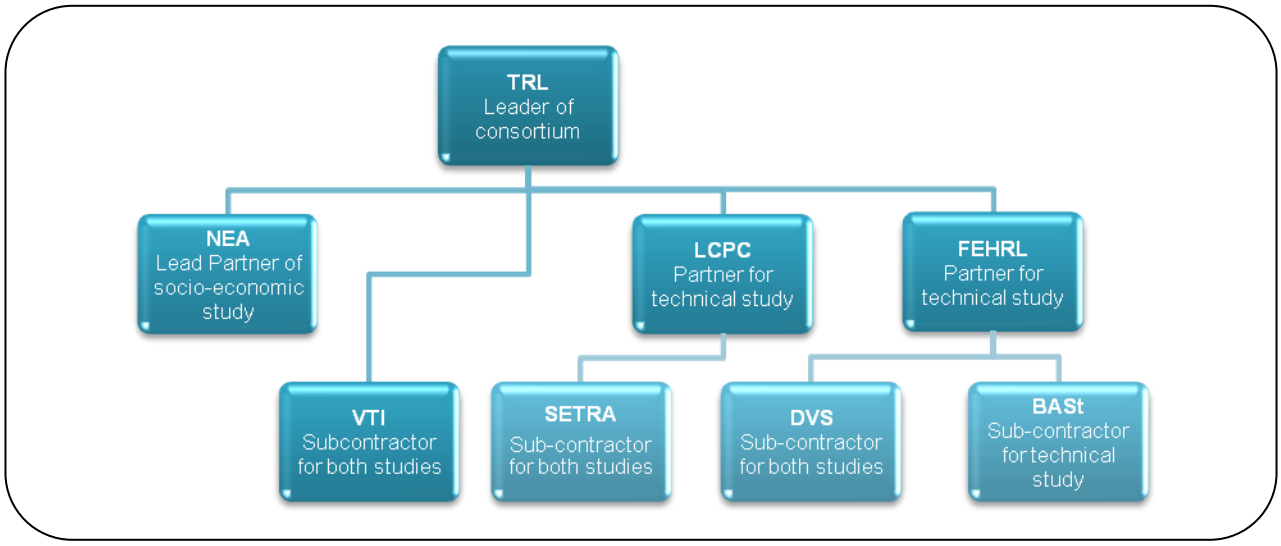
Assessing the likely socio-economic and technical effects of amending European legislation on heavy vehicle weights and dimensions

The project consortium

The consortium will be led by TRL, who have been extensively involved in the two recent and ongoing UK studies of the weights and dimensions issues and will contribute to both the socio-economic and the technical parts of this study. However, the socio-economic study will be led by NEA of the Netherlands and further supported by Setra of France, VTI of Sweden and DVS of the Netherlands. The technical study will be coordinated by TRL and supported by LCPC and Setra of France, VTI of Sweden, FEHRL, BAST of Germany, and DVS of the Netherlands. The consortium structure is outlined below.



The current situation

Currently the maximum length of goods vehicles for use in the European Union, set by Council Directive 96/53/EC, is limited to 16.5 metres for articulated vehicles and 18.75 metres for drawbar combinations. The Directive does not set an absolute weight limit, but specifies certain limits which, if met, guarantee free circulation of goods vehicles within the EU. The maximum weight limit for general EU circulation is 40 tonnes carried on a 5 axle vehicle. However, some countries deviate from this standard, for example, in Belgium the maximum weight limit for general freight on a 5 axle vehicle is 44 tonnes (International Transport Forum, 2007). Similarly, Directive 96/53/EC specifies a maximum height (4m) which guarantees free circulation throughout Europe but permits Member States to deviate from the maximum height limit within their own national traffic. Several countries take advantage of this to permit slightly taller vehicles and some, such as the UK, have no height limit at all. This has resulted in some sectors carrying low density goods to use vehicles of up to around 4.9m in height giving approximately $30m^3$ more volume capacity than a standard 4m tall artic (roughly equivalent to increasing the length of a 4m tall vehicle by 4.5m). This has also encouraged the use of double decked trailers that can double the pallet capacity of vehicles used to carry low density delicate goods that cannot be stacked to the full height of the trailer.

The Directive also allows Member States to permit vehicles or vehicle combinations, deviating from the standard lengths specified, to carry out certain national transport operations providing they do not significantly affect international competition in the transport sector. This allows for longer vehicle combinations to be assembled from the existing vehicles available in the community – the modular concept or the European Modular System (EMS) as it has become known. This system has been used for a number of years in Sweden and Finland to permit vehicles of up to 25.25m length and 60 tonnes maximum permitted mass.

Proposals for change

In recent years a range of stakeholders have made proposals for changes to the current situation. For example, Sweden and Finland would like to use EMS vehicles in bilateral international traffic and there have been several proposals for wider spread use either nationally or internationally in Europe. Permitting 25.25m combinations nationally has already been rejected in the UK and Germany but is under consideration in several other European countries including Belgium, Denmark, and the Netherlands. France is still investigating the concept of EMS, but the trial planned for 2010 was suspended by the government.

Assessing the likely impacts of this sort of change to weights and dimensions regulation is technically complex and difficult, a problem which is exacerbated by the sensitive and emotive nature of the debate amongst different interest groups. Although arguments vary by stakeholder and proposed change, proponents of such changes tend to argue that allowing a greater quantity of goods to be transported on each vehicle will reduce the total quantity of vehicle movements (vehicle*km) and thus improve the efficiency of road transport, reducing operating costs, congestion, emission of pollutants and potentially also reducing the number of accidents. One example of many such arguments can be seen at http://www.modularsystem.eu/.

In contrast, opponents of these changes tend to argue that the reduced cost of road transport will improve the competitive position of road transport with respect to rail, inland waterways and short sea shipping. It is claimed that this will induce a mode shift effect where goods that were previously transported by other modes, or in multi-modal transport operations, will be transferred to road. It is also claimed that the reduced price of road transport will result in an increased demand for road transport on the basic principle that if something is cheaper demand will increase (i.e. companies may source products from further afield and logistics operations may save money by centralising warehousing and travelling further). It is also often stated that using such vehicles will cause significant problems for road infrastructure and increase safety risks. Opponents argue that these effects will at least undermine the benefits achieved from consolidating existing loads transported by road and at worst result in a substantial increase in congestion, pollution, and accidents. One example of many such arguments can be seen at http://www.nomegatrucks.eu/.

These sorts of arguments have become very polarised and are generally centred on whether or not 25.25m vehicle combinations should be permitted at maximum authorised masses of 60 tonnes across Europe. However, this is not the only proposed change to Directive 96/53/EC that has been suggested in recent years. For example, there have been a number of proposals to increase the maximum length of single trailers, often without an accompanying increase in maximum permitted mass. For example, the refrigerated transport industry would like to see an increase of about 20cm in order to allow better circulation of air around goods, improve the consistency of temperatures and to increase the energy efficiency of the refrigeration. The car transporter industry would like to permit two-vehicle combinations of up to 20.75m in overall length, including the length of parts of cars

that overhang the transporter, as well as small increases in width to accommodate better safety for operatives loading vehicles onto the trailer. In between these extremes, articulated vehicles of up to approximately 18m length are being trialled in Germany, the Czech Republic and Italy, and the UK is assessing the feasibility and impact of permitting articulated combinations of up to 18.55m overall length. Other stakeholders have proposed amending the maximum mass limits for international use of standard articulated and drawbar vehicle combinations, for example to 44 tonnes on either 5 or 6 axles and 48 or even 50 tonnes on 6 axles.

Previous research

There has been a wide range of previous research and scientific studies of this subject in recent years. This includes the following:

Authors	**Year**	**Title**	**Project Sponsor**	**Availability**
Salet, Aarts & Honer et al	2010	Longer and Heavier Vehicles in the Netherlands: Facts, figures and experiences in the period 1995-2010	NL Government (DVS)	http://www.verkeerenwaterstaat.nl/kennisplein/4/0/400919/EN%20LHVs%20in%20the%20Netherlands%20final.pdf
Arcadis, Stegeman, Rakic	2010	Monitoring traffic safety Longer and heavier vehicles	NL Government (DVS)	http://www.verkeerenwaterstaat.nl/kennisplein/3/9/399381/Monitoring%20traffic%20safety%20-%20Longer%20and%20Heavier%20Vehicles%20(LHV).pdf
Dijkers & Huigren	2009	Survey car drivers Longer and heavier vehicles	NL Government (DVS)	http://www.verkeerenwaterstaat.nl/kennisplein/3/9/399374/Survey%20car%20drivers%20-%20Longer%20and%20Heavier%20Vehicles%20(LHV).pdf
ASFiNAG	2009	Longer heavy vehicles: Management summary	Austrian	Not freely available
Verkehrsplanung Kafer	2009	Der Gigaliner Auswirkungen auf den kombinierten verkehr in Osterreich	Austrian	Not freely available
Winklebauer	N/K	Sischerheitsaspekte gigaliner	Austrian	Not freely available
Arcadis, Stegeman, Rakic	2010	Monitoring traffic safety Longer and heavier vehicles	NL Government (DVS)	http://www.verkeerenwaterstaat.nl/kennisplein/3/9/399381/Monitoring%20traffic%20safety%20-%20Longer%20and%20Heavier%20Vehicles%20(LHV).pdf
Dijkers & Huigren	2009	Survey car drivers Longer and heavier	NL Government	http://www.verkeerenwaterstaat.nl/kennisplein/3/

Authors	Year	Title	Project Sponsor	Availability
		vehicles	(DVS)	9/399374/Survey%20car%20drivers%20-%20Longer%20and%20Heavier%20Vehicles%20(LHV).pdf
Christidis & Leduc (JRC)	2009	Longer and heavier vehicles for freight transport	European Commission	http://ec.europa.eu/transport/road/events/doc/2009_06_24/2009_jrc52005.pdf
Doll *et al* (Fraunhofer)	2009	Long term climate impacts of the introduction of mega-trucks	Community of European Railway and infrastructure companies (CER)	http://www.nomegatrucks.eu/deu/service/download/fraunhofer-studie.pdf
De Ceuster *et al (TML)*	2008	Effects of adapting the rules on weight and dimensions of heavy commercial vehicles as established within Directive 96/53/EC	European Commission	http://www.tmleuven.be/project/weightanddimensions/home.htm
Knight *et al (TRL)*	2008	Longer and/or longer and heavier goods vehicles (LHVs) – a study of the likely effects if permitted in the UK: Final report	UK Department for Transport (DfT)	http://www.trl.co.uk/online_store/reports_publications/trl_reports/cat_vehicle_engineering/report_Longer_and/or_Longer_and_Heavier_Goods_Vehicles_LHVs__a_Study_of_the_Effects_if_Permitted_in_the_UK_Final_Report.htm
Vierth *et al (VTi)*	2008	The effects of long and heavy trucks on the transport system: A report on a Government assignment	Swedish Government	http://www.vti.se/templates/Report____2797.aspx?reportid=8830
K+P Transport consultants	2007	Verkehrswirtschaftliche Auswirkungen von innovativen nutzfahrzeugknozeptum II	German government	http://www.nomegatrucks.eu/the-facts/independent-research/k-und-p-consultants/
Bachmann *et al* (IKA)	2007	Scientific study on the field test of a semi-trailer with extended length	Kogel trailers	http://www.big-maxx.com/files/webFM/redaktion/PDF/Gutachten%20ika.pdf
Friedrich *et al* (IVH University of Hannover)	2007	Auswertung des niedersächsischen modellversuchs zum einsatz von "gigalinern"	Niedersächsischen ministeriums für Wirtschaft,	http://cdl.niedersachsen.de/blob/images/C40627922_L20.pdf German Language only

Authors	Year	Title	Project Sponsor	Availability
			Arbeit, und Verkehr	
Glaeser *et al* (BASt)	2006	Auswirkungen von neuen fahrzeugknozeptum auf die infrastruktur des budesfernstraβennetzes	German Government	http://www.bmvbs.de/Anlage/Original_987986/BASt-Studie+Gigaliner.pdf German language only
K+P Transport consultants	2006	Verkehrswirtschaftliche Auswirkungen von innovativen nutzfahrzeugknozeptum	German Government	http://www.bmvbs.de/Anlage/Original_987987/K%2BP+Studie+Gigaliner.pdf German language only
TIMCONSULT	2006	The effect of permitting gigaliners on combined transport	UIRR	http://www.nomegatrucks.eu/deu/service/download/tim-consult-studie.pdf
Lumsden (Chalmers University)	2004	Truck masses and dimensions – Impact on Transport Efficiency		http://www.modularsystem.eu/download/facts_and_figures/20080522att04.pdf

The project team aim to take the results of all significant scientific studies into account during the forthcoming work so if there are any additional studies that should be added, please e-mail the project team with links or details at HVWD@trl.co.uk

It can be seen that a considerable evidence base already exists and examining the results of these studies shows that there is broad agreement on some of the expected effects, for example that larger vehicles would result in reduced operating costs in the road freight sector. However, in other factors such as the effects on modal split, traffic generation and infrastructure capacity and costs, the findings appear quite variable and overall conclusions range from strongly negative to strongly positive and all stations in-between.

Rationale and objectives for the new project

The mid term review of the 2001 white paper stresses the importance of freight transport logistics in ensuring sustainable and competitive mobility in Europe. In this context, the concept of co-modality requires a search for optimal efficiency in all transport modes and it was for this reason that the logistics action plan required a review of the legislation governing heavy vehicle weights and dimensions (Council Directive 96/53/EC). The debate on revisions to this Directive is a very sensitive one and the Commission have stated that they need to fully understand the economic implications of bigger and/or heavier vehicles as well as their technical implications for the road infrastructure, safety and the environment. The previous studies (De Ceuster et al, 2008; Christidis and Leduc, 2009) funded by the Commission have increased the Commissions understanding in these respects but some limitations remain, for example:

- Only a small number of the wide range of potential policy options (see proposals for change section above) were considered;
- The technical details of how any change could be implemented without causing safety risks or infrastructure damage were not fully assessed;
- The economic analysis was undertaken at an aggregate European level only and did not fully separate the impacts on different freight markets or geographical regions.

Combined with the diverse conclusions found in other studies, this led the Commission to consider that further research should be funded in order to investigate these additional matters in more detail. They proposed that work should be undertaken on two linked studies:

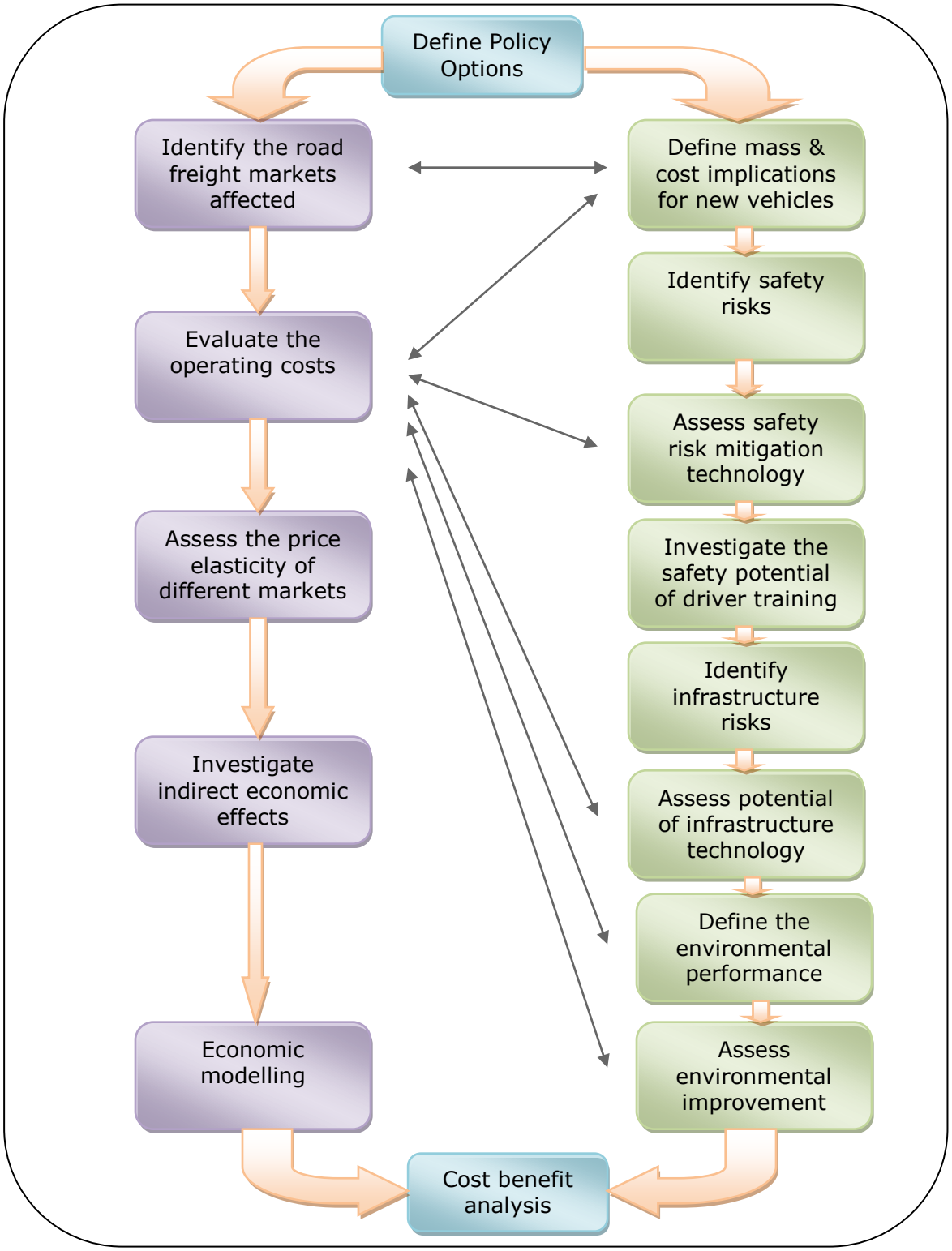
- An economic study to examine in more detail those areas where information is still lacking, such as differing effects in different regions and markets and the effect of changes over time;
- A technical study to consider not only the performance of the modular concept but the performance of other proposed changes.

In light of these objectives from the Commission, the consortium has proposed a study that aims to:

- Identify the findings common to previous studies and define common conclusions;
- Identify areas of disagreement between existing studies and investigate whether this is the result of:
    - Genuine scientific disagreement
    - Application to different geographic regions
    - Different scenarios for regulatory, road or vehicle design options
    - Different analytical tools
    - Different assumptions;
- Produce a common view of these areas of disagreement, accepted by all analysts involved in the original research wherever possible;
- Identify areas of genuine technical uncertainty and, wherever possible, undertake more detailed investigation to reduce that uncertainty;
- Rigorously catalogue and quantify the likely effects of a range of potential technical and policy measures that could affect the impact that any changes to weights and dimensions regulation could have;
- Propose and evaluate more detailed policy options.

Overview of the methodology

The consortium considers that the links between the technical and economic studies are very strong and that there are elements of work that are common to both. For example, the internal cost of road transport is a major influence in the socio-economic study. Changes to the total cost of transport are a significant output in their own right as well as having a strong influence on how the road industry would use bigger vehicles and what effect it might have on road freight transport demand and the modal split. However, the internal costs of road transport depend strongly on aspects of the technical study, for example, the level of safety equipment required, limitations in access to the road network because of infrastructure compatibility concerns, or the ability to incorporate aerodynamic improvements to improve fuel consumption. We have, therefore, proposed an interactive task structure as illustrated in the figure below.



Input from stakeholders will be a vital part of the project. However, the consortium considers that the arguments, positions, subjective views and anecdotal evidence have been well documented by previous studies and public forums. These exercises will, therefore, not

be repeated and stakeholder engagement will be firmly focussed on obtaining objective data to help inform and calibrate the additional analyses and explanation and interpretation from the authors of previous studies. Those in the freight industry (all modes) who feel able to contribute objective data to support the analysis and authors of previous studies or experts from industry or the wider research community that feel able to contribute evidence to the study should contact the project team at HVWD@trl.co.uk.

Outputs and deliverables

The project will deliver a comprehensive final report describing in detail all of the methods, analyses and results of the study. Publication will be at the discretion of the European Commission.