoupling of freight transport growth from GDP growth is prevented by a strong increase in global trade and the deepening integration of the enlarged EU. The use of the 25.25 cannot solve this issue, because international trade is driven by factors other than transport costs alone. Road transport is and will remain essential to accommodate growing freight transport flows within the EU. The rhetorical shift from "intermodality" to "co-modality", which to most people must seem indistinguishable, conveys an

understanding of the fact that improvements in the rail and inland waterway sector cannot solve future problems alone. Only part of the transport demand can potentially be accommodated by rail and inland waterway transport. On top of that, even if rail and inland waterway could double their capacity, there still will be a substantial growth of road transport. With these developments in mind, innovation in the road transport sector must be encouraged to create capacity in road transport and reduce greenhouse gas emissions.

The trials in the Netherlands show that through close monitoring the objectives of different stakeholders can be met. In this way all stakeholders are inspired with confidence that 25.25 will add value for all stakeholders. Above this, the confidence created by the trials has already resulted in innovations for 25.25.

Similar to the learning process in the Netherlands, an international pilot would contribute to the discussion in Europe on 25.25. Allowing trials with 25.25 trucks in the express market would constitute a very low risk experiment: there is virtually no competition from other modes in this market and the vehicles will not be heavier than conventional trucks. The express market is willing to invest in more sustainable road transport, is Europe willing too?