

EXPERIENCES LHV'S IN THE NETHERLANDS: TYPICAL DUTCH OR VALID FOR EUROPE?

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Abstract

The gained knowledge and experiences with LHV's in The Netherlands are sometimes considered as too specific and therefore not valid for other European countries. A reverse modal shift in domestic transport is not happening because of the short distances and the minimal share of the rail sector in domestic transport. Quite different will be the situation in Germany and the Alp countries where the rail sector has a larger share in domestic as well as international transport. There a reverse modal shift will happen, as road transport will be cheaper due to the LHV's. Also the traffic situation is different in The Netherlands. Results from LHV safety studies cannot automatically be applied to other countries because of the differences in spatial planning and road design characteristics. Are the LHV experiences in The Netherlands indeed typical Dutch or valid for Europe? That is the question this paper deals with.

Keywords: Heavy Vehicles, Modal shift, Logistics

1. Introduction

The Netherlands started with LHV-trials in 2001. In this period the government still had an active incentive policy to encourage a modal shift from road to inland shipping, short sea shipping and rail. The political environment was hardly ready for talking about road transport efficiency. The road freight sector however was looking for ways to enhance productivity and pitched for a trial. The Ministry of Infrastructure and Environment wanted a cautious start of the first trial. Only four companies participated. In spite of the few participants, a significant reduction of fuel consumption was measured and consequently a reduction of CO² emissions. A second trial period (2004 – 2006) was set up and after positive findings, a third trial period, the so called Experience Phase (2007 till now) was marked.

Every trial period was monitored extensively. The most important areas of attention were traffic safety and the possible impact on the modal split. If a reverse modal shift would take place, all benefits from the allowance of LHV's (reduction of fuel consumption and CO² emissions, and less traffic intensity) would vanish. In June 2011 the Minister of Infrastructure and Environment, Mrs. Schultz Van Hagen, announced a termination of the trial period and a permanent regulation providing LHV-exemptions as of January 1st of 2013. The LHV is not incorporated in the law as a new commercial vehicle type. The national as well as the international situation is still in a state of flux and an exemption system makes it possible to anticipate quickly.

The gained knowledge and experiences with LHV's in The Netherlands are sometimes considered as too "country-specific" and therefore not valid for other European countries. A reverse modal shift in domestic transport is not happening because of the relatively short distances and the minimal share of the rail sector. Hence, the Dutch results will not work in Germany and the Alp countries, where the rail sector has a larger share in domestic as well as international transport. There a reverse modal shift will happen, as road transport will be cheaper due to the LHV's. Also the spatial planning and road design characteristics are different in The Netherlands. Results from LHV safety studies therefore cannot automatically be applied to other countries. Are the LHV experiences in The Netherlands indeed typical Dutch or are they valid for Europe? That is the question this paper deals with.

Admission policy in The Netherlands

Before dealing with the questions stated above, this paragraph gives a short description of the way LHV's are admitted in The Netherlands. A company can apply for an exemption at the National Road traffic Department (RDW). The RDW is the central window where applicants for LHV exemptions can receive both the approval for the LHV equipment as for the desired routes. In close co-operation with all the road administrations in the Netherlands, a comprehensive route network is established. An exemption is connected to the license number of the tractor. If a route in this network is released, every company with an exemption can use this route. A digital map is available and serves both as an easy reference and as a part of the formal exemption. Not on this map are a limited number of specific and individual access

routes, only released for one company to be able to get to the LHV-network. These routes are not appropriate for the use by many LHV's but were considered suitable enough for limited use. Conditions attached to the exemptions are extra vehicle demands, requirements to the qualification of the LHV-driver, restrictions to the load and the weather conditions. The number of companies that can apply for an exemption and the number of exemptions per company are not limited. Also foreign companies can apply for exemptions. Foreign drivers have to take the same exam as their Dutch colleagues. If necessary the exams can be taken in the presence of a certified interpreter who is paid by the transport company.

Reading guide

In the second chapter an overview is given of the way LHV's are used in the logistic process in The Netherlands. The focus here is on the transport efficiency. The third and fourth chapter are concentrating on the monitoring results of the impact of LHV's on the modal split and on traffic safety. The question is raised if these results can be translated to an Europe-wide context. The fifth chapter shows the expectations of cross border LHV transport from a Dutch perspective. The final chapter gives conclusions.

2. The use of LHV's in The Netherlands

The Netherlands is a small nation located in the delta area of three large European rivers: the Schelde, the river Rhine and the Maas. Because of this geographical position important port areas could develop. The Port of Rotterdam is the largest of Europe and one of the largest in the world. The distances in The Netherlands from north to south and from west to east is in a straight line respectively 280 km and 160 km. Almost 17 million people are living in the country with a population density of 400 per km².

Since the nineties congestion is getting more worse. Till 2010 the congestion increased yearly from 1990 onwards with 6,3%. Due to substantial investment in the infrastructure, congestion decreased with 24% in 2011. But a shortage of road capacity during peak hours is expected in the long term, especially in the Randstad, the mid-western part of The Netherlands, formed by the largest four cities of The Netherlands and all the more suburban areas in between. The accessibility of the economic centers and urban areas are at stake, but also the competitive force of the sea ports. Especially the Port of Rotterdam is important for the Dutch economy, being very dependent on international trade. The Port of Rotterdam is 10.500 ha, extends over 40 km and has a yearly turnover of 430 million Tonnes of goods. In 2013 the Tweede Maasvlakte is finished, an expansion of the port area with 1000 ha pushing further into the sea. This area is meant for deep sea related container transshipment, distribution and chemicals. Apart from an increasing number of transshipment freight by short sea shipping, a large part of the flow of goods from and to the port has to be realized in the hinterland one way or the other. This forms one of the important motivations for the Ministry of Infrastructure and the Environment to encourage all modalities to excel in more efficiency and productivity. This is actively supported by the building of the only dedicated freight rail line in Europe from sea to German border, an active support in infrastructure and services for inland shipping and the use of LHV's in our country.

Did the admission of LHV's indeed meet the expectations of more efficient road transport? To answer this question, in 2011, the Dutch consultancy NEA was commissioned to research the way LHV's are being used in daily logistics. In total 118 LHV companies were closely involved in this research.

Numbers

Since the first admission in 2001, the number of LHV's has increased to 649 in the first half of 2012. The growth of the number of LHV-companies is not as fast as the increase of the LHV approved vehicles. This means that mainly companies that already have LHV's, expand their LHV-fleet. In 2010 there were approximately 200 LHV-companies: mid-2012 that number slightly increased to 213. The share of LHV's in domestic transport is less than 1%. Most of the companies have one or two LHV's. Some companies, mostly active in the retail segment, have more than 10 LHV's. The transport company Wematrans for instance, specialized in the transport of flowers, made his complete fleet fit for use as an LHV-combination.

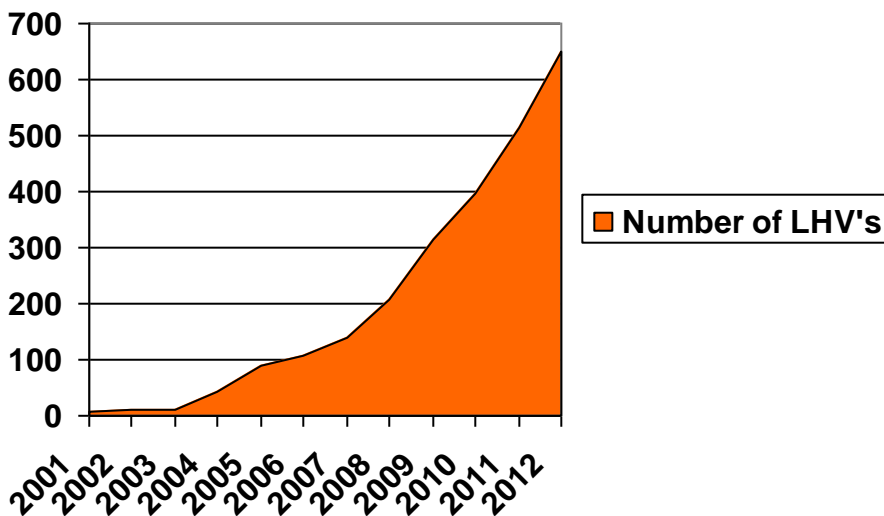


Figure 1 – Number of LHV's in The Netherlands 2001 – 2012

In a monitoring research of 2006, depending of the scenario choosen, a growth of the number of LHV's was predicted between 6,000 to 12,000 vehicles in the long term. That seems to be too optimistic, looking at the current growth of the number of LHV's.

Companies can apply for LHV-exemptions for core areas. These core areas are industrial areas, auctions, ports or terminals. Road administrations can allow LHV's on the whole core area, just a part of it or even just one street or house number. It depends on the judgement of the safety situation. From the beginning, there have been applications with the RDW for 690 core areas. 474 core areas were approved (69%), 160 core areas were refused (23%), and 56 core areas are at the moment still under consideration (8%).

Market segments

The enthusiastic welcome of the LHV-concept by the retail sector was unexpected. Less surprising was the adoption of the concept for the transport of flowers, containers and waste. The transport company Dusseldorp specializes in the transport of waste and was one of the first companies that drove LHV's. Other market segments are: Parcels and post, Building materials, Packaging, Contract logistics, Air freight and liquid bulk and silo. For shippers and transport companies, the concept of LHV's is often part of a company policy for a green image or an image for social responsible entrepreneurship.

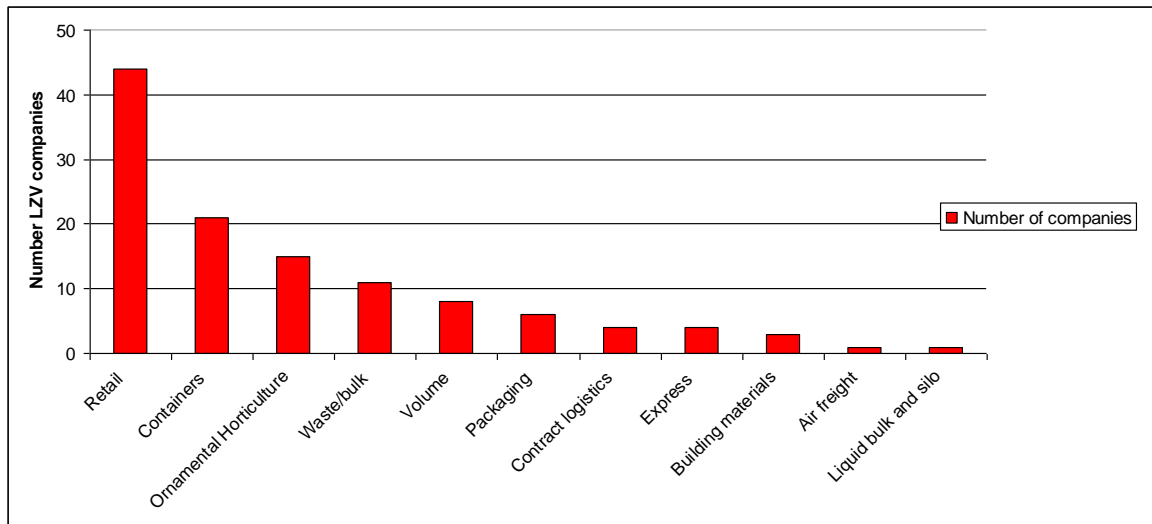


Figure 2 – 2011 LHV companies by market segment (LHV Survey, 118 companies)

All large supermarket organisations and chainstores in The Netherlands use LHV's. Typically LHV's are used in shuttle services on fixed routes between two distribution centres (point-to-point transport). But suppliers also use LHV's to bring the goods to the DC's. And since a few years LHV's are being used for supplying the stores in the urban areas. In this case specific city trailers with steering axles are being brought to the edge of the town, where the vehicle is decoupled and driven into town as a regular tractor with city-trailer. The location of supermarkets in the centres of towns and residential areas is typical for The Netherlands, as in other European countries supermarkets and malls are often located at the edge of the built area. Return load of LHV's is often a combination of retail products (returned articles or other kinds of consumer articles) and waste and packaging materials. Some companies have to make adjustments in their logistics to be able to receive the volume of goods from an LHV at once and sometimes more room for manoeuvre has to be created on the site of the distribution centre. It is noted to be a problem.

Type of configuration

Because of, among other reasons, the economic recession it is harder to forecast the demand for transport. Flexibility of the vehicle fleet gives the possibility to react adequately on the fluctuation in the market. Besides minimal investment costs, the easy exchange of equipment plays an important role in the choice for the type of LHV. The most used type of LHV is the

truck – dolly – semi-trailer combination (D). Other common types are the tractor – semi-trailer – center axle trailer (A) and the tractor – semi-trailer – semi-trailer (B). The combination truck – semi-trailer (C) and the combination tractor with two center axle trailers is less common, due to the fact that the modules which these types consist of are less prevalent among regular vehicles.

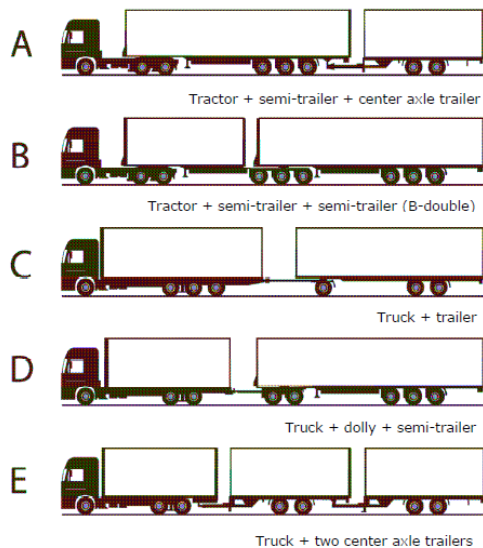


Figure 3 – Different allowed LHV Configurations

The number of axles per combination differs to the use. LHV's which are used for the transport of industrial and household waste are usually equipped with 7 to 8 axles. In the container transport 9 to 10 axles are common. For the transport of flowers often there are no more than 6 axles necessary and in the retail 7 to 8 axles are mostly used.

Journey patterns

Most LHV-transport (60.2%) takes place between two fixed locations, like auctions, ports, factories and distribution centers. Sometimes an LHV has a third stop (combined transport) or is used for distribution. Some LHV's are decoupled during the journey. For example in the container transport the LHV is sometimes decoupled at the border, after which the load is carried in two regular vehicle combinations into the neighboring country. In all cases LHV's replace normal truck journeys. That means LHV's do the same job as regular vehicle combinations only with a larger amount of goods. LHV's drive an average of 416 kilometers per day, that comes down to approximately 104,000 kilometer a year. This distance corresponds with the distance travelled by regular vehicles that previously performed this work.

Logistics

There are various reasons to use LHV's or not. Not all regular truck journeys can simply be replaced by LHV's. This is demonstrated by the slow increase of LHV's in The Netherlands. This slow increase cannot be caused anymore by the uncertainty about the trial status. The Dutch Ministry of Infrastructure and Environment is unambiguous for years now in that the

admission of LHV's in The Netherlands is irreversible. The reason why LHV's can only be profitably used under certain conditions is in the logistic process and the possibilities of the vehicle concept itself. Below some examples are given.

Table 1 – Logistics preconditions of the profitable use of LHV's

Preconditions profitable use of LHV's	
Weight	When transporting (bulk) goods, it is generally difficult to remain within the 60-Tons weight limit. The difference between 50 Tons for a normal road vehicle and 60 Tons for an LHV is too limited to justify the use of LHVs. For example LHV's are not suitable for the transport of certain heavy vegetables (like cabbages) because the maximum weight of 60T will be easily exceeded.
Frequency	A frequent volume of goods between two points (also return load) is necessary to make the use of LHV's profitable.
Distance	On short distances, because of longer loading and unloading times, the extra investment in an LHV would not be justified.
Combination of containers	In practice, there are only limited possibilities to use combinations of 40ft and 20ft containers, or three 20ft containers. This is due to the limited availability of 20ft containers, and due to the heavy weight of 20ft containers because these are usually heavily loaded.
Accessibility location	Many locations are not within reach for LHV's for safety reasons. For example some companies like to use LHV's for the transport of chickens but farms are often located at narrow roads.
Handling volume	Customers and shippers are sometimes unable to handle all the aspects that are involved in the processing of an LHV. For example, a logistics facility may be equipped to receive one 20ft container, but not three 20ft containers.
Time pressure	Due to time restrictions, sometimes it is not possible to combine cargo for transport in containers via an LHV. In some cases the containers must be quickly returned to the shipping companies.
Tracking & Tracing	It is easier to monitor goods flows via inland shipping and rail than via road transport (LHVs).
Fuel price	Higher fuel prices work to the advantage of intermodal transport because fuel costs constitute a smaller part of costs in the intermodal chain than in the unimodal chain via road transport.

3. Impact on the modal split

Central in the European debate on LHV's is the fear for a reverse modal shift from inland shipping and rail transport to road transport. The line of thought is that more efficient road transport will become cheaper and therefore shippers automatically would turn to this modality. Also a rebound effect would arise: because road transport becomes cheaper, the demand for road transport will increase. In the last argument it is unclear where the extra transport demand comes from, although this is probably far more complicated and connected to global economy issues like cheap labor, mass production and the stimulation of economic drivers by policies of governments. The suggestion is raised, especially by the rail lobby, that

if LHV's were allowed throughout Europe, all regular truck journeys would be replaced by LHV's, thus creating severe problems for environment, infrastructure, safety and the future growth of freight rail. The debate is quite emotional. A more rational debate is needed. The extensive research in the way LHV's are being used in the Netherlands can be a contribution to that. This chapter presents the results of modal split measurements at intermodal terminals and starts with the results of opinion polls among stakeholders involved.

Research results

The opinion of stakeholders is supported by the journey analysis of 118 LHV-companies (2010) and 51 Dutch intermodal terminals (in 2008 and in 2011). The journey analysis shows that only regular truck journeys are replaced by LHV's. Among the majority of companies two LHV journeys correspond to three regular journeys. Because this concerns regular goods flows, for example from a production location or supplier to a distribution centre, the LHVs are used in a similar way as regular vehicles. This means an increase in road transport efficiency. The transported volume remains the same, but, where empty vehicle kilometres on the return journey used to be frequent, due to the use of LHVs the number of empty vehicle kilometres has declined. From the measurements of the incoming and outbound good flows at sea and inland terminals it appears that 75% of the goods is not transported by LHV's and the modal split remained unchanged.

In The Netherlands inland shipping has a large share in the total transport (domestic and international) of goods. In Tons, shipping is the largest modality in international inland transport. In Sweden, where LHV's have a long tradition, the rail transport sector has a large share. In Sweden that share is even higher than in Austria, where the rail sector is actively state supported and road transport actively discouraged. Typically, both in Sweden and The Netherlands, the share of road transport in the last years decreased, while in countries with the largest European rail operators, France and Germany (in spite of modal shift policy in France and the MAUT in Germany), the share of road transport only increased in the last decades.

Table 2 – Modal split in tonne-km (2009)

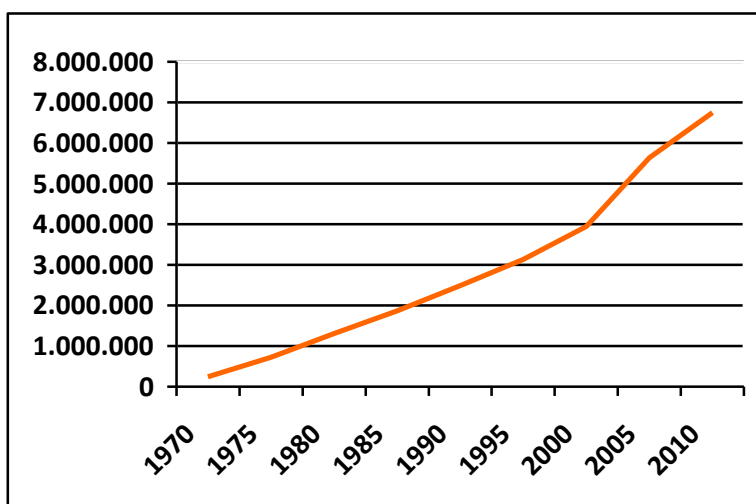
	Road	Rail	Inland Waterways
Belgium	72.9	12.8	14.3
Bulgaria	67.4	11.9	20.7
Czech Republic	77.8	22.1	0.1
Denmark	90.8	9.2	0.0
Germany	67.0	20.9	12.1
Estonia	47.3	52.7	0.0
Ireland	99.3	0.7	0.0
Greece	98.1	1.9	0.0
Spain	96.6	3.4	0.0
France	81.0	15.0	4.0
Italy	90.4	9.6	0.0
Cyprus	100.0	0.0	0.0
Latvia	30.2	69.8	0.0

Lithuania	59.9	40.1	0.0
Luxembourg	94.6	2.3	3.1
Hungary	78.8	17.1	4.1
Netherlands	63.8	4.9	31.3
Austria	59.5	36.4	4.1
Poland	80.5	19.4	0.1
Portugal	94.3	5.7	0.0
Romania	60.3	19.4	20.6
Slovenia	84.0	16.0	0.0
Slovakia	77.9	19.6	2.5
Finland	75.7	24.1	0.2
Sweden	63.2	36.8	0.0
UK	87.8	12.1	0.1

For domestic transport road is the dominant modality in Tons (84%) as well as in performance (73%). The rail sector cannot compete with the other modalities because of a combination of quality, flexibility, price and lead time on short distances, and therefore concentrates on long distance (international) transport. The share of inland water transport increased over the period 1994 – 2009 due to the growth of container transport (see fig.5).

Container transport with LHV's

For some goods, like bulk goods, road transport never will be the preferred modality. Each modality through its distinguishing features seems to take its own 'natural' share of the market transport demand. Apart from some niches like car transport, in the market of container transport the modalities are more in competition for market share, although it seems that rail transport, inland shipping and short sea shipping are more competing amongst each other than with road transport. In the monitoring research on modal shift extra attention is paid to container transport. Thirty LHV-companies in the container segment have been interviewed. The enormous increase of containerization has to be kept in mind. This can be illustrated by the growth of container transport in the Port of Rotterdam.



Bron: Port of Rotterdam

Figure 4 –Transport of containers in numbers in the Port of Rotterdam 1970 – 2010

The market of transport of containers is still growing. The result is that the competition between the modalities in this market segment still is very strong. The development shows a decrease of the share of road transport and an increase of inland shipping.

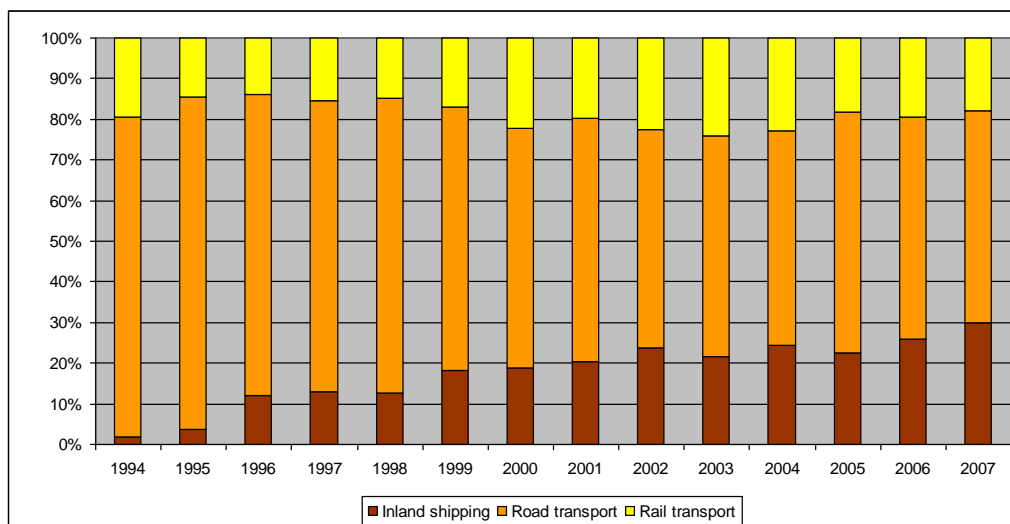


Figure 5 – Development of the modal split in Tonne-kilometres for containers (domestic transport)

All 30 companies that use LHV's for the transport of containers carry exclusively sea containers. The companies indicated that they are not active in the continental container/loading unit segment because they are not permitted to use LHVs to transport 45ft containers. The overwhelming majority (80%) use LHV's on journeys from the Port of Rotterdam directly to the final customers/shippers in the hinterland. The combination of a 40ft and a 20ft container is most common.

To illustrate:

On behalf of two terminal operators in the hinterland, namely the Barge Terminal Tilburg (BTT) and the Container Terminal Twente (CTT), LHVs are deployed between the terminal and Rotterdam. During weekdays both terminals have two LHVs that constantly drive between the terminal and Rotterdam. Although the majority of the containers is shipped by barge, part of the containers are always shipped via the road because of the processing of individual 'fast' containers from and to the port. So-called fast containers are containers that must be delivered to the client shortly after arrival in the port. In this case, the client is literally waiting for his cargo. In opposite direction, some containers must be delivered to the port in the shortest possible time because, in accordance with the container service's sailing schedule, they must be ready for shipping on time. Clients are willing to pay more than they would need to pay if these containers would be shipped by barge.

Most of BTT's (Barge Terminal Tilburg) clients are located in the Brabant region. A relatively high share of the goods shipped via containers consist of high-grade goods (electronics from Philips, Sony, Samsung, etcetera). The company focuses on intermodal transport: 75% is shipped via rail or inland shipping, 25% is shipped via the road. In total around 10% is shipped by LHVs. When LHV's are welcome in Belgium, this company would use them for transport of the 'fast containers' to and from the port of Antwerp, who are now being transported by regular trucks.

4. Safety

Driving from one European country to another we can see differences in spatial planning and road network design. There are for example essential differences between the neighboring countries The Netherlands and Belgium, all historically grown. The division in The Netherlands between urban and no-urban area's is quite clear. Main roads are mostly planned outside urban areas. That makes it easy to keep LHV's away from local urban roads. In Belgium many main roads go through urban areas. There is often little or no infrastructure for cyclists and mopeds. In the Netherlands, the bicycle is an important means of travel, both for travel to and from work or school as for recreational purposes. The condition of separate infrastructure therefore leads not to a drastic curtailment of access for LHV's. Vulnerable road users are protected. The performance of the Netherlands on road safety in general and with regard to the safety of LHVs in particular, cannot be dissociated from the spatial planning and road network design. In general, it is clear that the Netherlands is one of the safest countries in the world when it comes to road safety. Coincidentally, so is LHV number one country Sweden, a completely different country when we look at geography. But outside the vast, open nature areas in Sweden, the urban areas show similar infrastructural and spatial land use as in many other European countries.

From the outset it was and is the intention in The Netherlands that LHVs mainly use motorways and main roads. In fact, they should be driving on roads where already a large number of heavy freight traffic is present, typically to and from industrial areas, ports etc. The Netherlands has an intricate network with many connections. The motorway network and some main roads are managed by the national road administrator Rijkswaterstaat. All provinces and municipalities, some 450 in total, manage each within their own territory the underlying road network. Whether or not a road is suitable for LHVs in the Netherlands is determined by the road authorities. In order to assist in the evaluation of roads, a guide line was made. In this guide line the whole road network in all possible traffic situations is identified. Each situation is evaluated when LHVs are allowed to be safe and when not. It is the responsibility of the relevant road authority to allow LHVs or not. Considering the network available for LHV's, the support for LHV use with road authorities is quite large.

During the LHV trials several monitoring studies took place. Apart from extensive analyses of all incidents involving LHVs, there are also interviews with drivers, trainers, examiners and road inspectors. As in the earlier pilot phase from 2004 - 2006, a survey was held among 1000 car drivers. In addition, the traffic situation in several key areas was examined.

Accidents

Between 2007 and July 2010 the police recorded 19 incidents involving a LHV. In one case a person was injured. In all other cases only material damage was reported. In addition, companies themselves reported 35 incidents. In one of these cases the victim had to be admitted to hospital. In none of the accident vulnerable road users were involved.

The research question was whether these accidents were due to the characteristics of a LHV compared to a regular freight vehicle. These characteristics are the extra length and possible swerving behavior of the combination. Eight accidents were clearly not related to the characteristics of a LHV, even not with the characteristics of a regular freight vehicle. An example is a driver who is unwell and collides against the LHV. All other cases are typical truck accidents and it cannot be established with certainty whether the characteristics of an LHV played a decisive role.

From the interviews with LHV drivers, it is noted that they are themselves suspicious of the LHV's length in relation to special conditions (rain, slippery road surfaces) and driver behavior (misjudgment of vehicle length when changing lanes). There is a possibility that LHVs, because of their two pivot points, are more prone to sideways motion than regular trucks, but research to date has not yet provided proof of this. At the start of LHV trials in the Netherlands a LHV configurations were tested on a test track specifically to monitor it's behavior in different circumstances. No dangerous situations were noted.

In the next survey of traffic safety in 2011, five new incidents were added. In one case, the characteristics of an LHV seem to have led to the accident. Judging from the location where the accident happened was unlikely. The company in question confirmed that the cargo vehicle did not drive as LHV.

Public perception

In 2005, 1000 car drivers were questioned about LHV's. Half of the group was informed in advance about what exactly a LHV was and what the characteristics were. The other half received impromptu questions and were presented movies. In the videos the respondent saw three different maneuvers (overtaking, crossing an intersection with two lanes to turn right) of interacting with a LHV and was asked to indicate the risk. Although both groups had no great fears, it appeared that the prior informed group was more critical than the group who was not informed. The first group was previously made aware of the existence of extra-long trucks, where the other group seemed to perceive the LHV as a regular truck. Combined with the overall good results of LHV use in practice, the outcome of this survey made it clear that it was not a good idea to launch a public campaign towards road users informing them specifically about LHV's. Confidence in the safe merging of LHVs was so great that the risk of underestimating the additional security risks of a LHV was taken for granted. On the other hand, it made perfectly clear that the general public can easily be made afraid of 'monstertrucks', which was a clear aim of several publications of the rail lobby in Europe.

In 2009 another survey was held among 1000 car drivers. There is little resistance to LHVs. In general, people do not like freight vehicles, but in doing so most respondents indicated stated that road haulage is a 'necessary evil' and essential for the economy and our daily lives. A

quarter of the respondents think that the road safety will improve by allowing LHVs and an equal number think just the opposite. The same applies to the impact of LHVs on the traffic flow, where a third expects a positive effect. Most respondents feel safe in traffic (95%). Respondents who were less positive about freight and/or LHVs, often feel unsafe in traffic. The majority of motorists do not feel unsafe meeting LHVs (85%). People who do feel unsafe with LHV's point at the alleged larger blind spot of LHVs, longer stopping distances and the alleged lack of oversight of the driver on the rest of the traffic. The requirements for the admission of LHVs in the Netherlands satisfies 93% of all respondents.

5. International transport

During several surveys, drivers and managers of transport companies were asked if they had any proposals or wishes concerning the further development of LHV use. The majority (66%) of LHV companies are satisfied with the current preconditions under which LHVs are permitted to drive in the Netherlands. Of the companies that currently do not use LHVs, 94% indicated that they do not need the preconditions to be modified. Those companies that do want the preconditions to be modified, all want to use LHVs internationally.

The main reason why companies indicated that they do not want to use LHVs is due to the restriction on the weight limit. Not every country in Europe will permit a weight limit of 60 Tons. This means it is important to gain insight in the minimum required weight category. According to the questionnaire the needs differ strongly. It is also striking that, among non-users of LHVs, the minimum required weight limit is higher than among LHV companies. This could be due to the fact that companies that have gained experience with LHVs see better uses than non-users, e.g. through different cargo combinations.

Because of volume density and empty weight of the equipment, in particular in the container and bulk transport sectors, the expectation is that companies would require a minimum weight of over 55 Tons. However, the majority of container companies would be satisfied with a minimum weight that is below 55 Tons. The waste/bulk transport sector has a large need for heavy tonnage capability. This market segment is less suited for international transport via LHVs. The ornamental horticulture sector can make do with a relatively low tonnage. The retail sector shows huge differences with regard to the required tonnage.

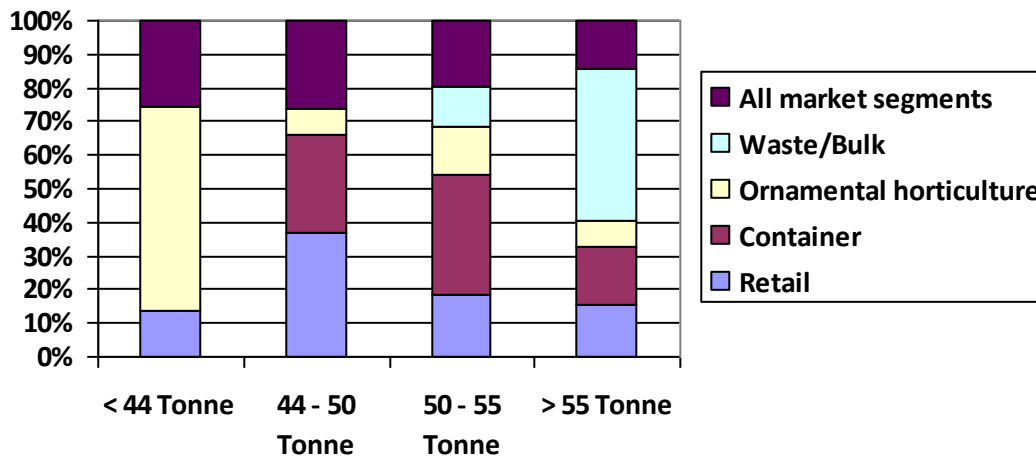


Figure 6 – Minimum required weight limit for international transport (survey LHV companies 2011)

6. Conclusions

The situation in the Netherlands has its specific details, but is in general not unique. The LHV is not in all situations the best transport solution. It can be a valuable part of road transport as a means to bring goods in larger quantities than regular trucks. Just like bigger containerships and the A380 merely organise higher productivity.

There are differences when we look at national transport policies. The Netherlands was always keen to liberalise freight transport and specifically was one of the first to deregulate rail freight transport and to invest in a dedicated, state of the art, rail freight line connecting the largest harbour in Europe to the largest economy in Europe. For the 20+ private rail companies operating in The Netherlands, the LHV is not a threat. They have more concern about the lack of flexibility, the shortage of rail capacity in other European countries (where priority is with passenger capacity) and restrictions due to poor interoperability throughout Europe. Short Sea Shipping and inland shipping are being stimulated with passion. Compared to a train or a ship, road transport is simply more flexible and often more reliable. Apart from that, most European transports are done by trucks because roads are the dominant or the only available infrastructure for the purpose. Inland shipping and rail have a growing potential when it comes to larger distance transport of large quantities of containers. In that case, no road freight solution, with or without LHV's will be able to compete with these modalities on price. Only for speed or more individual deliveries trucks will take over. This is a reality that is witnessed worldwide. Looking at the modal split in Western Europe, it seems that an active modal shift policy is not helpful in reducing road freight. On the contrary, if the statistics are taken as evidence.

The maximum permissible weight of 60 Tons seems to be an extra insurance that the use of LHV for transport efficiency on the road will not do so at the expense of the market shares of

other modes. A lower maximum permissible weight of say 40 or 44 Tons would prevent the use of LHV in some market segments. In this case, the expectation of efficiency on the road should be adjusted downwards since less regular trucks can then be replaced by LHV's.

Regarding road safety, the Dutch situation is less an example for other European countries. The Netherlands, as well as Sweden, are highly regarded when it comes to road safety. A number of features in the planning and design of the road network contribute to this. The secure admission of LHVs in the Netherlands was facilitated without additional investment in infrastructure. The controlled admission of LHVs in the Netherlands can be seen as a success and even serves as an example for the rest of the road freight. In contrast, it is shown that the admission of LHVs reduced the total number of truck movements. It also appears from the monitoring that LHVs driving on roads where already many trucks are present. This will also apply to other countries where LHVs are allowed. The safety gap between a regular truck combination and a LHV is much less than between a car and a truck. Looking at the fast development of clean(er) engines and ITS systems in road traffic, it is only a matter of time before road traffic can make a giant leap in cleaner, safer performance and in better use of the available road capacity.

Table 3 – The degree to which features count for just for The Netherlands, Europe-wide or just in some regions of Europe

	Features	TD	EW	SR
1	Market segments involved in LHV's		X	
2	Use of LHV's on fixed routes		X	
3	Considerations of a modal choice		X	
4	Rail transport, inland/short sea shipping are more competitive to each other than to road		X	
5	High share of inland shipping in modal split	X		
6	LHV's means 100% replacement of regular trucks		X	
7	Maximum total weight 50 Tons commercial vehicles			X
8	Minimal required weight to be profitable		X	
9	Fuel reduction by use of LHV's		X	
10	Reduction of emissions by use of LHV's		X	
11	Type of landscape			X
12	Technological performances LHV's		X	
13	Spatial planning and network design	X		
14	Number of road administrations		X	
15	Location of supermarkets	X		
16	Traffic intensity			X
17	Public perception of LHV's			X
18	High performance of traffic safety			X
19	Conditions LHV-exemptions (qualification LHV-driver)	X		

TD Typical Dutch

EW Europe-wide

SR Some Regions of Europe

The cross-border use of LHVs is an economic necessity. Belgium and the Netherlands face a high level of congestion in the ports of Antwerp and Rotterdam and on the busy road infrastructure in between. Both ports have plans or are already working on expansion. The share of Eastern Europe, particularly Poland, in international road transport is increasing. Germany remains an important transit country for all these flows. Investments needed to put more freight on rail seems not widely available. Most countries prefer to invest the available funds in high speed passenger lines. Insisting on preventing road transport from becoming more efficient and greener seems foolish and contra productive. In the Netherlands it is proven that controlled admission of LHVs is possible and that this contributes to less trucks being used, without any negative effects on other modalities. The EMS vehicle appears to be a sound package deal meeting all demands concerning safety, infrastructure, environment and economics.

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