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COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT

Accompanying the document

Proposal for a Directive of the European Parliament and of the Council amending Council Directive 96/53/EC laying down for certain road vehicles circulating within the Community the maximum authorized dimensions in national and international traffic and the maximum authorized weights in international traffic

{COM(2013) 195 final}
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Table of contents

Glossary

Directive 96/53/EC[1] (hereafter referred to as such or as the 'Directive') concerns vehicles of categories M2, M3, N2 and N3 and their trailers of categories O3 and O4 as defined by Annex II to Directive 2007/46/EC[2]. These categories include the following vehicles:

- M2 and M3: Vehicles for the carriage of passengers, comprising more than eight seats in addition to the driver's seat, referred to from here on as 'buses' (for urban and for inter-urban transport). Buses and coaches are not differentiated for the purpose of this document;

- N2 and N3: Vehicles for the carriage of goods and having a maximum mass exceeding 3.5 tonnes, referred to from here on as 'heavy-goods vehicles' (HGV), 'trucks' or 'lorries';

- O3 and O4: Trailers with a maximum mass exceeding 3.5 tonnes.

In this document, the terms 'heavy goods vehicles', 'trucks' and 'lorries' all refer to vehicles of categories N2 and N3 with or without combinations of trailers O3 and O4. Heavy duty vehicles (HDV) refer to all HGVs and buses.

Combined transport is defined in accordance with Directive 92/106/EEC[3] as

"the transport of goods between Member States where the lorry, trailer, semi-trailer, with or without tractor unit, swap body or container of 20 feet or more, uses the road on the initial or final leg of the journey and, on the other leg, rail or inland waterway or maritime services where this section exceeds 100 km as the crow flies and make the initial or final road transport leg of the journey;

- between the point where the goods are loaded and the nearest suitable rail loading station for the initial leg, and between the nearest suitable rail unloading station and the point where the goods are unloaded for the final leg, or;

- within a radius not exceeding 150 km as the crow flies from the inland waterway port or seaport of loading or unloading."

Intermodal transport refers to transport of intermodal loading units (containers or swap bodies) using at least two different modes of transport as part of a transport chain with no limitation on the length of the road transport leg, nor of the other legs.

[1] Council Directive 96/53/EC of 25 July 1996 laying down for certain road vehicles circulating within the Community the maximum authorized dimensions in national and international traffic and the maximum authorized weights in international traffic; OJ L 235 of 17.9.1996, p. 59.

[2] Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailer, and of systems, components and separate technical units intended for such vehicles (Framework Directive); OJ L 263 of 9.10.2007, p. 1.

[3] Council Directive 92/106/EEC of 7 December 1992 on the establishment of common rules for certain types of combined transport of goods between Member States; OJ L 368 of 17.12.1992, p. 38.

- **PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES**

Identification

Lead DG: MOVE

Agenda planning: 2012/MOVE/013

This impact assessment (IA) is the basis for a proposal to be submitted to the European Parliament and the Council with the aim of modifying Directive 96/53/EC on the maximum dimensions of certain road vehicles autorized for national and international traffic and the maximum weight authorized in international traffic (hereinafter 'the Directive').[4]

The reason for the revision is founded on multiple requests coming from professional stakeholders, demonstrating a growing gap between the directive and the market. Following the 2011 White Paper on Transport[5], it was decided to launch a public consultation to assess the opinions on the status of the implementation of the Directive 96/53/EC and propose for a revision the issues already highlighted by the stakeholders.

o Organisation and timing

For the preparation of this initiative, DG MOVE set up an Impact Assessment Steering Group in which the following DGs took part: SG, ENTR, JRC, ENV, CLIMA, LS.[6] The Steering Group held five meetings between September 2011 and September 2012.[7] The Steering Group's comments were taken into account in the impact assessment.

o Consultation and expertise

External assistance has been used through a contract on specific technical issues with the French IFSTTAR laboratory and the Belgian Institute BRRC from November 2011 to April 2012. The consultants' role was to answer specific technical questions of DG MOVE on an ad-hoc basis. A stakeholder consultation was organised in two parts: 1) a public consultation via the Internet, which was open from 22 December 2011 to 27 February 2012[8], and 2) a targeted stakeholder consultation[9], consisting of four workshops organised by DG MOVE, with enforcement organisations (16 February 2012), vehicle manufacturers (6 March 2012), intermodal transport operators (2 April 2012) and road safety experts (26 June 2012). The Commission's standards in terms of stakeholder consultation[10] have been met.

- *Main results of the public stakeholder consultation*

Before launching the consultation, DG MOVE organised a meeting with representatives of the Member States on 26 October 2011 to discuss areas of possible scrutiny. Following this meeting the consultation was organised around the four following themes:

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4 Council Directive 96/53/EC of 25 July 1996 laying down for certain road vehicles circulating within the Community the maximum authorized dimensions in national and international traffic and the maximum authorized weights in international traffic; OJ L 235 of 17.9.1996, p. 59.

5 COM (2011) 144.

6 Two other DGs – CNECT and ECFIN – were invited to participate, but were unable to do so.

7 7 September 2011, 12 October 2011, 20 March 2012, 9 July 2012 and 9 September 2012.

8 A detailed summary of the outcome of the public consultation is available in Annex 1.

9 Summaries of the targeted stakeholder meetings are also available in Annex 1.

10 See COM (2002) 704.

- Theme 1: energy efficiency and CO_2 emissions, aerodynamics of the vehicles;
- Theme 2: intermodal transport of goods;
- Theme 3: controls, checks and enforcement of the Directive by the Member States.
- Theme 4: need for legal clarifications of derogations from the Directive for heavier and longer trucks;

300 replies from professional stakeholders were registered, as well as 700 responses from private citizens. The latter were largely identical, suggesting that members of some associations sent predefined answers. While the relevance of the proposed themes were confirmed by stakeholders, no other important topic was suggested during the consultation.

The key findings of the consultation can be summed up as follows:

- Theme 1: there is broad consensus on the objective to improve energy efficiency and fuel consumption by improved aerodynamics of heavy goods vehicles, especially by allowing rear flaps and new designs of the cabin. The same consensus applies with regard to a support to hybridization and to electric vehicles. For that purpose, stakeholders requested that some of the constraints set by the current Directive are released to accommodate these technological improvements (e.g. the weight of batteries).
- Theme 2: there is a general consensus on the necessity to accommodate containers of 45 feet length through an increase in length of the vehicle by 12 or 15 cm.
- Theme 3: most stakeholders of all kinds agreed that controls are not efficient and are insufficient in number. All means to improve the situation, including automatic systems would be useful. Professional stakeholders also highlight the necessity for harmonizing control procedures and sanctions at European level.
- Theme 4: the majority of stakeholders consider existing derogations as not sufficiently clear. Positions diverge on possible changes needed: Environmental NGOs, rail and combined transport associations as well as road safety associations advocate a restricted use of longer vehicles while manufacturers, the haulage industry and shippers highlight the energy efficiency of longer vehicles (two longer ones would be needed where currently three vehicles are required) and ask for a generalised authorisation of their cross-border use.

▪ *Main result of the targeted stakeholder meetings*

The targeted hearings of associations of enforcement inspectors, vehicle manufacturers and hauliers associations, intermodal transport stakeholders and experts in road safety yielded the following results:

- Enforcement associations underlined the benefits to be achieved through automatic enforcement methods such as weigh-in-motion systems (WIM), which allow enforcers to filter traffic and more efficiently target vehicles for manual checks.
- Vehicle and trailer manufacturers confirmed the potential for aerodynamic improvement as well as the market interest for such solutions. They underlined the different product development lifecycles (10 years for tractors and <2 years for trailers), and promoted the idea of performance-based standards instead of fixed limits for the new designs of both rear flaps and the front of new cabins.
- The intermodal stakeholders confirmed that properly designed aerodynamic devices would not be a problem for trailers on most rail wagons. They requested the current administrative burden related to 45’ containers to be reduced by a release of the need for special permits.

- Road safety experts highlighted the relation between braking distance and the weight of vehicles, the benefits of widening the driver's field of visions through an improved design of cabins and the need for signalisation of any additional element at the rear of a vehicle.

The policy options analysed in this IA reflect suggestions collected during the consutlation process. A great deal of the technical information contained in this IA has also been gathered during the consultation process.

o Consultation of the Impact Assessment Board

The draft report for this IA was submitted to the Impact Assessment Board

(IAB) on 21 September 2012. In its opinion of 19 October 2012, the IAB made a number of recommendations which were taken into account in the final draft. The most important amendments in comparison to the version submitted on 21 September are the following:

- The baseline has been strengthened by introducing data on key variables (fuel and carbon prices, number of km driven and fuel consumption) from the PRIMES-TREMOVE baseline. Data on other variables, such as on forecasted movements of 45' containers, is not available in the PRIMES-TREMOVE baseline or other sources that we have investigated, which is why only qualitative information could be provided. Moreover, expected developments of weights of vehicles, containerisation, transport routes and enforcement have been indicated.
- The qualitative and quantitative analysis of the IA have been better integrated, assumptions and calculations have been clarified, and it has been explained which Member States are likely to be most affected.
- While keeping the incremental approach of assessing Policy Packages, the comparison of Policy Packages with the baseline has been clarified. Moreover, the effectiveness as well as the efficiency of the Policy Packages in terms of total costs and benefits have been outlined.
- Views of stakeholders have been presented more thoroughly in the main text and in Annex 1 with regard to the main elements of the report.

- **PROBLEM DEFINITION**

Heavy duty vehicles transporting goods and passengers in Europe must comply with certain rules on maximum weights and dimensions. For each vehicle type, Directive 96/53/EC sets the respective maximum authorised length, width, height and weight (total weight and weight per axle). Vehicles which comply with these limits can perform international[11] transport operations within all EU Member States (Art. 3). To avoid that national operators benefit from undue advantages over their competitors from other Member States, they are bound, as a general rule, to comply with the limits set for international transport (Art. 4(1)). In line with the principle of subsidiarity, a number of derogations allow Member States to apply higher limits for transport within their own borders. The derogations concern the maximum height, the maximum weight (Art. 4(2)) and the possibility to employ longer vehicles in special transport, trials or with modular combinations of vehicles (Art. 4(3), 4(4) and 4(5)).

As explained further in section 2.2.1, these rules have been defined to strike a balance between requirements in terms of protecting the infrastructure as well as the environment, ensuring safety, energy efficiency and economic profitability. The infrastructure and the safety rules are important constraints on the possible evolutions of the vehicles. Concerning the infrastructures, three major issues are at stake :

- the weight per axle of the vehicle, which has the most important impact for road wear and tear,
- the total weight of the vehicle (relevant in particular for bridges),
- the capability of the vehicles to manoeuver, for instance in roundabouts and in urban areas.

These constraints will not be challenged by a revision of Directive 96/53/EC.

By avoiding technical hindrances at borders and ensuring fair technical conditions of competition to hauliers, the Directive aims at facilitating the internal market and ensuring the free movement of goods and persons in Europe.

- **Political context**

One of the key objectives of the Europe 2020 strategy[12] is sustainable growth aiming at building a more competitive low-carbon economy by notably increasing energy efficiency. In this context, the 2011 White Paper on transport[13] has put a clear emphasis on the need to reduce the CO_2 emissions from the transport sector with a reduction target of 60% by 2050 compared to 1990 levels. In the area of road transport, the White Paper has stressed that Directive 96/53/EC on the maximum weights and dimensions should be adapted to technological developments and new circumstances, such as the evolution of containerisation and new vehicle technologies improving aerodynamics.

Insofar as the review of the Directive could contribute to more harmonised framework conditions for freight transport, it is linked to the review of the road freight market announced in the White Paper and in the Commission's 2013 work programme. This review includes other initiatives to further integrate the road transport market, such as a stepwise approach to further opening national transport markets (including through cabotage) and a review of existing road user charging rules, which will also contribute to increasing the energy efficiency of road transport.

[11] International transport refers to intra- and extra-EU cross-border operations.
[12] COM (2010) 2020.
[13] COM (2011) 144.

The White Paper further aims at improving the resource-efficiency of the transport sector by making vehicles cleaner and more fuel-efficient, and by optimising the performance of multimodal logistic chains. This includes improving connections between modes and using each mode where it is the most efficient. Significantly increasing the loading capacity of road vehicles may result in adverse effects on infrastructure, road safety and other modes, thus undermining the aim of creating an efficient multimodal transport system. This option is therefore not evaluated in this impact assessment.

This initiative also builds on the draft Commission Regulation on type approval of heavy duty vehicles (HDVs) as regards masses and dimensions (currently under scrutiny by the European Parliament and due to be adopted by the end of 2012). This upcoming Commission Regulation (DG ENTR) will govern the conditions for manufacturing and distribution of heavy duty vehicles in the EU. It is developed in the context of the implementation of the type-approval Framework Directive 2007/46/EC[14] and of Regulation (EC) No 661/2009 ("General Safety Regulation")[15] in order to replace the current Directive 97/27/EC[16] with effect of 1 November 2014. It will introduce possibilities for new vehicles to deviate from maximum dimensions for small series by creating allowances for foldable aerodynamic devices at the side and back of vehicles within the limit of 500 mm at the back (when unfolded).

International standards would create no obstacles to such changes. The 1958 UNECE agreement on the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts[17] does not cover masses and dimensions of road vehicles nor does it include aerodynamic devices. On the one hand, no changes to international agreements will be required to amend Directive 96/53. On the other hand, failing the existence of international standards, there is a case to facilitate the roll-out of aerodynamic devices in this Directive.

Furthermore, the Commission is currently preparing a strategy to reduce the CO_2 emissions of HDV. In the preparatory work to establish this strategy (carried out by DG CLIMA), a number of actions have been identified to reduce HDV CO_2 emissions. One of them is the review of Directive 96/53/EC in order to facilitate the introduction of more energy-efficient road vehicles, including more aerodynamic vehicles. The review of Directive 96/53/EC may therefore contribute to the climate strategy.

Finally, legal uncertainties have long existed with regard to the derogations for longer vehicles in Art. 4 of the Directive. The wording of the Directive was considered to be insufficiently clear regarding the rules relating to the cross-border use of longer modular trucks. In light of these uncertainties and following requests from stakeholders, Vice-President Siim Kallas sent a letter on 13 June 2012 to the Chairman of the Transport Committee of the European Parliament (see annex 3). This letter provides guidance and considers the cross-border use of longer vehicles lawful if two Member States already allow

[14] Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles (Framework Directive); OJ L 263 of 9.10.2007, p. 1.

[15] Regulation (EC) No 661/2009 of the European Parliament and of the Council of 13 July 2009 concerning type-approval requirements for the general safety of motor vehicles, their trailers and systems, components and separate technical units intended therefor; OJ L 200 of 31.7.2009, p. 1.

[16] Directive 97/27/EC of the European Parliament and of the Council of 22 July 1997 relating to the masses and dimensions of certain categories of motor vehicles and their trailers and amending Directive 70/156/EEC; OJ L 233 of 25.8.1997, p. 1.

[17] Economic Commission for Europe Inland Transport Committee - Agreement concerning the adoption of uniform technical prescriptions for wheeled vehicles, equipment and parts which can be fitted and/or be used on wheeled vehicles and the conditions for reciprocal recognition of approvals granted on the basis of these prescriptions, 1958

this and if the conditions for derogations under Art. 4(3), 4(4) or 4(5) of the Directive are met. In particular, there should be no significant impact on international competition.

In a response to President Schulz of the European Parliament, President Barroso indicated in a letter of 26 July 2012 that the Commission would make a legislative proposal which would give an opportunity for the European Parliament to legislate on this issue if it wishes to do so and that until any revision of the Directive is fully implemented, the current Directive remains in force along the guidance provided.[18] Hence, given that existing uncertainties regarding Art. 4 of the Directive have been addressed and given that the legislator will have the opportunity to address the issue, as appropriate, in connection with the present revision of the Directive, this Impact Assessment will not address the issue of Art. 4.

o What is the issue or problem that may require action?

Against this background, new circumstances, technologies and user needs call for a revision of the Directive. More exactly, the main problem identified following the stakeholder consultation is that the limits set in the Directive are one of the obstacles to energy efficiency[19] in road transport and to intermodal transport. Moreover, the effectiveness of the Directive is hampered due to a lack of compliance by transport operators. Hence, the main problem consists of two parts described in more detail below.

- *Part 1: Certain limits on weights and dimension set by the Directive constitute obstacles to energy efficiency gains of road vehicles and to intermodal transport operations*

As mentioned above, rules on weights and dimensions of commercial vehicles are meant to strike a balance among several, and in part competing requirements, namely: i) energy efficiency and environment; ii) economic efficiency; iii) safety; and iv) infrastructure needs. This balance has to be valid EU-wide to ensure a level playing field.

The current legislation, conceived in the 1990s to accompany legislation regarding the opening of the international road transport market, reflects the conditions present at the time. Several elements have changed in the meantime, implying that current rules no longer correctly balance the various elements and needs.

In particular, energy dependency and climate change considerations require that greater emphasis is now given to the energy efficiency of vehicles. Developments in maritime transport and containerisation have an impact on the logistics and the economy of road operations. Vehicle and infrastructure technology has advanced. Safety concerns have become more prominent.

Furthermore, the way manufacturers adapt their vehicle design to demand – within the regulatory limits – is likely to produce suboptimal results. This is because vehicle operators do not pay the full price of negative externalities such as climate change, energy dependency

[18] http://www.michael-cramer.eu/fileadmin/documents/2012-07-31_-_Barroso_reply_to_Schulz_on_Gigaliner_issue.pdf

[19] Technically, 'energy efficiency' means using less energy inputs while maintaining an equivalent level of economic activity or service; 'energy saving' is a broader concept that also includes consumption reduction through behaviour change or decreased economic activity. In practice the two are difficult to disentangle. (see also footnote 2 of the Energy Efficiency Plan 2011; COM (2011) 109). This Impact Assessment will discuss energy efficiency, depending on the context, in terms of different units: energy consumption per vehicle kilometre, energy consumption per tonne kilometre or energy consumption per passenger kilometre.

and the social cost of accidents, and are therefore attributing lower value to these features than it would be desirable.

Some of these problems have already been recognised by the policy maker and tackled with regulation imposing, for example, minimum safety and environmental standards, but as a result, the regulations adopted over the last two decades and the evolving importance given to respective policy goals has also altered the balance between the various elements of the problem. It can be said today that:

- Infrastructure and safety still represent a constraint to weights and dimensions and do not allow sizeable increases of vehicles. On the other hand, reducing the loading capacity would imply lower economic and environmental efficiency, since more kilometres would have to be driven to transport the same quantity of goods;
- The total weight limits have been set in a precautionary manner in the Directive. A limited increase in the maximum authorised weight would still be possible for most categories of heavy duty vehicles without being harmful to main roads, which are built to resist an axle weight of 11.5 tonnes. This safety margin would leave space for a slight increase of the maximum permissible weight of electric vehicles to compensate for the additional weight of their batteries;
- Since larger containers are becoming ever more common and have environmental advantages, the trade-off between a little additional length and safety/infrastructure problems is favourable to the former;
- The same consideration can be applied to aerodynamic appendices, in view of the greater social cost of energy these days.

In short, as reported by stakeholders, especially hauliers and manufacturers, the Directive imposes limits which, although pertinent in the 1990s, do no longer strike for some of them the right balance between the four above-mentioned requirements and today create undue obstacles to energy efficiency gains and to intermodal transport. In this respect, the limits acting as obstacles can be regrouped under two main groups:

Root cause 1) Certain maximum weights and dimensions prevent the market uptake of more aerodynamic, electric and hybrid trucks and reduce the attractiveness of certain coach services

A. Certain dimensions prevent the deployment of aerodynamic solutions for trucks

Aerodynamics is a major factor influencing the energy efficiency of HGVs.[20]

When driving a truck at constant speed on a flat level road, about 40% of the fuel consumed is used to overpower the air resistance (drag)[21]. The drag, which slows the truck down, is caused by high or low pressure at certain points in relation to the ambient atmospheric pressure. The oncoming airflow pushes against (1) the tractor front, creating a high-pressure region, just as it does on (2) the wheels and the front of (3) the semi-trailer. The heavy duty vehicle moving

[20] This is less the case for buses and coaches, since:
- unlike heavy goods vehicles, buses and coaches are not composed of several vehicles the spaces between which may cause aerodynamic perturbations;
- most of the bus and coach fleets operate in cities at speeds below 50 km/h, where aerodynamics do not play a crucial role; the number of coaches used in long-distance transport is small compared to the fleet of heavy goods vehicles used in inter-urban transport;
- it was stated by stakeholders during the consultations that the current legislation give manufacturers sufficient flexibility to conceive aerodynamic buses with drag coefficients as low as 0.35.

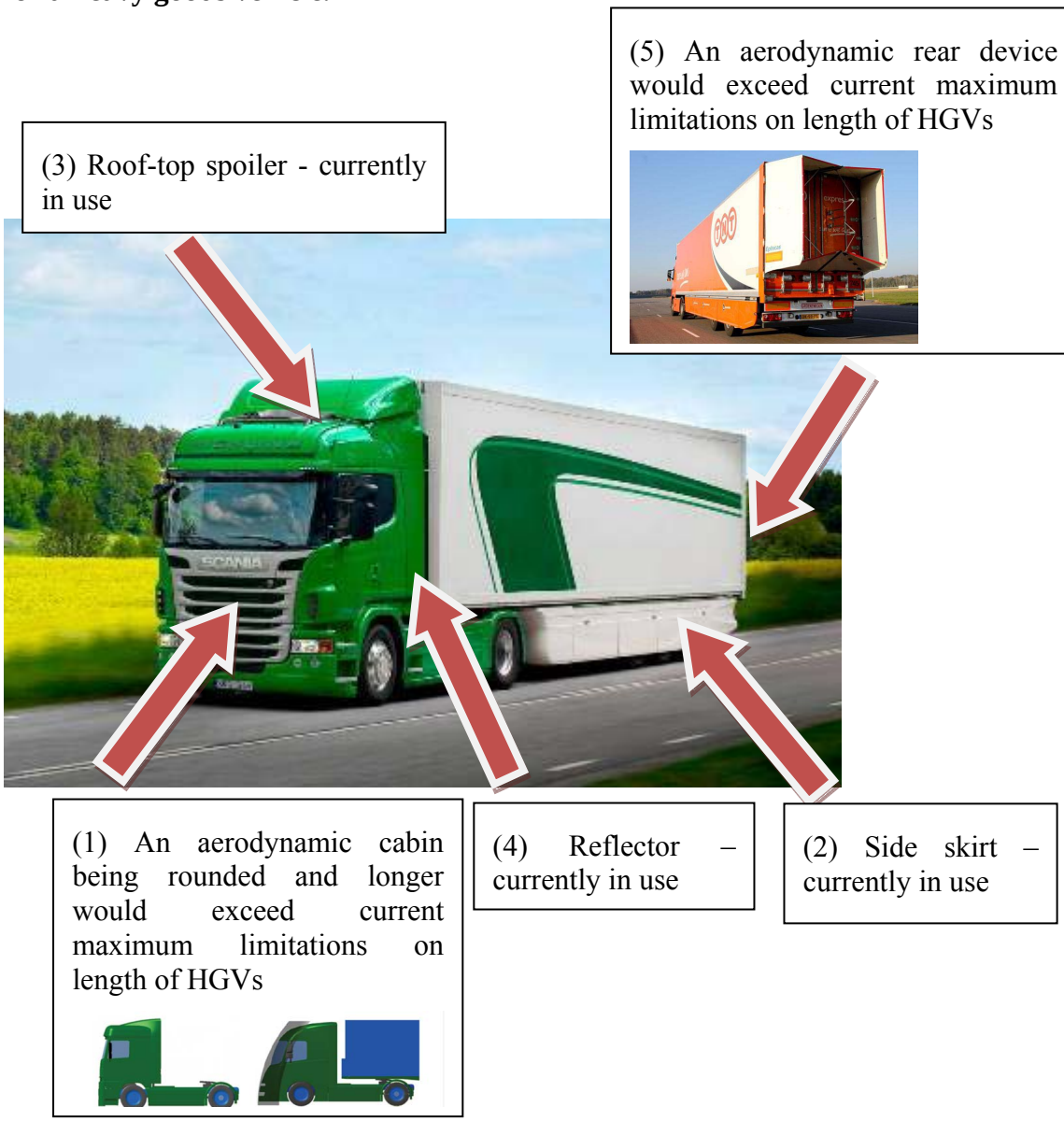
For the above reasons, the IA will concentrate on heavy goods vehicles in what follows.

[21] ITF: Innovation in Truck Technologies, 2010.

forward in the airflow creates a low-pressure region (4) behind the tractor and (5) the semi-trailer, which 'pulls' the vehicle backwards. Interestingly, the high-pressure region at the front contributes just as much to drag as the low-pressure region at the rear.

The sources of drag numbered (2), (3) and (4), representing one third of the total drag, are currently addressed by respectively side skirts, roof-top spoilers and reflectors between cabins and trailers, which can be installed on trucks as these devices do not extent weights or dimensions of vehicles beyond the maximum limitations of the Directive. Notably roof-top spoilers and reflectors are widely used on approximately 90% of all long-distance trucks[22]. Side skirts, on the other hand, are only used to a very limited degree, according to stakeholders, due to their exposure to damage when loading HGVs from the side.

Figure 1: Different aerodynamic devices which allow overcoming the aerodynamic drag for a heavy goods vehicle.



The main sources of drag numbered (1) and (5) above, representing each one third of the total drag, can only be addressed within the current limitations of dimensions of HGVs stipulated by Directive 96/53/EC by decreasing the length of loading units, which consequently would

[22] Source : IRU.

reduce loading capacity. Stakeholders argued during the public consultation that reducing loading capacities of HGVs[23] would compromise the commercial viability of such vehicles, and that the Directive currently hampers innovations of HGVs that could contribute to improving their energy efficiency and reducing their CO_2 emissions. As an illustration, accomodating aerodynamic devices at the front and at the back of HGVs (of for instance 2 metres) within current maximum dimensions of 18.75 m, would require a correponding decrase of loading capacity, and thus of revenues, by 18%[24]. Although aerodynamic devices at the front and at the back of HGVs would generate substantial fuel savings, as explained below, reducing overall costs by more than 18% by means of fuel savings alone – to compensate for the loss of revenues alone – would require a more than 60% improvement in fuel efficiency of HGVs[25], which could not be achieved by means of aerodynamic devices. On the other hand, allowing additional length of HGVs beyond current maximum dimensions would enable hauliers to maintain existing loading capacities and to benefit from fuel savings (see also cost-benefit analysis carried out in chapter 6.2).

As regards the drag source numbered (5), the frame table here below gives an idea of possible solutions to improve the energy efficiency of trucks by additional equipment on the trailer. Adding this equipment would exceed the maximum length allowed by the Directive. The potential CO_2 emissions reduction provided in the table have been confirmed by numerous studies and trials[26] carried out by the industry.

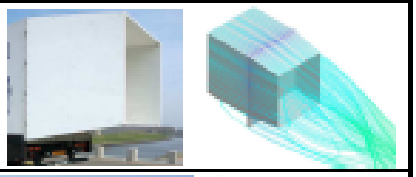
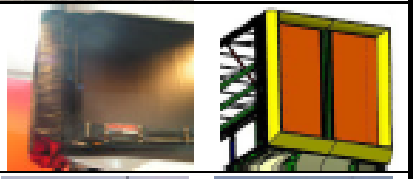
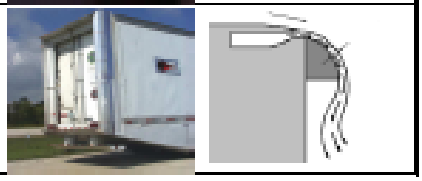
[23] Indeed, the current rectangular design of the trailers allows maximising the loading space in terms of number of pallets. A more aerodynamic design – within the same length, width and height limits – would inevitably reduce loading capacity.

[24] A 2-meter reduction of loading capacity represents a reduction of 6 pallets of a total of 33 pallets, i.e. 18%.

[25] Fuel costs represent 30% of total costs.

[26] See, for example, http://www.transportenvironment.org/publications/design-lorry-tractor-optimised-safety-and-fuel-consumption; http://www.internationaltransportforum.org/jtrc/DiscussionPapers/DP201010.pdf

Table 1: Devices to Reduce Aerodynamic Drag at the Rear of Trucks

Device	approx. additional dimension required	best suiting trailer type	approximate CO2 reduction long haul	Image / working principle
Open cavity tails	1.0 - 1.5 m	box, curtain, refridgerated box (reefer)	6%	
Inset open cavity tails	0.6 m - 0.8m	box, curtain, refridgerated box (reefer)	5-8%	
Inflatable open cavity tails	0.4 - 0.6 m	box, curtain, refridgerated box (reefer)	3-4%	
Inflatable closed cavity tails	1.0 - 1.5 m	box, curtain, refridgerated box (reefer), chassis	5%	
Active Flow Control / Difusors	0.3 m	box, curtain, refridgerated box (reefer)	7%	

Source: Towards a lower fuel consumption and CO_2 emissions by means of aerodynamic add-ons for trailer rear-end, PART Consortium[27]

As to the drag source numbered (1), studies have been performed on the front of the trucks, suggesting that much improved performances could also be achieved by a more aerodynamic shape of the vehicle, as for instance the one presented here below in Figure 2. The expected reduction of fuel consumption is 3-5 % (FKA report 104190 Aachen 2011). Figures must however be taken with care as they result from theoretical studies, and laboratory tests, not from real-life tests of trucks in operational conditions.

[27] *Towards a lower fuel consumption and CO2 emissions by means of aerodynamic add-ons for trailer rear-end*, PART - Platform for Aerodynamic Road Transport, 2011

Figure 2: Current design and example of 'Design of a Tractor for Optimised Safety and Fuel Consumption'

Source: FKA Report 104190, Aachen 2011.

Combining the devices presented in Table 1 and the change to the cabin presented in Figure 2, it would be possible to reduce the drag coefficient (cw) of today's trucks and tractor-semitrailer combinations, ranging from 0.5 up to 0.9, to at least 0.3. In real numbers, today's technology allows reducing the aerodynamic drag by 20 to 25%, resulting (according to scientific studies) in fuel savings of 7 to 15%[28]. However, such changes would necessitate a modification of the maximum dimensions specified in the Directive, or alternatively a reduction of the loading capacity by reducing the length of the trailers, a solution which, as earlier mentioned, would be economically unsustainable.

Additionally, the redesign of the cabin allows taking other problems mentioned by stakeholders into consideration, including an improvement of driver comfort and the safety of vulnerable road users. Currently, truck drivers are seated on top of the engine, which poses serious challenges in terms of cooling of the cabin and access to the engine. The size of the couchette is small, and the cabin is occupied by several mandatory devices. Changes to the cabin would moreover benefit citizens in terms of safety, as cabins with a more rounded front would reduce the impact and the number of victims in case of accidents. While fatalities involving HGVs in absolute numbers have halved over the last 10 years, the number of fatalities in accidents with HGVs is still around 4,000 per year or 11.4% of total road fatalities in the EU in 2009. As highlighted by several stakeholders, changes to the cabin design for a longer and more rounded front would allow reducing the number of fatalities in accidents with HGVs. Simulations have shown that rounded fronts would prevent overruns of persons hit by HGVs[29] and therefore reduce the number of fatalities. See section 5.3.2 of this document.

The implementation of new aerodynamic devices or designs must also take into account issues like signalisation, the lighting of vehicles at night and room for manoeuvre of the vehicles.

B. Certain maximum weight limitations prevent the market uptake of electric/hybrid vehicles

The introduction of hybrid or electric powertrains, mainly in urban or small-size trucks and buses (typically with a maximum total weight of 18 tonnes [30]) could additionally contribute to improving energy efficiency. However, batteries used in these propulsion systems continue to be very heavy, weighing around one tonne according to figures provided during the stakeholder consultation. One tonne less in terms of the payload would undermine the economic sustainability of many transport operations. As an illustration, reducing the payload

[28] ITF: Innovation in Truck Technologies, 2010.

[29] http://www.transportenvironment.org/sites/te/files/media/2012%2002%20FKA%20Smart%20Cab%20study_web.pdf.

[30] Heavier lorries and coaches are not currently deemed suited for such propulsion systems.

by 1 tonne for buses with a capacity of 30 passengers, weighing on average 75 kg (excluding luggage – see chapter 4.1.1), would reduce the capacity of buses by approximately 13 passengers, or some 40%. Consequently, the current weight limits of the Directive may hinder the market uptake of such vehicles and act as an obstacle to reap their environmental benefits in terms of energy efficiency.

C. Certain maximum weight limitations have not evolved to keep pace with the growing weight of vehicle safety and comfort equipment and of passengers

The total weight of vehicles, which is limited by Directive 96/53/EC, is determined by the weight of the vehicle as well as its payload. Technical developments of vehicles in relation to on-board safety equipment and cleaner powertrains have made vehicles heavier. It has been particularly striking in coaches where safety and comfort requirements are relatively higher. This has resulted in a decreasing capacity to load goods (lorries) or passengers (buses) (and hence the need for more HGVs / more buses to transport the same amount of goods and passengers respectively). The table below provides a non-exhaustive list of examples of items, which have made vehicles heavier:

Table 2: Examples of items which make vehicles heavier

Items	*Situation - mid-1990s (in kg)*	*Current situation (in kg)*	*Additional weight (in kg)*
Euro IV/V Engines	260	450	190
Noise reduction	15	100	85
Retarder and brake systems: ABS, ESP, ACC, AEBS, LDWS	70	220	150
Strength of the body (UN R 66)	110	200	90
Underrun protection (UN R 58)	0	60	60
Safety belts and anchorages	80	200	120
Air-conditionning system + Toilets + Water tank + Kitchen	315	480	165
Onboard equipment: Camera & Mirrors + Multimedia + ITS systems	30	70	40

At the same time, the standard weight of a European passenger has increased by 7 kg[31], and the weight and size of personal luggage has also gone up. Therefore, the number of passengers that a coach can carry has decreased, at constant size and weight, contributing to an increased price per passenger (the total cost of the trip has to be divided by fewer passengers), making transport by bus and coach less attractive, and thus contributing to a potential reverse shift from collective transport to personal vehicles. It could be necessary to accommodate these developments to make collective transport of passengers more efficient, in terms of energy, demand management and economic profitability for the operators.

The 2011 White Paper on transport similarly stressed the need for transporting 'greater numbers of travellers jointly to their destination by the most efficient (combination of) modes.'

[31] Research on the Weight of Buses and Touring Coaches – Final Report, NEA June 2007.

Root cause 2) Certain maximum weights and dimensions have not kept pace with the technical developments of intermodal transport and containerisation

The development of trade has gone hand in hand over the two last decades with the growing containerisation of global logistic chains. Containerisation presents a further opportunity for the development of intra-EU intermodal/combined transport as an alternative to door-to-door road transport solutions. However, the incomplete standardisation of the transport units hampers this development. As a result certain large containers used in maritime transport can hardly be accommodated in the land transport legs of the chain, because of the maximum dimensions imposed by the Directive.

This is the case of the 45' containers which are increasingly used as they carry more payload, and for example 2 pallets more (on the floor and more when stacked) than in traditional 40' containers.

45' containers represent 20 % of the global stock of containers[32], the number of which increased by 86% between 2000 and 2010 to 14.875 million TEU (Twenty Foot Equivalent Units)[33]. Today, some 20 % of these containers reach Europe. 45' containers thereby represent 2-3% of the total container market in Europe and this share is reportedly rapidly increasing. When arriving in EU ports, such containers are often transported by rail, in short sea shipping or on inland waterways towards the final destination, but the transport from the port to the connecting transport mode as well as the final part of the trip are usually performed by road.

45' containers have the potential of decreasing energy consumption and consequently to promote the efficiency and attractiveness of intermodal transport chains on routes which combine short sea shipping or rail transport with road transport. But 45' containers may currently only be transported by road under certain conditions[34], with a special permit or by way of derogation from Directive 96/53/EC, which needs to be notified to the Commission. Such permits and derogations entail administrative burdens which are costly for operators and which may hinder and slow down the development of intermodal transport. As an example, obtaining a special permit for transporting a 45' container from Hamburg (DE) to Aarhus (DK) by road costs € 90. As the application for the permit is complex, lengthy (at least 14 days) and has to be submitted in the language of the country in which the permit is requested, hauliers usually apply via specialised organisations charging a fee, which reportedly can amount to approximately € 70 (in DK), i.e. a total cost of € 160.

Moreover, the maximum weight of vehicles carrying 45' containers remains limited to 40 tonnes, unlike vehicles transporting 40' containers for which a maximum weight of 44 tonnes is allowed as part of a combined transport operation[35] to factor in the dead weight of the container. This discrepancy between 40' and 45' containers is due to the fact that Directive 96/53/EC was drafted at a time when 45' containers were only rarely used.

Other types of containers are arriving from overseas; 45' pallet wide (containers with a length of 45 feet but which are more than 5 cm wider than a standard 45' container. Thanks to this

[32] All figures in this paragraph come from different answers to the public consultation of stakeholders.

[33] Container supply review. May 2011. World Shipping Council.

[34] Commission Staff Working Document on the continuous carriage of 45' containers in national road transport, SEC (2006) 1581.

[35] In this report, combined transport is defined as the transport of goods between Member States where the initial or final part of the journey uses the road, and the other leg uses rail or inland waterway or maritime services for a distance of over 100 km. The road leg shall be less than 150 km if combined with a maritime leg. See also Council Directive 92/106/EEC of 7 December 1992 on the establishment of common rules for certain types of combined transport of goods between Member States; OJ L 368 of 17.12.1992, p. 38.

extra width these containers can carry two pallets side by side instead of one, i.e. 33 pallets in total instead of 27), 48' and 53'. Whereas these containers allow operators to carry more pallets, they would require more significant extensions of trailers in both width and length to be carried over road (as part of a standard operation).

- *Part 2: Ineffective application of the Directive*

An important problem highlighted by a group of stakeholders during the public consultation is the relatively large number of infringements related to weights of HGVs. The association Euro Control Route, which, out of 28,639 HGVs controlled in week 21 of 2012, found 6,800 HGVs with offences, of which 1,446 (21%) were overloaded. Other evidence has shown that during a roadside check on motorway A11 in France (March 2010), 1/3 of vehicles were overloaded, several vans by 1 tonne, a truck by 80 %, and a coach by 7 tonnes. This is consistent with reports from enforcers from other Member States, according to which 35% of the vehicles checked were non-compliant.

In cooperation with DG MOVE, Euro Control Route sent a separate questionnaire to its members asking about the most frequent infringements related to Directive 96/53/EC. The majority of the members pointed to an overweight of the driving axle. The poor compliance with, and hence the lack of effectiveness of Directive 96/53/EC, leads to damages to the infrastructure (especially road pavement and bridges) made by overloaded HGVs. ISWIM, the International Society on Weigh-In-Motion, estimates an additional average share of 3.8 %[36] of total maintenance costs (€ 25 billion – see chapter 5.2.1) caused by overloaded HGVs. In addition, road safety could be undermined by HGVs that do not respect authorised weights, since stopping a heavier vehicle requires a longer distance and collisions involving a heavier vehicle lead to more damage.

This poor compliance leads to distortion of competition between hauliers and negatively affects the internal market for road transport. In a context of fierce competition, operators operating at the edge of the rules by maximising their load can gain a substantial competitive advantage to the detriment of the others.

Levels of enforcement are very different between Member States. First of all, the limits authorized for national transport operations are quite different: from 40 to 48 tonnes in most countries, 50 tonnes in the Netherlands, 60 tonnes in some Nordic countries. In some countries, there is little enforcement in place. In many of the others, enforcement is done with portable static equipment, mainly during the day, not at night. There are only a few countries where checks are performed by well-trained staff in well-equipped sites along main roads or motorways. Weigh-in-motion stations (WIM) are essentially used in the following countries: NL – FR – DE – UK – CZ. CZ is the sole country where a law authorizes the use of WIM stations for direct enforcement, whereas in others WIM stations are only allowed for filtering, due to their level of inaccuracy.

Furthermore, levels of penalties vary between Member States, as well as thresholds above which these penalties are applied.For example, the threshold of overweight for immobilization of the vehicle varies from 6 % to 15 % between Member States.

Root cause 3) Lack of common and dissuasive enforcement methods

One of the main reasons for the poor compliance with the Directive is that controls are too infrequent, leaving an impression of impunity for potential offenders. According to estimates

[36] Average of range provided on chapter 5.2.1

in France, trucks are weighed on roadside stations on average every 2 million kilometres. Moreover, in the case of container transport, the wrong actors are fined: while drivers have no means to control the weight of the containers they transport, they are the ones responsible according to the law. On the contrary, legislation does not foresee the possibility of fining the shippers/forwarders, who have the possibility to estimate or measure the weight of the cargo and therefore to prevent overloading.

Furthermore, the enforcement policies and control practices in Member States using simple risk profiling are lacking effectiveness, considering that 1 out of 2 controls affect vehicles which comply with the rules, and is thus unnecessary,[37] and consuming scarce resources of public authorities, which could be employed more efficiently to obtain a higher dissuasive effect. Without considering the level of sanctions, which is another crucial element, current checks, when done, are often not cost-efficient and lack effectiveness.

It has to be noted that Directive 96/53/EC does not contain any provisions on the enforcement of the rules it has put in place. This has led the Member States to develop their own practices resulting in widely differing methods of checks and different categorisation and tolerances of offences.

As regards methods, checks performed by Member States vary from a purely manual selection of vehicles to be checked to the pre-selection using technical methods to filter vehicles to be checked manually. Modern and efficient methods, allowing targeted checks, are not widespread: for instance, Weigh in Motion (WIM) systems, which allow pre-checks to be carried out without physically stopping all HGVs and thus stopping only those with a very high likelihood of committing an infringement, are used by enforcement officers in a limited number of Member States only.[38]

On-board weighing devices are another option offered by technology to make drivers aware of the weight of their vehicles. These alert hauliers immediately when an overweight load is being loaded onto the truck. These equipment are currently not standardized, costly (around 3,000 €) and consequently not well deployed. In certain cases, without such devices and when an overweight container[39] is loaded onto a truck, hauliers have no way of checking whether they comply with maximum weight limits. However, there is no common legal framework requiring the use of these devices, and the lack of effective control policy by the Member States has not incentivized hauliers to equip their vehicle fleets.

As regards categorisation and tolerances of infringements, Member States deviate with respect to levels applied when checking HGVs. The result of the questionnaire prepared by Euro Control Route and DG MOVE showed that some Member States allow a tolerance of up to 5% whereas other Member States only allow a tolerance of 2%.

Those differing national enforcement practices is a source of confusion and contradictory signals to hauliers who are subject to different checks and sanctions throughout the EU. Furthermore, drivers have to face the risks of situations coming from the divergence in procedures, documents of proofs required, causing them delays, loss of time, and extra costs.

As a conclusion, current enforcement by Member States is insufficient, not cost effective and lacks harmonisation. As a consequence, hauliers frequently infringe the Directive, which

[37] See chapter 5.2.1

[38] It can be grossly estimated, that ca. 350-500 pieces of WIM equipment would be needed to ensure basic coverage of the main interurban network in the EU. So far, only 150-200 WIMs are deployed in the EU. (source: International Society on Weigh-In-Motion – ISWIM)

[39] Relative to the weight indicated on the accompanying freight documents.

leads to a distortion of competition between transport undertakings, to damage of infrastructure and to safety hasards.

Other problems, which could have been addressed by the revision process, have not been covered, either because these problems are not of a legislative nature but a technical one (for instance the fragility of the side skirts), or because they reflected positions expressed by some stakeholders which were not supported by a majority of them.

- **Who is affected, in what ways, and to what extent?**

On average, fuel consumption amounts to 1/3 of the costs of road haulage. The provisions of the current Directive, which effectively prevent a more aerodynamic design of the vehicles under the commercial constraints of maximising load capacity, therefore negatively affect commercial road operators. It is obvious that they equally strongly reduce the market opportunities of the manufacturers of such innovative aerodynamic devices and aerodynamic trucks.

Road operators and combined/intermodal transport operators are currently restricted in their capacity to transport larger containers. They would benefit – in terms of new commercial opportunities – from a change in the legislation which would allow them to fit maritime containers on semi-trailers and optimising the use of their transport means with smarter combinations of containers and swap bodies. All intermodal transport operators, including road, rail, sea and inland waterway operators, would benefit from the greater choice and flexibility introduced by these changes.

Truck drivers would be positively affected by changes to the cabin, which would allow for more comfort compared to the current cabins, which are designed to take up as little space as possible to allow for maximum loading space. Other road users would be positively affected by the reduction of the dead vision angles reducing the number of wounded vulnerable users during manoeuvers. Citizens will be positively affected by lower emissions of CO_2, NO_x, fine particulates and other pollutants, although a possible rebound effect (more road transport resulting from lower costs) will need to be assessed.

Public authorities will be affected as they are in charge of the enforcement of the Directive. They will benefit from reduced damages to road infrastructure and consequently reduced maintenance costs. Infrastructure adaptions will not be required beyond adaptions already introduced in Member States where longer vehicles are already allowed to circulate. Similarly, aerodynamic devices, which could also increase the total length of vehicles, would only be fully effective at speeds above 50 km/h and they would be intended to be folded when entering urban areas, when loading or when the vehicle is involved in an intermodal operation (loading the semi-trailer on to a rail wagon or the whole vehicle on to a boat).

Fuel savings may mean reduced fuel tax revenues but also a positive impact on fuel security and the EU's external trade balance.

FunFinally, all economic actors (companies and consumers) will benefit from lower transport costs and more efficient combined and intermodal transport.

The issue of control of the weights and dimensions of the vehicle will impact the police officers in charge, providing them assistance on procedures and technical means. It would affect the haulage industry by securing a level playing field and all citizens as overloaded vehicles induce higher risks during collisions and have a negative impact on the wear and tear of roads.

- **How would the problem evolve, all other things being equal?**

The economic crisis will, together with rising costs of fuel and increasingly stringent measures to reduce CO_2 emissions from transport, intensify the already fierce competition between hauliers in the road transport sector. This expected development is likely to increase the demand for fuel efficient vehicles by users and consequently to intensify R&D efforts by manufacturers to supply such vehicles. According to the PRIMES-TREMOVE baseline, the total average energy efficiency of HDVs is expected to improve from 309 to 271 tonnes of fuel (all types included) per mio vehicle-kilometres (vkm).

CO_2 emissions from HGVs represented approximately a third of total CO_2 emissions from transport in 2010 in the EU. This share is likely to increase as measures to reduce the emissions from other transport means have recently been introduced (e.g. emissions from new cars, ETS in aviation). In absolute terms, CO_2 emissions from trucks amount to 270 million tonnes per year. Despite the current economic crisis, the amount of vkm of HGV in Europe is rising and expected to increase from 314 mio vkm in 2010 to 390 mio vkm on 2030. If nothing is done, total fuel consumption of HGVs will increase, despite expected energy efficiency improvements, by 9% between 2010 and 2030 according to the PRIMES-TREMOVE baseline, resulting in increased air pollution and CO_2 emissions.

Truck manufacturers and equipment suppliers are working on several fronts to improve the energy efficiency of HGVs, for instance through more efficient engines. However, as mentioned by the manufacturers in the targeted stakeholder meeting organised by DG MOVE in the context of this IA, the current limits of Directive 96/53/EC prevent manufacturers from improving the aerodynamic performance of HGVs.

The upcoming Commission Regulation on the type approval of heavy duty vehicles will allow rear devices of a maximum length of 50 cm which could help saving 2 % of the fuel consumption (see Figure 3). This limited extension, would not require a revision of Directive 96/53/EC. Indeed the measurements in Directive 96/53/EC refer to Directive 97/27/EC (and as a result to the Commission Regulation which will repeal Directive 97/27/EC). Since rear deflectors are accepted in addition to the maximum measurements in the Regulation, they will not be considered as exceeding the maximum dimensions in Directive 96/53/EC either. However, the fuel savings would remain limited in light of the potential offered by longer extensions (see table 1 above).

Figure 3: 500 mm deflector under test

The small scale of the changes brought by this future Commission Regulation can result in a loss of competitiveness of the EU HDV manufacturing sector on markets in other world regions where developments are on-going to reduce the aerodynamic drag of HDVs[40].

The use of intermodal transport, which is generally acknowledged having the potential to increase energy efficiency and CO_2 performance of transport, is hampered by the Directive in terms of the use of 45' containers requiring special permits for transport by road. Due to the remaining additional administrative burden for 45' containers, as described earlier the EU risks staying behind the worldwide evolution of containerisation, and the additional costs of special permits and derogations will hinder the economic sustainability of an economic sector under considerable stress.

The use of 45' containers in land-only movements is unattractive for hauliers as – compared to conventional trailers – such containers are very heavy and thus reduce the permissible payload while allowing loading the same number of pallets as in conventional trailers and

[40] The United States '21st Century Truck Partnership' aims at an aggressive target of 20% reduction in aerodynamic drag by designing and deploying boat tailings, collapsible roof lines, side and underbody skirts, tractor trailer interfaces, and deflectors (see OECD/ITF (2010): Innovation in Truck Technologies – Discussion Paper 2010-10, p. 6).

while requiring costly permits for such movements. Hence, the use of 45' containers in land-only movements is not expected to increase in the future.

The use of hybrid or electric vehicles in freight transport is currently hampered – in addition to their price – by the additional dead weight of these vehicles and thus the need to reduce the payload of the vehicles, either passengers or goods, in order not to exceed the maximum allowed weight. This situation, unless unchanged, contributes to a slower uptake of hybrid and electric vehicles for freight transport, which will prevent the sector from becoming more energy efficient. The dead weight of HGVs seen in isolation is expected to increase in the future due to more stringent requirements related to safety and other equipment. Whereas this will reduce the permissible payload, the fierce competition between hauliers will require a greater consolidation with the risk of infringing weight limitations.

Moreover, both increasing mandatory safety requirements in HDVs and the general increase in the weight of human beings negatively impact the permissible payload and hence freight rates/ticket prices of the road freight and passenger transport sector respectively. Assuming that this situation would not impact traffic volumes, or only to a minor degree, passengers may increasingly choose to disfavour buses and coaches and use private cars, and more trucks will be needed to meet the transport demand for goods leading to higher CO_2 and pollutant emissions.

Leaving cabin designs of HGVs unchanged would also result in a missed opportunity to simultaneously reduce aerodynamic drag and to further reduce numbers of fatalities with HGVs.

In terms of compliance with current legislation on weights and dimensions, it is expected that the fierce competition in the EU road haulage market will intensify with the crisis and with increasing fuel costs. Hauliers are likely to operate more and more on the margins of the existing legislation, hence committing more infringements than currently reported. Current controls and methods applied by enforcement bodies are obviously not able to effectively ensure full compliance with the Directive. This situation is expected to increasingly result in distortion of competition between hauliers, and non-respect of maximum weight limits will result in damages of the infrastructure and reduced road safety.

- **Does the EU have the right to act – Treaty base, 'necessity test' (subsidiarity) and fundamental rights limits?**
  - *Link to the corresponding article of the Treaty*

This impact assessment explores and analyses options for revising Directive 96/53/EC, which is based on Article 91 TFEU (ex-Art 71). The EU added value was recognized when this Directive was adopted and the arguments, which substantiate this added value, still hold.

These arguments are predicated upon the ever-increasing reality that road transport within the EU is transnational in nature. Cross-border road freight transport accounts for approximately one third of total road freight transport[41] and passenger road transport also has an important international dimension. Data compiled by the European Commission shows that cross-border road freight is an increasing proportion of this total. This is due to increasing cross-border trade and economic growth, which have in part been facilitated by the EU Internal Market and by the liberalisation of the road freight market in Europe.

[41] Source: Eurostat, as compiled in the 2010 Road Freight Transport Vademecum (http://ec.europa.eu/transport/road/doc/2010-road-freight-vademecum.pdf)

- *Subsidiarity test*

The objective of Directive 96/53/EC is to set limits to the size of the vehicles allowed on public roads in the EU, safeguarding the right for each Member State to accommodate bigger or heavier vehicles on its own territory if its infrastructure allows it. The objective of the current revision does not question the possibility for Member States to develop solutions according to local circumstances. It also aims to adapt the terms of the Directive to technical progress, within the existing constraints of infrastructure, road safety and market conditions. Indeed it appears that some limits in the Directive could be relaxed to harness the benefits from new technologies. An adaptable approach to the definition of new standards is suggested so as to reflect techincal evolutions and changing market standards.

As at the time when Directive 96/53/EC was adopted, an action by Member States alone would not be sufficient to ensure an EU-wide harmonisation of maximum lengths and dimensions. A patchwork of differing national rules would hinder the creation of a truly integrated EU road haulage market.

In a context of increasing cross-border road freight transport, the preceding chapters have highlighted the fact that common rules and levels of enforcement are increasingly required to ensure a level playing field between hauliers. Different levels of enforcement between EU Member States favour certain hauliers and may create incentives for hauliers to plan routes via countries or itineraries where enforcement levels are the lowest. These different levels are also causes for discrimination between hauliers and additional burdens in international traffic. Action at EU level is therefore required to harmonise effectively the implementation of the limits set in the Directive.

However, given that enforcement is subject to important subsidiarity considerations, as measures in this area may be costly and as they are under the competence of Member States, any measure proposed in this area will be studied carefully in the section on assessment of impacts. Similarly, categories and levels of sanctions, which are outside the scope of the existing Directive and which are under the competence of Member States, will be scrutinised and will be assessed in terms of added value before any proposal is recommended in this area.

- *Test of added value*

Considering the nature of the problems addressed in this IA having a clear EU dimension – both in terms of harmonisation and in terms of controls – the EU is in a better position to address the problems than Member States. Lastly, EU Directives may only be revised at EU level.

- **OBJECTIVES**

This section defines the general, specific and operational policy objectives of the proposed initiative, discusses possible trade-offs between them and verifies their consistency with other EU horizontal objectives.

o Policy objectives

General objectives

In line with the problems described in section 2 above, the general objective of this initiative, taking account of the general economic context and the headline goal of the White Paper, is twofold:

- To improve the energy efficiency of road transport and to facilitate intermodal transport while respecting the requirements of infrastructure maintenance, road safety and the protection of the environment. [42]
- To improve the internal market for road transport by ensuring a level playing field for hauliers and by increasing the effectiveness of Directive 96/53/EC.

Specific objectives

In light of the above and in order to address the problem and its root causes identified earlier, the general objective of this initiative can be translated into three specific objectives (SO). These objectives must be achieved without upsetting the balance between the requirements of infrastructure maintenance, road safety and the protection of the environment, as explained under the first general objective and in section 2.2.1 above.

SO1: To enable the market uptake of more aerodynamic, electric and hybrid trucks and to increase the attractiveness of certain coach services.

SO2: To enhance the development of intermodal/combined transport via a support to new possibilities of containerisation.

SO3: To ensure better enforcement of the maximum weights and dimensions across the EU.

Table 3: Mapping problem and objectives

Problem – Part 1	**General objective – Part 1**
Certain limits on weights and dimensions set by the Directive constitute obstacles to energy efficiency gains of road vehicles and to intermodal transport operations.	**To facilitate energy efficiency of road transport and intermodal transport by revising certain limits on weights and dimensions of vehicles while maintaining the balance with the requirements of infrastructure maintenance, road safety and the protection of the environment.**
Root cause 1: Certain maximum weights and dimensions prevent the market uptake of more aerodynamic, electric and hybrid trucks and reduce the attractiveness of certain coach services.	*Specific Objective 1:* To enable the market uptake of more aerodynamic, electric, hybrid trucks and to increase the attractiveness of certain coach services.

[42] As mentioned in recital 5 of the Directive.

Root cause 2: Certain maximum weights and dimensions have not kept pace with the technical developments of intermodal transport and containerisation.	*Specific Objective 2:* To enhance the development of intermodal/combined transport
Problem – Part 2 **The Directive is not applied in an effective manner**	**General objective - Part 2** **To improve the internal market for road transport by providing for a fairer playing field for hauliers.**
Root cause 3: Lack of common and dissuasive enforcement methods	*Specific Objective 3:* To ensure better enforcement of the maximum weights and dimensions across the EU

Operational objectives

The above-mentioned specific objectives related to energy efficiency (SO1 and SO2) of road and of intermodal transport are complex and depend on factors which are independent from the scope of this initiative. Due to complications of dissociating these factors, it has been decided not to propose any quantified operational objectives with regard to energy efficiency. Alternatively, the following operational objectives are proposed, which will allow monitoring and evaluation (see Chapter 7) of the impacts, and their evolution, of the proposal of the Commission:

OO1: Achieve a significant share of long-distance trailers equipped with rear aerodynamic devices (75%) and aerodynamic cabins (50%) by 2030

OO2: Achieve a doubling of the use of 45' containers transported as part of a combined/intermodal transport operation by 2030

SO3 logically should be associated with an operational objective measuring the evolution of the compliance with Directive 96/53/EC. The following operational objective is proposed:

OO3: Increase the effectiveness of manual checks (number of infringements / number of checks). Such an increase will improve the reliability of checks and at the same time avoid 100,000 unnecessary checks annually by 2020.

- **Possible trade-offs between the objectives of this initiative and the horizontal objectives of the EU**

Increasing the energy efficiency of road and of intermodal transport will increase economic efficiency of these modes of transport, which could potentially lead to a minor rebound effect resulting in freight and passenger transport shifting to road from other modes of transport and thereby contributing to increased CO_2 emissions. However, as mentioned in Chapter 2, and also in the 2011 transport White Paper, this initiative would not stand alone. Other initiatives are planned, which increasingly will implement the 'user-pays' and the 'polluter-pays' principles, and which will complement this initiative with the goal of ensuring competitive transport services, while at the same time seeking to avoid rebound effects. For example, the 2011 White Paper on Transport announces the introduction of an infrastructure charging scheme for heavy duty vehicles, with a common tariff structure and cost components such as

the recovery of wear and tear, noise and local pollution costs, which would replace the existing user charges.

- **POLICY OPTIONS**

The stakeholder consultation, the targeted stakeholder meetings and research allowed the Commission to identify a set of individual measures having the potential to address the root causes identified in the problem definition above. The following process was applied for establishing the policy packages that will be analysed in later parts of the present report:

Identify the policy measures which can be discarded on the basis of a first preliminary assessment;

Identify a list of retained policy measures addressing the problems and respective root causes in full;

Combine retained measures into policy packages constituting viable policy alternatives for achieving the objectives.

- **Discarded policy measures**

A few policy measures were proposed by some stakeholders, yet contested by other stakeholders and in some cases contradicted by scientific evidence. They are described in more detail below along with reasons for excluding them from further assessment in this IA.

Firstly, several proposals were made in the public consultation to increase the loading capacity of vehicles in cross-border traffic (for instance to liberalize the traffic of EMS vehicles at 60 tonnes and 25.25 m, or to raise the weight limit for five- or six-axle vehicles to 44 tonnes). Such proposals were based on studies having been carried out on the potential of vehicles to increase the efficiency of road transport by increasing the loading capacity. However, discussions and objections from several other stakeholders, and the fact that the underlying studies present conflicting results, do not allow establishing a mature and clear position on the long-term impact of an EU-wide use of such vehicles, notably as regards possible infrastructure damages or expansion/investment needs, road safety, rebound effects and modal shift. Moreover, maximum dimensions of vehicles and lengths of loading units – and thus the loading capacity of vehicles – are directly related. As standard loading units are essential to ensure interoperability in and between transport modes, any extension proposed by stakeholders to increase loading capacity would hinder interoperability and consequently not be considered as a valid policy measure. Therefore, and as it was initially announced in the introduction to the public consultation, all measures beyond what is currently authorised by Directive 96/53/EC[43] intending to significantly increase the total weight and the loading capacity of long-distance HGVs are out of the scope of this initiative and will not be considered in this impact assessment.

Secondly, some proposals were made by niche sectors to accommodate specific needs. For instance, transporters of completed vehicles and of refrigerated goods suggested that an increase in the maximum loading length and/or width may be beneficial to accommodate their specific loading conditions. Given the limited market share of these sectors and given potential needs of other niche markets, which were not expressed during the consultation and which would be overlooked, it was decided not to provide specific derogations for each of these as it would lead to a fragmentation of legislation on a sectorial basis. Moreover, some of the sectorial requests – if satisfied – would lead to a significant increase of the loading capacity, an option excluded from the scope of this revision of the Directive as explained in point 2.2.1 above.

[43] Including the interpretation of certain aspects of Directive 96/53/EC – see the letter from Vice-President Siim Kallas to MEP Brian Simpson: http://ec.europa.eu/transport/modes/road/doc/2012-06-13-kallas-reply-to-simpson.pdf

List of considered policy measures

The tables below provides a mapping between the retained list of policy measures proposed by stakeholders, Member States and other interested parties, and the root causes identified ealier in this Impact Assessment.

- *List of considered policy measures in relation with energy efficiency*

Table 4: Measures corresponding to root cause 1: Certain maximum weights and dimensions prevent the market uptake of more aerodynamic, electric and hybrid trucks and reduce the attractiveness of certain coach services.

Measures	*Description*
1. Rear flaps	The maximal allowed length is increased for vehicles equipped with special aerodynamic devices fitted at the rear of the trailer/semi-trailer. The devices must respect essential requirements on aerodynamics, road safety and suitability for the infrastructure. They must be foldable or retractable in order to allow urban traffic, loading onto rail wagons, and to accommodate the constraints of the infrastructure on and off motorways. These allowances shall be used for no other purpose than aerodynamics and cannot increase the loading capacity.
2. Aerodynamic cabins	The maximum allowed length of HGVs with more aerodynamic cabins is increased. The conditions, including the essential requirements for the devices on energy efficiency, CO_2 emissions and road safety and suitability for the infrastructure are defined by the Commission with the help of a committee. The extended length will allow manufacturers to redesign the cabin to improve its aerodynamics, to improve the safety of other road users and the comfort of the driver. As above, these permissions are used for no other purpose than aerodynamics and cannot increase the loading capacity of HGVs.
3. Make rear flaps mandatory on all vehicles	This measure concerns all new vehicles as well as retrofitting of existing ones by 2025. This date is fixed to give sufficient time to hauliers to adapt or renew their fleets of trailers.[44]
4. Higher weight limits for electric/hybrid trucks	The maximum weight of vehicles using electric or hybrid propulsion is increased by 1 tonne for the sole purpose of accommodating the extra weight of the batteries for electric or dual propulsion (hybrid motorization), and with the condition that current maximum axle weight limits are respected[45].
5. Max. 19 t for two-axle coaches	The maximum weight of two-axle coaches is increased from 18 t to 19 t to accommodate the extra weight of the new mandatory on-board devices for safety and control, and to take into consideration the increase in weight of passengers and luggage[46]. The increase in the weight of vehicles due to legal obligations is detailed above (see chapter 2.2.1)..

[44] An alternative to the measure could have been to limit the obligation to new vehicles and to avoid retrofitting existing vehicles. The positive and negative impacts of the measure, as presented here under would be typically the same, with a different range of magnitude due to the lower number of vehicles concerned in the first years. This is why the two measures are grouped in one.

[45] The axle load is more critical to road damage than total vehicle weight, as the pressure on the infrastructure is provided by the axles. As such, a vehicle with a higher number of axles carrying a given weight will cause less damage to the infrastructure than a vehicle with a lower number of axles.

[46] On average, weights of 'standard' passengers have increased since 1996 from 68 kg to 75 kg

Table 5: Measures corresponding to root cause 2: Certain maximum weights and dimensions have not kept pace with the technical developments of intermodal transport and containerisation

Measures	*Description*
6. Allow for 45' containers in combined transport	Extension in length of the trailers by 15 cm to accommodate 45' containers in combined transport, and only for that purpose. In addition, as the cross-border transport of 40' containers is already allowed with a weight of 44 tonnes to account for the dead weight of the container, transport of 45' containers is also permitted to reach 44 tonnes in combined transport. Furthermore, the transport of non-ISO 40' containers is also allowed in combined transport.
7. Allow for 45' containers in intermodal transport[47]	The transport of 45' containers is allowed in intermodal transport and by standard trailers only extended by 15 cm, with a weight of 44 tonnes. No more reference to combined transport is made.
8. Facilitations for larger containers	The future tendency seems to be going towards expanded sizes of containers in intercontinental shipping to 48 or even 53 feet. It is proposed that the Commission is empowered to update the limitations in dimensions and weight fixed in Annex I to the Directive in order to accommodate the evolution of intermodal transport of containers. This includes also pallet-wide 45 feet containers. Such an update would be based on a market study, expert consultation and an impact assessment.

- *List of considered policy measures in relation with improving the functioning of the internal market for road transport*

Table 6: Measures corresponding to root cause 3: Lack of common and dissuasive enforcement methods

Measures	*Description*
9. Guidelines on enforcement	The Commission will define guidelines on good practices for controls and checks with the help of a committee and experts from stakeholder organisations. These guidelines will address methods and best practices to make checks more efficient (ways to target vehicles and to perform checks efficiently and safely), with a view of harmonization between all Member States. The work will be based on the results of European projects, the experience gained in different Member States and from the operation of weigh-in-motion stations and of other automatic systems.
10. Common categorisation of infringement	Binding categorisation of the levels of seriousness of infringements to the Directive, with a regular reporting obligation to the Commission for Member States on checks carried out and infringements. Reports will be used to monitor the effectiveness of the enforcement policy of the EU and the Member States. The synthesis of the reports will be published. The categorization of infringements will be defined according to different thresholds on excessive weight, length or width of the vehicle. Depending on the category, vehicles could/shall be stopped until obtention of a special permit or unloading, a financial penalty would be imposed or even – for the highest infringement class – the

[47] In distinction from combined transport, defined earlier in this IA, intermodal transport has to involve at least two modes of transport, but no restrictions are imposed with regard to the length of the road leg, the rail leg or the waterborne leg. In combined transport, the road leg is limited to 150 km. The difference between measures 6 and 7 is on this parameter.

	procedure for loss of good repute of the company would be launched.
11. Mandatory preselection of vehicles targeted for manual checks	In order to limit the number of vehicles stopped for manual control, and to increase the number of vehicles controlled by automatic means, all Member States should implement filtering methods for checks on weights and dimensions enabling a pre-selection. Preselection of vehicles could be carried out with weigh-in-motion stations or on-board weighing sensors linked to the digital tachograph, or with company profiling. The preselected vehicles would be stopped for manual check and only this manual check would possibly lead to an infringement and a prosecution. The obligation will be defined in terms of performance and not in terms of means.
12. Co-liability of the shipper / forwarder	Road transport operators transporting containers often have to rely on the weight stated on the freight documents to ensure compliance with the maximum permissible weight. In cases where HGVs are overweight due to inaccurate weight specifications on the documents, and in cases where the transport operators had no other means of verifying the total weight, shippers, freight forwarders or other parties having indicated the weight of the containers on the freight documents and having signed these shall be jointly liable in case of infringements.
13. Standards for on-board weighing devices	The Commission will define EU standards of on-board weighing devices in order to ensure pan-European interoperability so that the devices can communicate with roadside equipment. It will facilitate the deployment of on-board weighing devices, which would transmit in real time data from a vehicle to a police officer alongside the road through a DSRC interface and beacon. This would allow police forces to know the weight of the vehicle without stopping it. It would also allow hauliers to know the weight of their truck more precisely when loading.
14. Compulsory on-board weighing devices	On-board weighing devices will have to be installed by default for all new trucks and coaches as from 2025. Retrofitting of older vehicles will not be mandatory.
15. Minimum number of manual checks	All Member States shall mandatorily check a certain percentage, e.g. 10%, of the number of trucks and coaches on their road network for offenses to the rules on maximum weights and dimensions.

- **Identification of the policy packages (in addition to the business-as-usual scenario)**

To address the problem and all the problem root causes in full, and given the substantial list of measures, it is proposed to form policy packages (PP) of measures for further assessment. Each policy package will be composed of a series of policy measures addressing both the issue of energy efficiency and the issue of enhancing the rules governing the functioning of the internal market.

It is proposed to keep for in-depth assessment three PPs, which are cumulative, meaning that PP 2 would include the measures of PP 1, and PP 3 would include the measures of PP 1 and of PP 2. The policy packages are conceived to include measures with increasing intensity addressing respectively energy efficiency and compliance with the rules of the Directive. The amplitude of impacts, both negative and positive, is expected to be higher in PP 2 than in PP 1, and higher in PP 3 than in PP 2.

Other policy packages with measures of varying intensities were also provisionally envisaged combining measures with high intensity in the area of energy efficiency with measures of low intensity in the field of enforcement. Such policy packages were however discarded as measures to increase the maximum length and weight of vehicles would require proportionately reinforced control measures in order to avoid additional infringements, which may have adverse impacts on safety and on the infrastructure. On the other hand, policy packages envisaging measures of low intensity in the area of energy efficiency and measures of high intensity in the area of enforcement were discarded for reasons of political

acceptability, acknowledging that higher levels of enforcement without preselection, in a situation where current limitations of weight and dimensions of HGVs would remain unchanged, may be considered as a significant burden to stakeholders and to Member States and such policy packages would have little chances of being adopted[48].

▪ *Policy Package 1: Limited revision*

This package is based on limited revisions of the Directive as well as on soft measures aiming at an improved implementation of the Directive with minimal changes and costs. It therefore excludes measures which:

- require changes at the vehicle manufacturing phase (measure 2),
- lead to a serious re-organisation of the logistics structures and procedures (measures 8, 12 and 13),
- priviledge compulsory over optional changes (measures 3, 10, 11, 14 and 15),
- are general, rather than limited in application (measure 7).

In order to improve the energy efficiency of trailers and so as to reduce their CO_2 emissions, the Directive needs to be amended to improve the aerodynamic performance of vehicles. Studies performed by different stakeholders and presented during the stakeholder meetings as references suggest that an extension of the length of the vehicle is necessary in order to accommodate foldable or retractable rear flaps. These flaps would primarily be used when the truck exceeds 50 km/h and should thus be retractable or foldable when entering urban areas, slow roads with roundabouts for instance, or for use on rail wagons or ships in combined transport. These flaps would be allowed if they comply with technical requirements on aerodynamic performance, on traffic safety and suitability for the geometry of the different types of road or streets. A committee will help the Commission to refine and to update these requirements on a regular basis. The measure would be immediately operational, given that manufacturers of trailers indicated that they would be in a position to react very rapidly.

A second way to improve the energy efficiency and environmental performance of trucks and coaches is to provide the possibility to better accommodate alternative propulsion systems in these vehicles. Therefore, derogations in weight are provided for alternative systems – electric or hybrid – for both trucks and buses. Studies on batteries and hybrid motorisation suggest that an increase of 1 tonne is needed to the weight limits for trucks and coaches.

Energy efficiency also entails a shift from personal transport to public transport. It is therefore important to take into account the current evolution of the weight of passengers and their luggage and to adapt the maximum weight of a coach for that purpose. A weight increase of 1 tonne will be proposed for two-axle coaches.[49] This extra weight will also accommodate the different types of equipment made mandatory for the purpose of, for instance, passengers' safety and comfort, as explained in chapter 2.2.1 above.

In order to accommodate the development of intermodal transport and of containerisation, and drawing on the stakeholder consultation and workshops, it is proposed to allow an additional

[48] Higher levels of enforcement without preselection would require for instance an increase in the number of police forces devoted to this task by the Member States, an increase the number of vehicles stopped on the highways, thus an increase the number of parking places used for control, and would mean a higher loss of time (and an increase of costs) for drivers and haulage companies.

[49] This increase has been suggested by the stakeholders. It strikes the balance between the need, on the one hand, to reflect the increase in the weight of safety and environmental equipment (see table above) as well as of passengers and their luggage and, on the other hand, to respect the 11.5 t weight per axle standard to which main roads are built.

15 cm extension of the length of the trailer for the transport of 45' containers. This is a very limited modification and it would have virtually no impact on manoeuvrability or safety. Considering that vehicles carrying containers of 40' as part of a combined transport operation may currently be loaded up to 44 tonnes without a special permit so as to take into account the dead weight of the container and to give an advantage to intermodal transport, the same derogation should for reasons of consistency apply to vehicles carrying 45' containers. Measures 6, related to combined transport, and 7, related to intermodal transport, are both retained in PP1 as alternative solutions for facilitating the transport of 45' containers. They were both suggested during the stakeholder consultation and, given their similar nature, it seems appropriate to analyse these measures as variants of the same policy package rather than as parts of different policy packages. Policy Package 1 thus offers two variants regarding measures 6 and 7 on respectively combined and intermodal transport of 45' containers:

- In variant "a", the facilitations for the transport of 45' containers at 44 tonnes would remain restricted to the area of combined transport, like in PP1 (measure 6)
- Variant "b", on the other hand, proposes to extend the possibility to transport 45' containers at 44 tonnes beyond the scope of combined transport (measure 7), and enable these to be part of intermodal transport chains as well, in order to further promote containerisation.

Moreover, under this package an improved enforcement of infringements against the Directive would be addressed through guidelines drawing the attention of all stakeholders including Member States' authorities to the requirements of the Directive, especially on the maximum weight, and providing some rules and procedures, as well as technical means on how to use them. These guidelines, strongly welcomed by the enforcement community, would harmonise the procedures across the EU, thereby avoiding that drivers face different situations from one country to another with the same truck or coach. Policy Package 1 thus addresses the issue of ineffective application and absence of control standards (specific objective 3).

- *Policy Package 2: A more extensive revision*

This package would entail a more intensive (in terms of magnitude of impacts) revision of the Directive, with new measures in addition to the measures proposed in Policy Package 1 including the variants. The additional measures will require a certain adaptation effort from the automotive industry and from the administrations. Far-reaching measures or those requiring a very large adaptation effort from the industry and administrations would still be excluded (measures 3, 8, 14 and 15).

Concerning the aerodynamics of the trucks, in addition to rear flaps, a redesign of the cabin will be allowed, with an increase of the cabin length. This redesign will also be based on technical requirements on aerodynamic performance, road safety and suitability to infrastructure. The same committee proposed in measure 1 will be used for the purpose of measure 2. The reason for which measure 2 on the aerodynamics of the tractors has been proposed in PP 2 and not in PP 1 is a matter of time and amplitude of impacts. A redesign of the cabin is a substantial task for the automotive sector and can have wider implications than rear flaps (on infrastructure, road safety and driver comfort). It cannot be considered as a limited revision of the Directive. The time required for the design and development of new cabins is expected to last several years, in order to take into account other issues such as safety of vulnerable users in accidents, the comfort of the driver and the inclusion of mandatory equipment related to road safety. This is why this measure would be made operational only after a period of several years after the adoption of the Directive.

In terms of controls and enforcement of offences, new binding measures are proposed harmonising the categorisation of infringements throughout Europe, and the obligation for Member States to perform a pre-selection by filtering of vehicles possibly infringing the Directive and targeted for manual checks. Preselection could be determined by weigh-in-motion systems allowing enforcers not to slow down traffic for vehicles complying with the limits, or on-board weighing devices installed in trucks and coaches. The obligation is in terms of performance, not in terms of technical means. A reporting obligation to the Commission would allow measuring the evolution of the rates of infractions, and the effectiveness of the Directive. By developing common EU standards, the revision will encourage the deployment of on-board weighing devices which would transmit the weight of the vehicles and per axle in real time to police officers along the roadside through a DSRC interface (20 meters range). This type of equipment would be linked to the digital tachograph by some functionalities. With such a system, hauliers would also know precisely the weight of their vehicle when loading. Knowing the weight of the vehicle, the haulier will have the possibility to take the appropriate measures to respect the legislation in force.

Road transport operators transporting containers indicated that they often have to rely on the weight stated on the freight documents to ensure compliance with maximum permissible weight limitations. In cases where HGVs are overweight due to inaccurate weight specifications on the freight documents, and in cases where the transport operators had no other means of verifying the total weight, shippers, freight forwarders or other parties having indicated the weight of the containers on the freight documents and having signed these shall be jointly liable in case of infringements.

These measures address the problem of unsatisfactory enforcement (specific objective 3).

- *Policy Package 3: More binding regulatory approach*

Beyond the measures presented in the PP 1 and 2, including the variants, other measures are envisioned, as follows, in order to push forward more actively the realisation of the objectives of the revision.

On the energy efficiency side, rear flaps are made mandatory for new trailers and trucks and by 2025 are made compulsory for older vehicles through retrofitting. This would ensure that the whole European fleet of trucks and trailers is equipped with these devices in a time frame also acceptable for SMEs to adapt their fleets. This measure contributes to meeting specific objective 1 and to address the problem of suboptimal energy efficiency and CO_2 emissions.

Further developments expected in intercontinental sea shipping and containers longer than 45 feet (48 or 53 feet for instance) might have to be accommodated in the future by road transport in a sufficient number to imagine legal instruments beyond special permits. Although data on such containers is scarce, it is known that they are increasingly used in countries such as the USA and China. The Commission might thus be given the mandate to accommodate the evolution of intermodal transport with further modifications of the size and weight limits in Annex I to Directive 96/53/EC, on the basis of studies performed by a committee of experts. The update of the Annex would be made through a Commission Decision. This measure will help to meet specific objective 2 by ensuring that standards on containerisation are constantly updated.

In case the measures described above are not considered as sufficient to cope with the excessive number of infringements against the Directive and in order to correctly implement possible changes in weight limits in the Directive due to the transport of larger containers, onboard weighing devices would be made mandatory to new vehicles produced after 2025

and a percentage of the traffic of heavy goods vehicles and coaches could be fixed that every Member State will have to check manually every year, with an obligation to report to the Commission. The mandatory onboard weighing devices would help in the preselection of vehicles to be inspected by manual checks. The addition of the two measures would ensure the most effective way of lowering the level of infringement currently recorded.

Finally, since the options are incremental, PP 3 contains the same variants "a"/"b"as PP 1 and PP 2 respectively.

- *Overview of measures proposed in Policy Packages*

Table 7: Overview of measures proposed in Policy Packages

	PP1	***PP2***	***PP3***
Specific Objective SO1: To enable the market uptake of more aerodynamic, electric and hybrid trucks and to increase the attractiveness of certain coach services.			
1. Rear flaps	X	X	X
2. Longer cabins		X	X
3. Mandatory rear flaps for all vehicles			X
4. Higher weight limits for electric/hybrid trucks	X	X	X
5. Max. 19 t for two-axle coaches	X	X	X
SO2: To enhance the development of intermodal/combined transport			
6. Allow for 45' containers in *combined* transport	X/Ø	X/Ø	X/Ø
7. Allow for 45' containers in *intermodal* transport	X/Ø	X/Ø	X/Ø
8. Facilitations for larger containers			X
SO3: To ensure better enforcement of the maximum weights and dimensions across the EU			
9. Guidelines on enforcement	X	X	X
10. Common categorisation of infringement		X	X
11. Mandatory preselection of vehicles targeted for manual checks		X	X
12. Co-liability of the shipper/forwarder		X	X
13. Standards for on-board weighting devices		X	X
14. Compulsory on-board weighing devices			X
15. Minimum level of manual checks			X

- **ANALYSIS OF IMPACTS**

The present chapter will assess the impacts of the three proposed policy packages, compared to the baseline, with respect to relevant impacts identified in the Commission Impact Assessment Guidelines[50].

The analysis of the impacts will be partly of a qualitative nature and partly of a quantitative nature where quantitative evidence is available and can be usefully applied in the analysis of impacts.

Due to the policy packages being cumulative, the analysis of the impacts will focus on incremental changes between the policy packages. According to this approach, PP 1 will initially be compared to the baseline, PP 2 will be compared to the baseline and to PP 1 and PP 3 will be compared to the baseline and to PP 2.

o Environmental impacts

▪ *Climate change*

Obstacles caused by Directive 96/53/EC to achieving efficiency gains from road and from intermodal transport were identified as one of the main problems of the present impact assessment. Addressing this problem by way of adapting maximum weights and dimensions of HDVs would allow increasing energy efficiency and consequently reducing GHG emissions, which would provide a positive contribution to the fight against climate change. The current initiative has, in line with the problem definition, identified measures related to aerodynamics of vehicles, which would require an extension or derogation from current maximum length limitations, and related to propulsion systems and to buses, which would require an increase in current maximum weight limitations.

Firstly, concerning aerodynamic devices, it is important to note that the front and the rear of HGVs contribute equally to aerodynamic drag. These two factors are the most influential ones, contributing each to approximately 1/3 of the overall aerodynamic drag of HGVs[51]. As 40% of the fuel consumption of HGVs is used to overpower aerodynamic drag[52], these two factors are significant, and lowering any of them could potentially lead to important reductions in fuel consumption. Such reductions would help prevent climate change.

The rear of HGVs creates a low-pressure zone 'pulling' vehicles backwards, which is responsible for approximately 35% of all drag affecting a tractor with a semi-trailer[53]. By installing aerodynamic devices at the rear of trailers it is possible to achieve gains of 5 to 8 % (or possibly even 15 % when combined with aerodynamic cabins) in fuel consumption[54], which would result in a similar reduction in GHG emissions. The performance of these devices increases with their length and would require an extra length ranging between 0.5 m and 2 m. It can be demonstrated that, in this range, there is a near-linear relationship between the length of aeodynamic rear devices and the resulting fuel saving. This relationship does not extend beyond 2 metres, after which any additional effect would diminish[55].

However, an assessment of the impacts of extra length due to the fitting of aerodynamic devices would have to be based on their actual effectiveness (and safety – see below), which is closely related to speed, and hence to use, as displayed in Figure 4 below.

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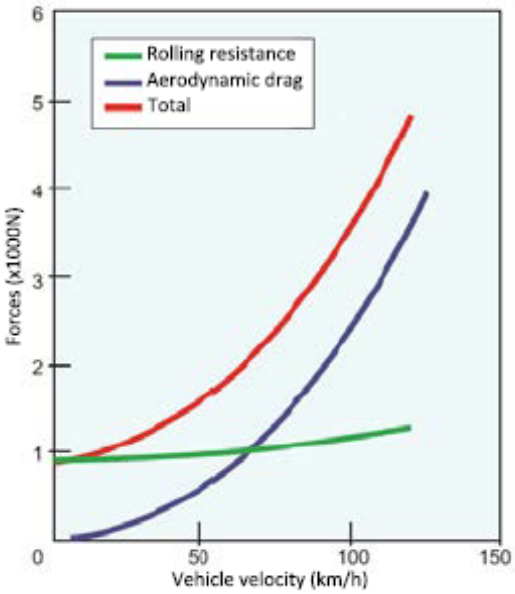
50 Impact assessment guidelines, SEC (2009) 92.
51 FKA Report 104190, Aachen 2011.
52 See section 2.
53 Gandert M.R. Van Raemdonck, *Design of Low Drag Bluff Road Vehicles*, 2012.
54 French IFSTTAR laboratory and the Belgian Institute BRRC.
55 French IFSTTAR laboratory and the Belgian Institute BRRC.

Figure 4: Fuel consumption according to speed



Source: Trailer aerodynamics, PART - Platform for Aerodynamic Road Transport, 2012

As highlighted by the IRU during the public consultation, while studies convincingly demonstrate that rear flaps would allow recovering the investment costs by lowering fuel consumption in long-distance transport, no trials have been performed to demonstrate how much a standard truck performing short- or medium-distance trips would gain in fuel reduction during its lifetime. Should it turn out to be insufficient, it may limit the attractiveness of rear flaps for many hauliers. Hauliers also warn of possible problems linked to damage to flaps during loading or unloading.

Regarding the front of HGVs, one recent study[56] has shown that if the lower part of the front of the driving cabin was streamlined and extended by 0.8 m, the aerodynamic drag coefficient (C_D) would drop by 6.4 % resulting in a reduction of fuel consumption by 3.2 to 5.3 %. Shorter extensions (0.4 m) of cabins would yield markedly poorer results (4.5% reduction in C_D). With a longer extension (1.2 m) the gain would increase to 8.9 %. These results were also obtained on high-speed long-distance trips.

In Table 8 below, fuel savings for HGVs, and the corresponding climate change mitigation, are estimated at different market penetration rates of the various policy measures. It should be noted first of all that the data used in this table are based on modelling and projections (for instance of fuel prices) and may therefore only give an estimate of the foreseen effects. Furthermore market penetration rates are likely to differ for the policy measures due to differences in the product cycles and in investment requirements. Whereas rear devices could be deployed relatively quickly, including their installation on existing vehicles, and would require a minor investment, the deployment of cabin re-designs and hybridisation are expected to have longer lead times due to higher investment requirements and/or longer product development cycles. It is should however be highlighted that providing estimates on the uptake of such devices is challenging due to their innovative nature.

[56] FKA Report 104190, Aachen 2011

The vehicle stocks are determined according to the use made of the devices described above. Of the total estimated EU HGV fleet in 2030 (9.8 million vehicles), only those above 20 tonnes in maximum weight are expected to be equipped with rear devices and cabins (41.5% or slightly more than 4 million). Roughly 1 in 4 (around 25%) of these are thought to be used to travel long distances (about 1 million). Due to their safety benefits in urban contexts, the fleet of vehicles using new cabins is expected to be larger than the one equipped with rear flaps. However the fuel savings linked to their aerodynamic properties will only take place on long-distance high-speed trips. The fleet used to estimate the fuel savings from this measure is therefore the same as for vehicles using rear add-ons.

Moreover, in order to calculate the fuel savings (in million litres) for the potential stock of HGVs at different market pentration rates, it was assumed, using statictics from Eurostat and evidence from France, Germany and the UK, that average HGVs drive between 39,000 km/year (short distance) and 98,000 km/year (long distance), and that HGVs on average consume 30 litres fuel per 100 km.

The total fuel saving (in million Euro) was calculated multiplying the resulting fuel savings (in litres) by the forecasted price of fuel in 2030 of 2.10 €/litre from the the PRIMES-TREMOVE reference scenario.

The carbon reduction potential (in tonnes) was calculated multiplying the total fuel saving (in litres) by the carbon content of diesel (2.6 kg CO_2 / litre, diesel) and the benefit in terms of the lower contribution to the climate change (in Euro) was calculated multiplying the total carbon reduction potential (in tonnes) by the estimated price of carbon in 2030 of €36/tonne from the DG Clima IA on a Roadmap for moving to a competitive low carbon economy in 2050.

Table 8: Estimated fuel saving and corresponding climate change mitigation (2030)

		HGVs (>3.5 tonnes)			
		Market penetration			
Measures	**EU27 Stock**	**25%**	**50%**	**75%**	**100%**
Rear devices (7.5% fuel saving)	1,017,106	449	897	1,346	1,794
Cabin re-design (4.25% fuel saving)	1,017,106	126	253	379	506
Hybridisation (25% fuel saving)	5,815,675	4,253	8,505	12,758	17,011
Total fuel saving (million litres)		*4,828*	*9,655*	*14,483*	*19,311*
Total fuel saving (million Euro)		*9,655*	*19,311*	*28,966*	*38,622*
Carbon reduction (1000 tonnes)		**12,552**	**25,104**	**37,656**	**50,208**
Climate change mitigation (million Euro)		**452**	**904**	**1,356**	**1,807**

Source: Own calculations (main assumptions: 1. Forecasted EU27 HGV stock of 9.8 million by 2030 from PRIMES-TREMOVE reference scenario of which 25% drive mainly long distance, 2. Average HGVs drive between 39.000 km/year (short distance) and 98.000 km/year (long distance) and consume 30 liter diesel/100 km[57], 3. The forecasted price of fuel is 2.1 €/liter in 2030[58],, 3. Price of carbon in 2030 is €36/tonne[59]).

These results show distinct progress in comparison to the baseline scenario.

[57] Based on data from Eurostat and evidence from France, Germany and the UK.
[58] PRIMES-TREMOVE reference scenario – same as the reference scenario used for the 2011 White Paper.
[59] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2011:0288:FIN:EN:PDF

Hybridisation of lorries and of buses could potentially lead to a reduction in fuel consumption of 20-30%[60]. By allowing the extra weight to carry these propulsion systems, and in addition, extra weight to handle the increase in weight of passengers and their luggage, and the extra weight required for mandatory safety equipment, the payload could be maintained[61] resulting in an increased energy efficiency per tonne/passenger transported. If on the other hand such propulsion systems were introduced without an allowance to increase the total weight of vehicles, the payload would have to be reduced which would off-set potential gains in energy efficiency per tonne/passenger transported, and hence potentially hamper the market uptake of such propulsion systems. Concerning the weight of the passengers in buses, maintaining the current total weight of buses (and therefore limiting the passenger capacity) would restrict the shift from personal to public transport, which is being promoted by the EU among others to protect the environment.

Lastly, reducing the administrative burden on the use of 45' containers is likely to increase their use in Europe, which is currently impaired due to the high cost and administrative burden linked to obtaining a permit to move these containers. By facilitating the transport of containers which are mainly used in combined and intermodal transport after arriving by sea, this measure would promote combined and intermodal transport and thus increase energy efficiency compared to road-only transport operations. Furthermore, transport operations using these containers can be more energy efficient than those using their smaller counterparts. As 45' containers allow placing two additional pallets on the floor, and more while being stacked, the fuel consumption per pallet would decrease. Moreover, the total number of container movements could be reduced, assuming constant freight volumes, and this reduction would be proportional to the uptake of 45' containers. Lastly, the increased use of 45' containers would benefit short sea shipping in Europe, thus further increasing the use of modes with a lower carbon impact.

The facilitations for the transport of 45' containers will have different impacts depending on whether this is limited to combined transport (variant "a"), or extended to all intermodal movements (variant "b"). In the first option, the use of 45' containers will be restricted to certain types of intermodal transport only (for instance within 150 km of a sea or inland waterway terminal, see glossary for full definition). As intermodal transport represents a wider market than combined transport, in the second option ("b"), 45' containers are likely to penetrate the market faster and deeper. Their wide-spread use will increase the average load per container, and therefore reduce the fuel consumption per transported pallet.

The increases in energy efficiency will result first of all from the increase of traffic in intermodal transport using more energy-efficient modes such as rail and waterways, which will in turn lead to an overall lower fuel consumption of the transport sector. Restricting the facilitations to combined transport will also create incentives for greater use of transport modes alternative to the road, and thus allow for GHG emission reductions through modal shift. However, due to the strict definition of combined transport (see glossary on p. iv), the use of the 45' containers will remain more limited (mainly to rail-road solutions) than under variant "b" (road-short sea shipping solutions would also be possible). The question if the new rules on 45' containers should be applied to combined or intermodal transport, i.e. whether variant "a" or "b" prevails, therefore remains open.

Compared to the baseline, **PP 1** would contribute to increasing energy efficiency by allowing aerodynamic devices on the rear of HGVs, by allowing extra weight to carry batteries or dual

[60] http://www.volvotrucks.com/trucks/global/en-gb/trucks/new-trucks/Pages/volvo-fe-hybrid.aspx
http://www.daf.com/EN/Products/Model-Range/Pages/DAF-LF-Hybrid.aspx

[61] as compared to 1996 (see description of measure 6).

propulsion systems and by equally allowing extra weight of passengers and of mandatory on-board safety equipment. Allowing the use of 45' containers in combined/intermodal transport would additionally increase energy efficiency compared to the baseline. Variant "b" would enable a larger take-up of 45' containers in intermodal transport, which would have additional positive impacts on climate change mitigation. This positive impact could however be lowered by a reverse modal shift of a magnitude which is difficult to estimate.

PP 2 contains the same measures as PP 1 and will therefore bring at least the same impacts. **PP 2** would allow additional improvement to the aerodynamics of cabins of HGVs, a more substantial reduction of pollution and of fuel consumption.

Compared to PP 1 and PP 2, **PP 3** proposes to make aerodynamic devices at the rear of HGVs mandatory. Although this measure would have merits in ensuring a broad implementation of such devices, the incremental gain in energy efficiency would liekly not pay for the additonal costs imposed on the transport operators. As displayed in Figure 4 above, the measure delivers full potential only for HGVs driving at higher speeds on motorways, which would mainly affect international/long-distance transport in which only about 25% of the total stock of HGV is used[62] but which obviously accounts for a larger share of total vehicle-kilometres. Other HGVs, driving mainly shorter distances, would not be able to achieve the same improvements in energy efficiency, and the return on investing in aerodynamic devices would be correspondingly much lower. Compared to the baseline scenario, PP 3 would not bring more benefits than PP 2.

- *Air pollution (NO_x, PM, SO_x, HCs, CO)*

The reduction in emissions of particulate matters (PM) and other air pollutants (NO_x, SO_x, CO, HCs) will be proportional to the ones in greenhouse gases, which are described above.

However, whereas climate change is a global concern, impacts of air pollution are considerably more severe in urban areas than in rural areas. This implies that **PP 1**, allowing additional weight for electric and dual propulsion systems used for mainly short distance transport in urban areas, would generate considerable benefits as compared to the baseline. The additional measures included in **PP 2** and **PP 3**, achieving their full impact only in long-distance transport, would generate smaller additional benefits in terms of reducing harmful air pollutant emissions.

- *Noise*

In road transport, the sound emitted is mainly produced by the propulsion system and by the sound of the tyres[63]. The speed generally determines which one of the two sources is the most dominant. At lower speeds, the tyres represent the main source of noise, while the propulsion system is the main source of noise at higher speeds.

The proposed measure in **PP 1** aimed at increasing the maximum weight of vehicles to accommodate for electric and dual propulsion systems is expected to facilitate the market uptake of such vehicles. Compared to the baseline, where engines are almost entirely diesel

[62] All HGVs with a Community licence are assumed to be active in long-distance transport. The total stock of HGVs according to the TREMOVE version 3.3.2 is 6.5 million and 1.7 million of these have a Community license, which is needed for carrying out international transport operations.
(see http://ec.europa.eu/transport/road/doc/2010_04_12_carriers.pdf)

[63] Internalisation Measures and Policies for All external Cost of Transport (IMPACT), Deliverable 1, 2008.

driven, PP 1 would have a positive impact on noise as electric and dual propulsion systems are more silent[64]. Moreover, this impact may be significant due to the fact that electric and hybrid vehicles would tend to drive in urban areas where (1) the average speed is low and the noise impact of engines is higher than the one of tyres and (2) noise affects more people than in rural areas.

Other measures proposed in the three policy packages are expected to have no or very limited impacts on noise. Although no specific acoustic test of rear flaps or improved cabin design has been made, other aerodynamic devices not requiring a change in dimensions (side skirts) are reported as having no impact on noise[65].This is due to the sources of noise described above (from the propulsion systems and tyres) which are not impacted by the addition of aerodynamic add-ons or design of the cabin.

- **Economic impacts**
  - *Impact on the functioning of the internal market and competition*

The lack of compliance with Directive 96/53/EC, as identified above, results in a distortion of competition between road transport undertakings and contributes to a suboptimal functioning of the internal market. The impact of the policy packages on the functioning of the internal market and competition will hence be proportional to their effectiveness in reducing the level of non-compliance.

PP 1 proposes the introduction of guidelines on common principles and methods of controls, the provision of expert knowledge and the dissemination of best practice to relevant stakeholders. This should contribute to avoiding misinterpretations on the content of the Directive and to limiting the trouble caused to international drivers by differing national legislations, including a suboptimal planning of trips. They would also help to ensure that enforcement procedures are performed according to the same methodologies in all countries of the EU. Other positive impacts are the alignment of the conditions of competition between hauliers of different Member States, and an improvement of the compliance rate.

The benefits of improved enforcement are multiple, including improved road safety and reduced damage to pavements and bridges from overloading, along with associated lower maintenance costs. It was estimated in a research project[66] that between 2.3 and 5.3% of maintenance costs are caused by overloaded HDVs, which amount to an estimated cost of € 575 million to € 1,325 million[67]. However, in Member States where such guidelines would not be applied (as may be the case due to reductions in enforcement budgets and staff, or in order to support local hauliers by not fining them in case of overloading), transport undertakings would continuously have an incentive to infringe the Directive by overloading vehicles, which would negatively impact the functioning of the internal market and competition.

In comparison to the baseline scenario, PP 1 would improve compliance, help to avoid distortions of competition resulting from overloading and reduce the costs of maintaining the infrastructure.

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64 http://www.volvotrucks.com/trucks/global/en-gb/trucks/new-trucks/Pages/volvo-fe-hybrid.aspx

65 Design of Low Drag Bluff Road Vehicles, Gandert M.R. Van Raemdonck, 2012.

66 http://iswim.free.fr/doc/remove_WP4_costbenefit_analysis.pdf

67 The annual road maintenance cost in the EU in 2009 is estimated at € 25 billion. source:ITF and DG MOVE estimate for the purpose of this IA

PP 2 provides the same benefits as discussed above . In addition, PP 2 would introduce more binding control provisions and harmonised categories of infringements, which would guarantee a higher rate of compliance with Directive 96/53/EC. Introducing harmonised categories of infringements has demonstrated its effectiveness in other legislations, for instance on the control of travel times with the help of the digital tachograph. The most serious infringements have been greatly reduced, as the consequence might lead to a loss of operating licence for the haulage company. Filtering for pre-selection is a way to ensure that a high number of vehicles will be controlled without creating traffic jams or losses of time for drivers and operators complying with the rules, therefore supporting efficient logistics services.

By using filtering techniques, vehicles for closer manual inspection will be selected by automatic means (weigh-in-motion stations) or by categorising the relevant companies or vehicles as relatively more suspicious. With filtering and the same amount of enforcement officers, the effectiveness of checks will be drastically improved. A study in the Netherlands concluded that the 'hit rate' of vehicles is 50%[68], implying that 50% of the vehicles stopped using manual selection were overloaded while the other 50% were stopped and delayed for no objective reason. Applying these numbers to the numbers quoted earlier from TISPOL in chapter 2.2.2 provide an indication of the number of unnecessary checks which are carried out using manual selection, i.e. 75,192 per year for the 14 TISPOL members.

Introducing on-board weighing devices in the vehicles, as has been proposed by the European Parliament in its opinion of 3 July 2012 on the Commission proposal to amend the tachograph Regulation (EEC) 3821/85[69], will help drivers to know precisely and in real-time if they are infringing the regulations or not, and what the consequences might be. The transmission facility from the unit to police forces with a DSRC interface already widely used for electronic tolling, and soon to be added in the digital tachograph as foreseen by the above mentioned Commission proposal, will also help to control vehicles efficiently without any stops. As mentioned above, such discrepancies are today suspected of being the cause of several infringements, and weighing stations would give drivers the mean to refuse the load.

In comparison to the baseline scenario, this policy package would further reduce the costs of infrastructure maintenance and improve compliance with maximum loading standards. Although the iniatial cost of setting up filtering systems and introducing on-board weight sensors would increase the cost of this package in relation to the baseline for enforcers and hauliers, it is expected that these costs will be offset in the longer run thanks to the decrease in infrastructure costs, savings from more effective checks and fewer fines for hauliers.

PP 3 goes further than PP 2 by proposing to make on-board weighing devices mandatory by 2025 and by introducing compulsory thresholds for checks of HDVs. Such on-board weighing devices are commonly used in the USA and in Australia, and also by certain HDVs in Europe. Their cost range from between € 3000-12000[70] and they can fairly easily be mounted. The mandatory introduction of these devices presents a number of positive impacts:

- no driver could claim, in case of an offense, that he did not know his situation, which apparently often appears with non-regular drivers (rented trucks or vans for instance)

[68] http://iswim.free.fr/doc/remove_WP4_costbenefit_analysis.pdf.

[69] Proposal for a Regulation of the European Parliament and of the Council amending Council Regulation (EEC) No 3821/85 on recording equipment in road transport and amending Regulation (EC) No 561/2006 of the European Parliament and the Council , COM(2011) 451 final.

[70] Source: International Society on Weigh-In-Motion (ISWIM)

- the number of infringement is lower with equipped vehicles (around 3 % in some studies) than with non-equipped ones (1/3 in some on-site controls as presented above)[71], leading to an increased compliance rate of the vehicles in comparison to PP 2.
- the system protects the vehicle and infrastructure against exceptional wear due to overweight
- extra expenses (from fines, loss of licenses, immobilisation of vehicles…) could be easily avoided for hauliers, thus making the cost of non-compliance higher and the incentives not to fraud the Directive more important.

However, a mandatory introduction may cause financial difficulties, particularly for SMEs, as described in Chapter 5.2.4.3.

In comparison to the baseline scenario, PP 3 would increase compliance and reduce costs for enforcement authorities, but also create significant costs for hauliers having to use on-board weight sensors.

The introduction of thresholds for checks, on the other hand, may prove to be less efficient due to important subsidiarity considerations and due to different situations in Member States, which may result in relatively modest thresholds, which may not be sufficiently dissuasive.

▪ *Impact on competitiveness*

There are different ways in which the proposed policy packages can impact Europe's competitiveness. Firstly, allowing aerodynamic devices on the rear of trailers will create a new market for European manufacturers and thus employment, including at existing trailer manufacturers and at other specialised non-OEM equipment manufacturers. It is expected that the costs of redesigning the cabin will fall under the research & development heading of HGV manufacturers, thus limiting the cost of such a measure. Secondly, allowing changes to the cabin design will create new market possibilities for European automotive manufacturers in the EU and in other world regions, which would positively impact employment in the sector. The same would be the case for electric/hybrid vehicles and for on-board weighing devices. All regions of the world face the same problems or energy efficiency and of pollution. Currently, the American industry does not have the limitations imposed by Directive 96/53, and is able to provide solutions to other countries, like the emerging ones. The new designs of the European tractors, the experience gained in aerodynamics and hybrid propulsion will help the European industry to regain market shares with new innovative solutions.

Thirdly, implementing measures to increase the energy-efficiency of HGVs may have a slight impact on freight rates and thus on the cost of final products, which would enable these to stand stronger in the competition against products from other world regions. Finally, facilitating transport of 45' containers will strengthen the links between modes leading to more efficient logistics, and improve the competitiveness of the transport sector as a whole.

PP 1 would consequently, compared to the baseline, have positive impacts on competitiveness, and also in relation to the baseline, **PP 2** would furthermore add to these positive impacts. **PP 3**, on the other hand, would not add any significant impacts to the previous PPs, meaning that impacts would be similar to PP 2 in this respect.

▪ *Impact on transport sector*

The present initiative is foreseen to have different major impacts on the transport sector and on the efficiency of the transport system as a whole. Firstly, lower consumption of fuel per

[71] French IFSTTAR laboratory and the Belgian Institute BRRC

unit of freight will improve the efficiency and profitability of hauliers. Secondly, the interplay between the different transport modes would be improved by facilitating the transport of 45' containers. This would notably benefit combined and intermodal transport operations. Moreover, allowing a total weight of vehicles of 44 tonnes when transporting 45' containers as part of a combined transport operation would increase the relative efficiency of combined and intermodal transport, which would benefit mainly non-road modes over longer distances (see chapter 2.2.1). Thirdly, increased compliance with Directive 96/53/EC due to the introduction of harmonised control and strengthened standards and methods infrastructure would discourage overloading of HDVs and in turn reduce damages to the infrastructure. Finally, supporting the use of public transport by increasing the weight of buses will contribute to shifting passenger traffic from private cars to public transport, thus reducing congestion and improving capacity use of infrastructure.

In view of the above, it is expected that **PP 1**, compared to the baseline, would have a positive impact on the transport sector. **PP 2**, would have additional positive impacts on intermodal transport and on infrastructure preservation, which would benefit the transport sector and the wider society. **PP 3** proposes to examine further evolutions of the intermodal transport sector, which - in term - may represent additional benefits to the transport sector but which currently are highly uncertain and therefore considered neutral in this context.

- *Impact on the administrative burden, public administrations and onSMEs*

- Impact on the administrative burden

As mentioned by stakeholders during the consultations, the current administrative burden related to the transport of 45' containers is considered high, which was identified as a problem in this Impact Assessment and which resulted in the proposition of measures 6-7. The suppression of special permits for standard 45' containers will be a progress on that matter (see chapter 2.2.1).

Similarly the differences in control procedures and the lack of knowledge of the different weights and dimensions limits create uncertainty and burdens in everyday operation. Truck drivers are sometimes facing situations where they have to justify their situation in another language in front of police forces, even when they consider not to be infringing the legislation. Improving and harmonizing enforcement practices will help to increase transparency and alleviate this burden.

Furthermore the introduction of filtering and of automatic systems for enforcement (on-board weighing devices and weigh-in-motion stations) will reduce the administrative burden currently resulting from roadside checks for hauliers. Avoiding 75.192 unnecessary checks[72] (see section 5.2.1) would result in time saving for the undertakings.

Hence, **PP 1** would have a positive impact by reducing the administrative burden. Compared to PP 1, **PP 2** would represent a slight decrease in the administrative burden due to less unnecessary checks. **PP 3** is expected to be neutral as compared with PP 2[73].

[72] For the 14 TISPOL members.

[73] Given that no other administrative burdens were identified and given that little/no data is available to quantify the burden using the Standard Cost Model, it was decided to carry out a qualitative assessment.

- Impact on public administrations

The Dutch study referred to in chapter 5.2.1 estimated that an average manual check lasts 35 minutes, involving 3 police officers and of course the driver of the vehicle. Like for undertakings, avoiding 75,192 unnecessary checks[74] would result in a time saving of police officers of 138,586 hours, which could be saved or used for other purposes where additional resources would be required. However, the reporting obligation introduced in PP 2, and also in PP 3, would result in an additional administrative burden on Member States.

The introduction of around 250 new WIM stations by Member States is sufficient to cover the whole TEN-T network,[75] which would amount to an annual cost of around € 7 million (on the basis of an average individual cost of € 150,000 and a lifetime of 5 years, plus € 150,000 to € 350,000 for civil works and others – one-off cost, as detailed in footnote 83).

- Impact on micro enterprises and on SMEs

The transport sector is characterised by many SMEs, and hereunder micro enterprises; actually, more than 80% of the companies active in the sector are micro-companies with less than 10 employees.[76] Therefore any change to the legislation affecting the sector must apply to the micro enterprises in order to be effective.[77]

Although SMEs are likely to be impacted financially by the proposed measures, the rapid pay-off of aerodynamic devices and fuel-efficient cabins is likely to be convincing enough to ensure their uptake, or, in the cases where self-financing is not available, to facilitate access to credit. For larger transport undertakings, investing in aerodynamic devices and more fuel-efficient cabins is not likely to be problematic given the clear business case for these.

Should the uptake of the new devices by SMEs be unsatisfactory, the Commission may at a later stage examine possible additional measures through the TEN-T funds, the European Regional Development Fund or the Horizon 2020 programme to overcome this problem for instance by providing financial support to innovative road SMEs or by amending the "Eurovignette" Directive 1999/62/EC[78] to allow toll rebates for vehicles equipped with aerodynamic devices. These measures are however not part of this revision process and therefore not subject to this impact assessment.

The mandatory introduction of onboard weighing devices is expected to cost around 4,000 € per vehicle, which is quite high in comparison with the benefit that a company can expect to recover from saved time in unfounded manual checks. This negative impact stands against the potential benfits from an increased effectiveness of the directive due to a higher compliance rate of the vehicles.

Consequently, compared to the baseline, **PP 1** would not lead to a substantially increased financial burden on SMEs. **PP 2** would produce a slightly higher impact compared to PP 1, while **PP 3**, proposing a mandatory introduction of aerodynamic devices, would cause a significant additional financial burden on SMEs, which should however be rapidly off-set by the additional savings.

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74 See chapter 5.2.1.

75 As suggested by the International Society on Weigh-In-Motion (ISWIM), we assume that the network is fully covered with a WIM station every 500-750 km on motorways and every 1,000-1,500 km on national roads.

76 European Commission, Road Freight Transport Vademecum, March 2009.

77 This justifies the inclusion of micro-companies in the scope of the legislation as required by the Commission Communication on "Minimizing regulatory burden for SMEs - Adapting EU regulation to the needs of micro-enterprises" [COM (2011) 803 final].

78 Directive 1999/62/EC of the European Parliament and of the Council of 17 June 1999 on the charging of heavy goods vehicles for the use of certain infrastructures; OJ L 187 of 20.7.1999, p. 42.

- **Social impacts**
  - *Impact on working conditions, health and lifestyle of drivers*

As mentioned above, the large scale deployment of rear flaps on the European truck fleet would increase the market opportunities of manufacturers of such equipment and, as a result, also the employment in the sector. Furthermore it is not expected to entail any particular training costs for road haulage companies. Indeed the existing prototypes or devices marketed outside of the EU are mounted on hinges and can be folded simply by pushing the device which folds onto itself and onto the doors at the back of the trailer. Devices have also been developed with electric actuators which automatically fold the side wings when entering into built-up areas or when the vehicle is stationary.

While this initiative would have no noteworthy impact on employment of truck drivers, it would, as mentioned earlier, benefit them by allowing changes to cabins, which would allow for more comfort[79] compared to the current cabins, which were designed to take up as little space as possible to allow for increased loading space. In contrast, a larger cabin would allow space for larger bunks as well as space for a second driver in tractors where two drivers are required. Drivers would, on the other hand, possibly be confronted with an additional task related to the folding and unfolding of aerodynamic devices on the rear of trailers. This task would be required during loading and unloading as well as when entering urban environments where the equipment, depending on the circumstances, may have to be folded for reasons of safety and manoeuvrability. Additional training would be necessary, in case where these devices could not be automatically folded or deployed from the cabin.

Overall, it is therefore expected that **PP 1** will have little impact on working conditions, whereas **PP 2** and **PP 3** will have a positive impact on working conditions.

  - *Impact on road safety*

The measures proposed in the current Impact Assessment could potentially have a significant impact (positive or potentially negative) on road safety, and manufacturers would have to consider these impacts carefully to mitigate any risk of increasing the number of accidents involving HGVs.

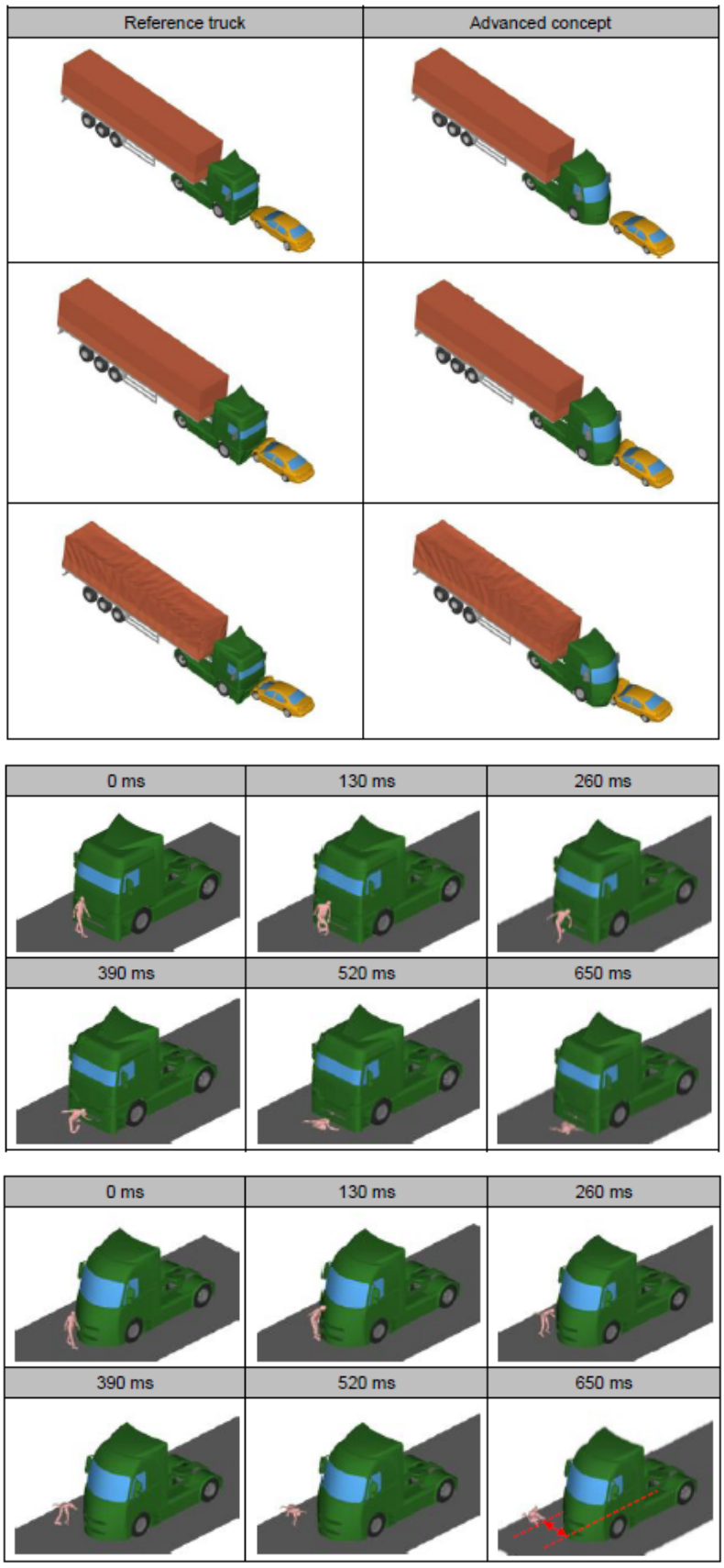
Firstly, considering the positive impacts, re-designing cabins would according to a German study (see illustrations below)[80]:

- improve the direct as well as the indirect vision of the driver, limiting the dead vision angle;
- reduce damages to other vehicles in the event of frontal collisions;
- fully reduce the risk of underrun of pedestrians or cyclists as shown in the pictures below.

Figure 5: Impact on road safety of redesigned cabins

[79] Long-haul drivers spend an average of four nights per week in the HGV (according to "Smarter, Safer and Cleaner", T&E, 2012)

[80] FKA Report 104190, Aachen 2011



Source: FKA Report 104190, Aachen 2011.

It is estimated that changing the cabin design could save 300 to 500 lives per year[81], i-e a reduction of 10% of the current fatalities in accidents involving trucks. Redesigning the cabin could provide an opportunity to stakeholders to consider additional means of safety improvements such as crumple zones on the front of the tractor, but these questions – which go into technical specifications of cabins rather than their strict dimensions – are beyond the scope of this revision.

Moreover, during the targeted stakeholder meetings, experts highlighted the important relation between braking times, the severity of accidents and the weight of vehicles. Non-compliance with the weight limitations of Directive 96/53/EC, which was identified as one of the problems in this Impact Assessment, could have a negative impact on road safety, and these may be mitigated by the proposed control standards and methods proposed in the context of this initiative.

Secondly, some measures could have a potentially negative impact on road safety. This may be the case for the rear-end aerodynamic devices, which could mask vehicle lights and which would slightly increase the risk of being turned over by strong side wind or even of jack-knifing[82]. Rear-end aerodynamic devices could also pose a risk of underrun and its installation may require special rules on marking, material used (to absorb shocks) and/or underrun protection device. This is the reason why it is proposed to subject the authorisation of these devices to a number of requirements relating to road safety before manufacturers are allowed to equip trailers or tractors with such systems which in any case will need to be certified by national authorithies. This measure is expected to limit the possible negative impact of making such devices mandatory for new vehicles in PP 3. Then, the equipment would have to be certified by the Member States authorities.

Furthermore the increase in compliance with maximum loading limits is expected to have a positive effect on road safety. Indeed the severity of accidents is increased when these involve heavier vehicles. Therefore the positive impact on road safety of the various policy packages can be expected to reflect the increase in compliance with weight limits: positive in PP 1, more positive in PP 2 and slightly more positive in PP 3.

The net impacts of the above mentioned measures are difficult to assess. However, assuming that the future detailed requirements defined by the Commission will reduce negative impacts to a minimum, the net impacts are likely to be positive. Following the reasoning, **PP 1** would have a limited impact on road safety, **PP 2** would significantly and positively impact road safety whereas **PP 3** would not have a much greater impact than PP 2.

o Summary of impacts

The above discussion may be summarized as follows:

- Taking into account the possibility to add rear aerodynamic devices to trailers, and to the possibility to develop heavy vehicles with electric or hybrid propulsion, PP 1 will have a positive impact on fuel consumption (5 to 10 %), and on air pollution. The carbon footprint reduction can be estimated at around 24 million tonnes per year for the operational objective of 50 % long-distance trailers equiped in 2030. An improved effectiveness of the directive due to increased enforcement will also have very positive impacts on competition, the functioning of the internal market, the cost of road maintenance, and the number of injured persons in accidents due to overweight vehicles. The impact on economic efficiency of the road transport sector will be

[81] FKA Report 104190, Aachen 2011.
[82] French IFSTTAR laboratory and the Belgian Institute BRRC.

improved by promoting containerisation without having a reverse effect on other modes of transport such as rail or inland waterways. Administrative costs for both public and private sectors will go down as a result of the reduction of the number of special permits and as a rationalisation of the manual checks performed by police officers on overweight vehicles. PP 1 will also facilitate the development of intermodal transport by the possibility to transport containers of 45' without a special permit and its administrative cost.

- PP 2 will provide a much larger fuel reduction due to the redesign of the tractor, with potential fuel savings approaching 15 % on motorways. It will lead to an improvement of the carbon footprint of 27 million tonnes per year for the same target of equiped vehicles as above. PP 2 will also have a high positive effect on road safety, due to the saving of a few hundred lives (see chapter 5.3.2) every year with a better design of the tractor. More efficient checks of overweight vehicles with filtering methods will have a considerable positive effect on competition, and on the reduction of unnecessary checks, thus on the administrative costs associated to checks. The cost of the necessary equipment for the filtering will be recovered easily by the savings on road maintenance, and on police forces required for the checks. Lastly, PP 2 will have the same positive impact on the development of intermodal transport than PP 1.
- PP 3 on the other hand will not provide real additional benefits in comparison to PP 2 in terms of fuel saving and pollution, due to its negative impact on the financial burden on SMEs if the aerodynamic equipments were rendered mandatory. A similar difficulty would occur with a mandatory introduction of onboard weighing devices, even if PP 3 would certainly improve the effectiveness of the directive: the cost of a mandatory equipment is currently considered too high for SMEs. In terms of containerisation, PP 3 proposes to deal with larger containers than 45', but the real benefit of this measure would be questionable when the reverse effects on road safety and model shift to rail and inland waterways would need to be verified much more deeply. The added value of PP 3 in comparison to PP 2 is questionable, but all the positive impacts of PP 2, as described above are kept in PP 3.

- **COMPARING THE OPTIONS**

This section provides an assessment of how each policy option contributes to the realisation of the policy objectives, as set in chapter 3, in light of the following evaluation criteria:

effectiveness – the extent to which options achieve the objectives of the proposal;

efficiency – the extent to which the objectives can be achieved at least cost;[83]

coherence – the extent to which policy options are likely to limit trade-offs across the economic, social, and environmental domain.

o Effectiveness

The following table provides a synthetic overview of the effectiveness of the various policy options with regard to the specific policy objectives (SO) defined in chapter 3, based on the assessment of impacts provided above.

Table 9: Effectiveness of envisaged policy packages in relation to the objectives

Specific Objectives	PP 0	PP 1	PP 2	PP 3
SO1**: To enable the market uptake of more aerodynamic, electric and hybrid trucks and to increase the attractiveness of certain coach services.**	-	Medium	High	High
SO2**: To enhance the development of intermodal/combined transport**	-	High	High	High
SO3**: To ensure better enforcement of the maximum weights and dimensions across the EU**	-	Medium	High	High

The issue of studying the future evolution of containerisation is raised in PP 3, and with it the possibility of empowering the Commission to authorise the transport of larger containers than 45' by delegated acts. Considering the very low level of use of such containers, the necessary extension of the trailers by more than 1 m and the current differences in opinions expressed by stakeholders concerning longer trucks in general, it does not seem feasible to retain this measure in the prefered policy option.

Concerning the choice between combined and intermodal sub-options in the development of containerisation, it appears that measure 6 would lead to a reverse modal shift to road from other modes of transport, as the limitation in certain cases of the road leg to 150 km would push shippers to use road transport for the whole operation. This is why measure 7 is the preferred sub-option on containerisation.

o Efficiency

In terms of costs required to achieve the objectives identified in this IA, the implemention of some of the measures contained in the policy packages would necessitate investments from public authorities and from private entities. These costs are tentatively identified below:

[83] Given the limited availability of data related to some policy measures and the difficulty of quantifying and monetizing the costs and benefits of these, a full cost-benefit analysis could not be performed. Alternatively, as indicated in the Commission Impact Assessment Guidelines, a partial cost-benefit analysis has been performed quantifying policy measures where feasible and performing a qualitative assessment of other measures.

- PP 1, proposing a light revision of Directive 96/53/EC and consisting of voluntary measures, will have a relatively minor impact on costs:
  - Transport undertaking may choose to equip the rear of their HGV fleet, or part thereof, with aerodynamic devices costing approximately € 3,000 per device.

- PP 2 includes additional measures involving potential costs on a first instance:
  - The development of new cabin designs would entail a cost on those automotive manufacturers who would choose to use the additional flexibility, although it is expected that these costs could be partly covered through existing R&D budgets. This is why manufacturers ask for a sufficient lead time before the implementation of the amended Directive. Allowing this implementation period is expected to result in retail prices of these new cabins to be more or less at the same level as current cabins. However, no quantitative evidence is currently available on this point.
  - Requiring a compulsory preselection of vehicles from Member States when carrying out checks will have cost impacts or alternatively lead to a redistribution of resources. As an illustration of likely costs, the total annual cost of a WIM system allowing pre-selection of overloaded vehicles, including enforcement and static scales, is estimated to be € 322,500[84]. The cost of the equipment for a purely manual control and enforcement system is around € 160,000, to which must be added the manpower cost to perform the checks. These cost estimations do however not take into account the cost of existing manual checks which they may replace. The cost difference in the equipments explains also why a manual system is relatively inefficient allowing only 10 HGVs to be checked per day, resulting in a time-loss of drivers and of enforcement officers as well as in infrastructure damage and in safety risks from overloaded HGVs which were not apprehended. The use of automatic systems to target vehicles to be checked manually can hence be expected to be more cost effective than completely manual solutions.

- PP 3, proposing mainly mandatory measures, will have more important cost implications:
  - Mandatory on-board weighing devices and aerodynamic devices on the rear of trailers would oblige transport undertakings to install these at the approximate price mentioned above. This may place a challenging financial burden on SMEs. Due to the short lifespan of trailers, limiting the obligation to equip vehicles with rear aerodynamic devices to new ones only would not significantly alter this situation.
  - The introduction of compulsory thresholds for checks of HDVs may also have financial impacts on Member States. However, this would depend on the change with respect to current number of checks in Member States. Hence, it is not possible to estimate any cost impacts for this measure.

In addition, a partial cost-benefit analysis was carried out estimating annual costs and benefits of the different policy packages and policy measures, where a quantification was feasible.[85] Obviously the market penetration rate of the different technologies proposed, in terms of rate and timing, is key in this context (see table 10). For the purpose of the present IA and

[84] http://iswim.free.fr/doc/remove_WP4_costbenefit_analysis.pdf.
[85] The assumptions behind the calculations and the methodology used are described in Annex 2.

considering the different state of maturity and costs of the technologies proposed, it is assumed that by 2030, 75% of long distance HGVs will be equipped with aerodynamic rear devices (a better situation than expected in the operational objective OO1) and that 50% of all HGVs will have adopted the new cabin design.

According to IRU, roof-top spoilers on cabins, which were introduced in the 1990s and which are fairly comparable to rear devices in terms of costs and in terms of possible energy efficiency improvements, experienced a rapid uptake and equip currently close to 90% of long-distance trucks. Figures from the USA, where such devices have come into use around 2008 show that uptake has been very quick,with over 10,000 vehicles equipped in 2012[86]. In this context, the assumption of an uptake of 75% of rear devices in 2030 seems plausible. However, a sensitivity analysis with lower penetration rates will be performed in chapter 6.5.

Buses as well as the measure on hydridisation could not be included in the calculations below as figures needed for the calculations were not readily available. Due to the higher cost of investment into a new tractor unit, the new cabin design is expected to reach slightly lower penetration rates than aerodynamic devices. However, based on the average life cycle of a truck (5-6 years), the renewal of a part of the fleet will take place by 2030. The safety benefits of these cabins combined with their fuel benefits is expected to ensure that hauliers will choose this type of cabin when investing in new vehicles, thus leading a high level of uptake.

Table 10: Annual and discounted costs and benefits of individual policy packages and measures for vehicles registred in the EU

	Measures	Benefits (million €)	Costs (million €)
PP 1	Aerodynamic rear devices	1.194/2.826 (fuel saving) 77/157 (climate change mitigation)	327[87] (cost of devices on long distance HGVs)
PP 1 total		***1.271***	***327***
PP 2	Cabin re-designs	1.048/2.124 (fuel saving) 47/95 (climate change mitigation)	
	Compulsory targeted checks	713[88] (avoided infrastructure damage)	7[89] (cost of WIM stations)
PP 2 total		***3.079***	***334***
PP 3	Mandatory aerodynamic rear devices on all HGVs	494/942[90] (additional fuel saving to PP 1) 26/52 (additional climate	1.417 (additional cost of devices to PP 1)

[86] Source: data from aerodynamic device manufacturer ATDynamics.

[87] Assuming an average life time corresponding to that of HGVs being 7 years (source : EU Transport GHG: Routes to 2050, Task Report 9 IV).

[88] Average of range provided in chapter 5.2.1 and assuming 75% compliance.

[89] 250 stations would have to be installed to equip the trans-European road network in order to reach a level of equipment similar to the one of the advanced Member States (eg France), noting that referring to the most advanced countries (e.g. NL) would imply a higher number. With an average individual cost of 150 k€ and a life time 5 years, plus 150-350 k€ for civil works and others (one off cost) (source: French IFSTTAR laboratory and the Belgian Institute BRRC).

[90] Assuming a 100% introduction for long-distance HGVs and no significant fuel saving from short-distance HGVs.

		change mitigation to PP 1)	
	Mandatory on-board weighing devices on all HGVs	190[91] (avoided infrastructure damage additional to PP 2)	2.295[92] (cost of devices)
PP 3 total		***3.789***	***4.046***

Note: Where figures were calculated for 2030 (in black) to take account of expected future developments, these were discounted to 2012 using the standard discount rate of 4% to enable a comparison with the other figures calculated for 2012 (in orange). The value of the 300-500 lives saved by cabin re-designs is not quantified but would add an additional substantial benefit for PP 2.

While acknowledging that the above analysis is only partial and that changing the assumptions made, which obviously are surrrounded by a great deal of uncertainty (notably at the horizon of 2030 e.g. regarding the projections on vehicle stock, on market uptake and on fuel prices), could have an impact on the calculations, it provides nevertheless an indication of some, if not all, of the most significant costs and benefits. Other costs and benefits related to measures, which could not be quantified and which consequently are not part of the above analysis, are not likely to fundamentally change the indications provided. However, a sensitivity analysis is provided in chapter 6.4.

PP 1 would, relative to the baseline, have a benefit-cost ratio well above 1, which is mainly due to the estimated fuel savings. Adding the measures of PP 2 would result in a higher benefit-cost ratio. PP 3 would present additional benefits in terms of mainly fuel savings, but these would be exceeded in the short term by the costs of making aerodynamic devices mandatory, be this for all vehicles or only for the new ones. Moreover, the cost of making on-board weighing devices mandatory would largely exceed their benefits, which would result in a benefit-cost ratio lower than 1. Additionally, in PP 3, SMEs in particular would face a significant financial burden.

- **Coherence**

The proposed policy packages are fairly coherent in terms of environmental, social and economic impacts as shown in the summary table of Chapter 5.4. The only substantial trade-offs identified are for PP 3, for which potentially substantial negative economic impacts were identified for SMEs.

In terms of impacts with regards to the Member States, the countries which will be the most impacted are the ones with the highest level of traffic and the ones with the highest number of registered vehicles. Countries with the highest level of traffic are already the ones with the highest level of pollution and congestion created by road transport, and for these countries, the impacts will be most positive by decreasing pollution, fuel consumption and the wear and tear of motorways, and possibly by reducing road traffic (see also annex 4 for more indications). The impacts on countries with the highest number of registered vehicles will be on the economic profitability of road transport in fair conditions, due to the reduction of loss of time for controls, and to the reduction of illegal profits biasing competition with overloads.

- **Sensitivity analysis**

Despite the fact that the transport sector has shown a considerable interest in aerodynamic devices already available and possible to install within the current limits on maximum weights and dimensions, there may be an uncertainty with regard to the market uptake of aerodynamic

[91] Average of range provided in chapter 5.2.1 and assuming 95% compliance.

[92] Assuming the average price of the range provided in chapter 5.2.1 and an average life time corresponding to that of HGVs being 7 years.

rear devices and cabin re-designs, which may impact the calculations presented in the partial cost-benefit analysis above.

Under current assumptions, however, it can be demonstrated that uptakes of single rear devices and of single cabin re-designs will have cost-benefits ratios higher than 1. Therefore, higher or lower market uptakes than foreseen in PP 1 and in PP 2 will in all cases result in benefit-cost ratios higher than 1. In absolute numbers, lowering the market uptake of aerodynamic rear devices from 75%, as assumed, to 50% (OO1) would reduce the combined benefit of fuel savings and climate change mitigation to € 971 million (compared to € 1,271 million in 2012 as mentioned above). However, given that a lower number of trucks would install the devices, the cost would also decrease to € 218 million (compared to € 327 million in 2012 as mentioned above). Hence, as explained, the benefit-cost ratio of aerodynamic rear devices would remain higher than 1 despite a lower market update than initially assumed.

Altering other assumptions, notably the average annual mileage of an HGV and the fuel price, could on the other hand change the benefit-cost ratios. If average kilometres driven per HGV as well as the fuel price evolved in another way than expected until 2030, and result in lower values than assumed in this IA, this would reduce the benefit-cost ratios. For instance, if the average distance driven by long-distance trucks would decrease from the assumed 98,000 kilometres per year to 75,000 kilometres per year, the fuel saving benefits of rear devices and of cabin re-designs would decrease to € 2,116 million (compared to the amount of € 2,243 million in 2012 mentioned above). Hence, the benefit-cost ratio would also remain higher than 1 in this case. As regards the assumption of the fuel price of € 2.10 per litre in 2030, which is estimated by PRIMES-TREMOVE and which is obviously surrounded by a great deal of uncertainty, it can be demonstrated that applying the current level of fuel prices of approximately € 1.40 per litre, which would be significantly below the estimated 2030 price level, the benefit-cost ratio of rear devices and cabin re-designs would still remain above 1.

o Conclusion - ranking of the options

The table below summarises the impacts identified in sections 5 and 6 of this IA.

Table 11: Comparison of policy packages

	Effectiveness	Efficiency	Coherence	Benefit-cost ratio
PP 0	-	-	-	-
PP 1	Medium	Low costs	No trade-off	>1
PP 2	**High**	**Low costs**	**No trade-offs**	**>1**
PP 3	High	High costs	High trade-off	<1

It can therefore be concluded that PP 2, ensuring a high likelihood of achieving the objectives of the IA at a reasonably low cost and without causing undue trade-offs between environmental, social and economic impacts, should be the preferred option. This conclusion is supported by the partial cost-benefit analysis performed in this IA indicating that PP 2 would result in a benefit-cost ratio higher than one.

- **MONITORING AND EVALUATION**

Regular evaluation of the proposed revision of Directive 96/53/EC will be important in order to assess its effectiveness and efficiency and in order to measure progress against the operational objectives defined above.

The level of attainment of the operational objectives will be monitored in the year the proposed legislation enters into force and regularly afterwards supported by a general provision in the Directive requiring Member States to provide the Commission with relevant statistics as referred to below.

Table 12: Monitoring

Operational objectives	Monitoring
OO1: Achieve a significant share of long-distance trailers equipped with rear aerodynamic devices (75%) and aerodynamic cabins (50%) by 2030	The Commission will gather evidence from statistics from Member States, automotive manufacturers and hauliers associations on the number of trailers equipped with aerodynamic devices
OO2: Achieve a doubling of the use of 45' containers transported as part of a combined/intermodal transport operation: **by 2030, 75 % of the containers transported over more than 300 km inside the EU should use at least two modes of transport**	The Commission will gather evidence from statistics from Member States, shippers and hauliers associations on the use of 45' containers in intermodal transport
OO3: Increase the effectiveness of manual checks (number of infringements / number of checks). Such an increase will improve the reliability of checks and at the same time avoid annually 100, 000 unnecessary checks by 2020	The monitoring will be performed using statistical data that Member States will provide as proposed in Measure 10 of PP 2

Apart from the benchmarks ideintified in the operational objectives here above, the impact on the environment of the vehicles will be monitored by processing data related to :

- infrastructure wear & tear: the number of infringements of the Directive and the level of overweight will be reduced significantly (very small amount of frauds more than 10% above weight limit)
- road safety: the impact of the new designs of cabins will be measured when such new cabins will represent at least 30 % of the fleets of trucks. A monitoring study shall be launched to assess the benefit of the new designs on the safety of other road users.
- environment: when rear flaps start being implemented on the market, a study will assess the real monetary benefits in the reduction of fuel consumption of the equiped vehicles during their operational life cycle. The results of the study will be the best incentives to convince hauliers to equip their fleets. The Commission will also carefully check the tests performed by the manufacturers of tractors with their new aerodynamic vehicles, when these designs enter the market, and gather the results from all companies to assess the real benefits obtained from the revised Directive.

The evaluation and monitoring by the Commission will be carried out with regular intervals, at least every five years, and in the case of OO3 depending on the provisison of the necessary statistical data from the Member States. The Commission will report the findings of the evaluation and the monitoring to the European Parliament and to the Council.

ANNEX 1

Summary of the results of the public consultation on the revision of Directive 96/53/EC (maximum weights and dimensions of trucks and buses) and of the related meetings with stakeholder representatives

October 2012

Participation in the public consultation

The public consultation was launched in December 2011 and closed on 27 February 2012. More than 1,000 responses were received. Half of these came from professional or administrative organisations, the other half from private citizens.

Most professional respondents came from road transport-related sectors (manufacturers of trucks, trailers or buses, infrastructure operators, transport operators, providers of electronic devices and other equipment (tyres for instance), and associations of them). Professional organisations from other modes of transport also replied (rail, combined transport, inland waterways, maritime), as well as other sectors of activities (agriculture, forest, petroleum). Administrations of some Member State replied, as did Switzerland, Norway and the American Chamber of Commerce. Different non-profit organisations like road safety associations and environmental ones also participated.

Most answers of citizens were split in a small number of identical responses, each group coming usually from one single country, leading to the conclusion that members of the same association have separately sent a predefined answer. Due to this situation, statistics on citizens responses are meaningless, and will not be mentioned in this document.

The results of a series of meetings convened by DG MOVE with manufacturers of trucks and buses and operators of these sectors, with road safety organisations, enforcement associations and representatives of intermodal transport (held between March and June 2012) have also been inserted.

The results of the public consultation have not yet been published. The following sections summarise the responses, following the questions under consideration in the process of revision of Directive 96/53/EC.

I. Energy and CO_2 efficiency

- Does the Directive limit innovations for improving fuel consumption and energy efficiency?

  A vast majority of stakeholders agree that Directive 96/53/EC limits innovations that could improve fuel consumption and energy efficiency.

  Hauliers and manufacturers of trucks and trailers underline the potential to improve aerodynamics of both the cabin and trailer by increasing the permissible dimensions. For that purpose, they highlighted during the focused meetings the concept of performance-based standards governing the designs of new vehicles, to be preferred to fixed limits written in stone for 20 years.

  Hauliers also suggest that innovations like longer and heavier trucks would allow a decrease in the number of trucks travelling on the roads, causing less congestion, lower global fuel consumption and less CO_2 emissions. But representatives of other modes of

transport consider that due to the current tendency in increase of road transport, there would soon be the same number of trucks on the roads, but heavier and longer. They agree that increasing dimensions could be useful to improve aerodynamics but pleaded against any increase in the loading capacity, and pointed out the necessity to assess road safety risks.

- Efficiency of the aerodynamic shape of HGV to save fuel and energy
  80 % of the professional stakeholders recognized improvements in aerodynamics as a means to save fuel and decrease CO_2 emissions. Some stakeholders also proposed complementary solutions like:
  - improvement of tyres
  - a policy increasing the modal shift from road to rail and waterways
  - the promotion of eco-driving as an important instrument to increase efficiency of vehicles, especially for the heavier ones.
  - some private stakeholders call for a Europe-wide limit of 80 km/h as maximum speed for trucks and buses, as is already the case in some Member States.

  Many possible devices have been identified by the participants to the consultation.

  Among road professionals, aerodynamic tails and side skirts were most often cited. All stakeholders agreed that these two devices have the highest positive impact on fuel and carbon efficiency.

  Concerning side skirts, if 58 % of professional stakeholders acknowledge their positive impact on aerodynamic performances, they appear fragile and their use is so far limited. These devices can already be fitted within the maximum dimensions foreseen by the Directive, and are therefore out of the scope of the revision process.

  Some hauliers advocate for an increase of the width of the vehicle by 5 cm in order to fit side skirts more easily on every truck.

- Aerodynamic flaps at the rear of the trailer provide a high level of efficiency. They need to be retractable (foldable), preferably automatically from the cabin, and made in suppler materials. The majority of stakeholders from the domains infrastructure, road safety and intermodality expressing a view said that there would be no impact. They represented around 30 % of professional respondents. 40 % of these professional respondents said they were not able to give an opinion. The remaining 30 % were split between small positive or small negative impacts.
  The picture below gives an idea of a truck equipped with both side skirts and rear flaps.

The information gathered on the rear flaps can be summarized as follows:

- there was no opposition to this equipment from any stakeholder group;
- they would fit to the great majority of existing rail wagons when folded;
- at a speed of 80 km/h, flaps would reduce fuel cnsumption by 6-7% and half as much at speeds of 50 km/h;
- cost: around € 3,000, installation included;
- there is a risk that the equipment is damaged during loading / unloading operations;
- road safety and enforcement issues need to be considered, like for instance lighting at night, license plate video surveillance;
- hauliers and manufacturers of trailers are immediately ready to adapt their products as soon as the Directive will be revised.

The rail sector expressed concerns of a possible negative impact on modal split : increasing the dimensions of trucks and trailers could prevent loading them on some wagons. It appears however that the foreseen add-ons are compatible with a vast majority of the existing rolling stock of wagons, when folded.

- Boat tail shaping of the rear of the trailer.
  Some studies or trials have been performed with a boat tail configuration. They have shown some difficulties with loading / unloading as the rear entrance to load the trailer becomes too small. A practical boat tail would hence require an increase in the maximum height of the vehicle, should the size of the back door be kept constant. Respondents did not have a complete view on this solution, which would need further studies. Expressing the load in terms of pallets, keeping the same load would probably lead to an extension of the trailer by at least 2 metres.

- Aerodynamics for the tractor
  75 % of the professional stakeholders which expressed an opinion considered that the redesign of the cabin would have a positive effect on the aerodynamic performances of the vehicle.

  But this issue is more complicated than the previous ones. One study suggests that an increase of the cabin by 80 to 100 cm would enhance the aerodynamics of the truck generating a saving of 3 to 4 % of fuel consumption whereas an additional length beyond 1 meter would not provide additional benefits (according to a majority of manufacturers). Some other manufacturers have however suggested that an additional length beyond 1 m would also provide additional benefits in terms of aerodynamic

performance. It has also been suggested that an extension could be used for a complete redesign of the cabin, allowing to include new mandatory features for safety, to improve the comfort of the driver, and to improve the field of vision of the driver to avoid accidents with vulnerable users like bikers or pedestrians in urban areas. The opinion expressed is that it could allow saving around 300 to 500 lives all over Europe. The figures of the European Cyclist Federation indicate much higher figures: 3,200 to 3,800 lives may be saved annually.

Further studies and trials are needed to reach the best possible design, and a time period of up to 10 years has been requested by manufacturers of tractors for this kind of adaptation. This period would also allow them recouping current investments in the last generation of trucks complying with the current specifications of Directive 96/53/EC.

This could lead to designs like the one illustrated here under

Source: FKA Report 104190, Aachen 2011.

Such a new design of the cabin could lead to a complete reshaping of concepts, such as a driver seated in the middle of the cabin to have a symmetrical field of vision. The impact of such a move would touch many functionalities. As an example, a driver seated in the middle of the truck could not pay tolls manually.

Manufacturers and hauliers agreed that providing performance-based standards could be a useful means of determining cabin design, rather than fixing definite figures in the text of the Directive.

Hauliers considered that the Directive should allow the use of aerodynamic equipment, not make their use mandatory. The economic viability of these equipment has not been fully demonstrated (comparison of the initial investment with the savings on fuel consumption in a timeframe of 2 to 3 years which is the requested time for return on investment in the profession). Furthermore, the range of magnitude of the investment may not be affordable for some SMEs, especially in times of economic crisis.

- Improvement of buses and their aerodynamics

  Improvement of buses and their aerodynamics has a similar justification as the one promoting aerodynamics for trucks (fuel reduction: 2 to 5%). Aerodynamics can be improved but the impact is more limited for urban transport due to lower speeds. There is no need to revise the Directive as the improvements such as rounding body corners can be done under the existing dimensions.

- Derogation for electric batteries

There was no general agreement on allowing derogations for electric batteries. Only 40% of professional stakeholders were in favour.

A majority of stakeholders, mainly manufacturers, operators and public administrations, however agreed on increasing the weight of the trucks for electrification of urban trucks and hybridisation of interurban ones. Many vehicle manufacturers stated that a derogation was required also for vehicles with alternative fuels (methane, LPG) that were now penalised, as electrification would be limited to vehicles used in urban zones.

Actors who disagreed, mainly environmental associations, stated that batteries for heavy vehicles were not the most efficient instrument to cut down CO_2 emissions, and called for an increased modal shift from road to other modes of transport.

II. Intermodality and innovation in transport needs

- Allowing 45' containers

  45' containers represent some 2% of the world wide stock of containers, mainly used between the US and the Far East over the Pacific Ocean. 20 % of these containers reach European ports and can continue on roads or rail in Europe. They amount currently in Europe to 88,000 containers of 45'. An additional group of 30,000 containers have the same length of 45', but a larger width and are called pallet-wide containers. The question of pallet-wide containers should be decoupled from the question of 45' containers.

  Most actors of all types agreed on the generalisation of 45 ' containers for the two following reasons :

  - this would favour co-modality and combined transport,

  - the required increase in the length of the vehicle is very limited (12 to 15 cm).

  However, many stakeholders considered that allowing 45' containers would required an extension of the maximal weight to 44 tonnes, as 45' containers will be heavier than the common 40' ones. Without this increase of the maximum allowed weight, an increase in size would have no sense.

  Some actors (shippers and hauliers) pleaded for a general acceptance of containers of 48', and even 53' containers, meaning an increase of the length of about 1 m (48') or 2.5 m (53'), and an extension of the maximal weight to 60 tonnes.

  Those in favour of allowing 45' containers stated that these containers have the advantage to make transport more efficient and diminish the number of trucks as well as CO_2 emissions and congestion. That would also eliminate some time-consuming administrative burdens (for those asking regularly permission to use 45' containers).

  Restrictions suggested by the questionnaire (geographical, time restrictions and intermodal use) were not welcome by the haulage industry (as the legislation was already complex). Actors who considered those restrictions necessary chose mainly a limitation to multimodal transport, and another limitation on certain itineraries, for reasons of safety or suitability of infrastructure. 39 % of professional stakeholders would prefer a limitation to multimodal transport while 31 % would open the derogation for all road transport operations.

  Impacts of the use of 45' containers (non-pallet-wide)

  - *Infrastructure*: According to most hauliers, the impact on infrastructure would be very limited, even if the EU allowed an increase in the maximum weight to 44 tonnes. For combined transport companies and infrastructure organisations, the impact would mainly concern roads and urban infrastructure. This was due to the very small increase in the length of the vehicles (12 to 15 cm), and the fact that interurban infrastructures were already designed for heavier trucks than 40 tonnes.
  - *Road safety*: most stakeholders of any type saw no negative impact (only 12 to 15 cm change of the vehicle length). A Danish study demonstrates that EMS and other longer trucks even increase road safety. Some actors stressed however difficulties to manage a heavier vehicle (44 tonnes).
  - *Co-modality:* while most actors of co-modality were in favour of containers of 45', as they considered that this would increase co-modality (45' containers would fit well on rail wagons), some stakeholders considered on the contrary that a liberalisation of the Directive on this matter would reverse the modal shift, as

combined transport would lose its advantages to transport by road. They also claimed that it could facilitate a general movement to increase the loading capacity through the use of larger containers.

- Pallet wide containers
  They were heavily supported by the haulage industry as well as by the combined transport associations, for reasons of economies of scale.

  The considerations against pallet-wide containers were that as pallet-wide containers were not standardised, some pallet-wide containers would not fit on wagons, and allowing them for road transport would reverse the modal shift in favour of road.

- Weight and dimensions of buses:
  There was a general consensus that an increase was needed in the weight of two-axle buses from 18 to 19.5 tonnes. This would allow covering the extra weight of safety and on-board equipment without affecting weight distribution or overloading axles. It was underlined that the Euro VI class for a coach meant 200 kg additional weight. One country (France) already allows in its national legislation an increase of the maximum weight by 500 kg for safety purposes.

III. Controls, checks and enforcement

- Hauliers, NGOs and private respondents considered that the current situation was not satisfactory. The main criticisms were the following :
  - Checks are not efficient
  - Checks are not sufficient in number
  - Procedures are not harmonised
  - Sanctions are not harmonised.
- There was a broad consensus on the need to reduce the cost of checks, for instance with a generalisation of automatic systems like weigh-in-motion (WIM) or on-board systems to measure the weight of the truck and the weight per axle. In this case, the measurements should be available through another communication device using for instance DSRC.
- Money collected from fines could be used for projects aiming at improving road transport, or could help in the deployment of weigh-in-motion systems.
- Excessive loading was recognized as the major infringement and as a way of distorting competition. The UK FTA for instance protested against the 44 % of foreign trucks which were recorded as overloaded on UK territory. The second major infringement was related to the maximum height of trucks.
- Harmonising checks and controls should therefore be a priority, as well as harmonising sanctions when infringing rules. 52 % of professional stakeholders suggested harmonising the procedures, 56 % the sanctions. Harmonisation would avoid discrimination of hauliers depending on different national legislation, or on their nationality. There was agreement on the fact that this harmonisation would need to be done at European level.
- The IRU and its national members requested that hauliers and shippers share the legal responsibility in case of overweight, especially for containers, as hauliers would not necessarily know the weight of the containers they transport

IV. Legal clarifications of derogations for cross-border traffic of longer trucks (EMS)

Positions varied along the following lines:

- Hauliers associations and truck manufacturers pleaded for a generalisation of EMS all over Europe with no restriction, highlighting savings in fuel consumption and CO_2

emissions as three trucks would be replaced by two. They claim that studies and experiences from the current use in the Netherlands, Sweden, Denmark and Finland showed that there was no negative impact on road safety, modal split or traffic management. The economic efficiency of the haulage industry and of the overall economy would improve. They accepted that the use of EMS should be limited to suitable roads only.

- Rail and waterways stakeholders and environmental NGOs were against the liberalisation of the cross-border movement of heavier and longer trucks considering that due to the current increase of transport demand in Europe, a sound policy would be to shift all increase to other modes of transport. Allowing EMS in cross-border traffic would reverse the modal shift in favour of road.
- Clarification of the provisions on cross-border transport of longer trucks
    - 69 % of the professional stakeholders considered that, in the interpretation of the Directive, problems would arise concerning cross-border transport operations mainly of transported cars, refrigerated goods, logging and forestry-related transport, and also chemicals and other dangerous goods. Referring to some case studies (FR/BE/NL; FR/ES; SE/FI/DK), they drew attention to:
        - the lack of legal clarity with regard to the use of 44 tonne trucks or EMS between two Member States that allow these trucks on their national territory,
        - the differences between national standards on weight and dimensions leading to a distortion of competition between companies of different Member States.
    - Art. 4(3), 4(4) and 4(5) of the Directive (derogations) should be clarified. Positions among stakeholders varied: While the haulage industry called for a lifting of all restrictions between consenting neighbouring countries, those with reservations (mainly environmental NGOs and rail associations) considered that any tolerance on the cross-border use of heavier and longer trucks was against the Directive.
    - Concerning Art. 4(5) of the Directive (derogation for trials), the same opponents said that trials should not be allowed on a scale and time period which created a de facto authorisation. The haulage industry considered however that in accordance with the subsidiarity principle, Member States were free to launch national trials appropriate to their circumstances.
- Role of the European Commission
  The EU should monitor the implementation of rules and promote innovation, updating legislation accordingly. Another important role of the European Commission would be to provide a common interpretation of the Directive and to monitor the actions of Member States, also using guidelines.

ANNEX 2

Methodology applied in partial cost-benefit analysis

The partial cost-benefit analysis presented in Chapter 6.4, calculated for 2030 with a view to account for expected developments of key parameters, relies on several assumptions and calculations, which will be explained in more detail in this annex.

Background

Firstly, as a basis for the calculation of the benefits in terms of fuel savings and climate change mitigation, the following table, presented in Chapter 5.1.1, was prepared.

Estimated fuel saving and corresponding climate change mitigation (2030)

		HGVs (>3.5 tonnes)			
		Market penetration			
Measures	**EU27 Stock**	**25%**	**50%**	**75%**	**100%**
Rear devices (6% fuel saving)	1,017,106	449	897	1,346	1,794
Cabin re-design (4.25% fuel saving)	4,068,425	506	1,012	1,517	2,023
Hybridisation (25% fuel saving)	5,815,675	4,253	8,505	12,758	17,011
Total fuel saving (million litres)		*5,207*	*10,414*	*15,621*	*20,828*
Total fuel saving (million Euro)		*10,935*	*21,869*	*32,804*	*43,739*
Carbon reduction (1000 tonnes)		**13,538**	**27,076**	**40,615**	**54,153**
Climate change mitigation (million Euro)		**487**	**975**	**1,462**	**1,950**

The table initially estimates fuel savings (in million litres) at different market penetration rates (25%, 50%, 75% and 100%) of rear aerodynamic devices, longer, more aerodynamic cabins and of hybrid trucks. We applied the average fuel saving potentials of these measures as described in the literature. The assumptions on the EU27 vehicle stocks applied in these calculations are derived from the PRIMES-TREMOVE reference scenario:

- rear devices: the potential stock of vehicles are assumed to be HGVs above 20 tonnes (4,068,425) driving long distance (25%), i.e. 1.017.106 vehicles
- cabin designs: the potential stock of vehicles are assumed to be HGVs above 20 tonnes[93] driving long distances (25%), i.e. 1.017.106 vehicles
- hybridisation: the potential stock of vehicles is assumed to be HGVs below 20 tonnes (5,812,675), which generally drive shorter distances.

Moreover, in order to calculate the fuel savings (in million litres) for the potential stock of HGVs at different market pentration rates, it was assumed, using statictics from Eurostat and evidence from France, Germany and the UK, that average HGVs drive between 39,000 km/year (short distance) and 98,000 km/year (long distance), and that HGVs on average consume 30 litres fuel per 100 km.

The total fuel saving (in million €) was calculated multiplying the resulting fuel savings (in litres) by the forecasted price of fuel in 2030 of € 2.10 / litre from the the PRIMES-TREMOVE reference scenario.

The carbon reduction potential (in tonnes) was calculated multiplying the total fuel saving (in litres) by the carbon content of diesel (2.6 kg CO_2 per litre diesel), and the benefit in terms of the lower

[93] Unlike for the rear aerodynamic devices, the impacts of reviewed cabin design is not limited to inter-urban transport: such trucks are also safer for the vulnerable users in urban environment. However the fuel savings will result mainly from long-distance high-speed trips.

contribution to climate change (in €) was calculated multiplying the total carbon reduction potential (in tonnes) by the estimated price of carbon in 2030 of € 36 / tonne from the DG Clima IA on a Roadmap for moving to a competitive low carbon economy in 2050.

The partial cost-benefit analysis, presented in the table below, was performed assuming a market penetration rate of 75% for rear aerodynamic devices and 50% for cabin re-designs. Due to a lack of vehicle stock figures concerning buses and concerning hybrid vehicles, such vehicles could not be taken into account in the cost-benefit analysis.

Benefits

Benefits in terms of fuel savings (in Euro) for rear aerodynamic devices and for cabin re-designs were calculated using the above mentioned fuel savings (in litres) for the assumed market penetration rates multiplied by the assumed fuel price of 2.10 € per litre in 2030. Correspondingly, benefits in terms of reduced contribution to climate change were calculated by multiplying the fuel savings (in litres) by the estimated price of carbon in 2030 of € 36 / tonne.

Benefits in terms of avoided infrastructure damage caused by overloaded HGVs were calculated applying an estimated average share of 3.8%[94] of total maintenance costs in the EU (€ 25 billion) caused by these HGVs. Moreover, in PP 2 it was assumed that the introduction of WIM (Weigh-in-Motion) stations would lead to a compliance of 75% and in PP 3 that the introduction of mandatory on-board weighing devices on all HGVs would lead to a compliance of 95%, the remaining 5% of non-compliance being due to rogue companies who would continue to try their luck in the hope of not being caught. Currently, only sparse data is available on current compliance rates but evidence from the Netherlands point to a hit-rate of around 50%, implying that 50% of the vehicles stopped using manual selection were overloaded. This number, however, may vary a lot between Member States depending on levels of enforcement.

Lastly, benefits in terms of lives saved by allowing an extension for cabin re-designs in PP 2 would, as mentioned in the IA, result in an estimated 300-500 lives saved per year. The corresponding economic benefit would be significant but due to uncertainty of the number and to where these lives would be saved, this benefit was not included in the partial cost-benefit analysis.

Costs

The costs considered in the partial benefit analysis include costs of installing rear devices on the HGVs, costs of WIM (Weigh-in-Motion) stations and costs of on-board weighing devices.

Costs of rear devices are calculated assuming a cost per rear device of € 3,000 with an average lifetime corresponding to an HGV, i.e. 7 years, multiplied by the relevant market penetration rates, i.e. 75% in PP 1, and on all HGVs above 20 tonnes in PP 3, according to which rear devices would become mandatory.

The cost of WIM stations is calculated using expert knowledge estimating the additional number of stations needed to cover the EU TEN-T road network, which would amount to approximately 250 stations.[95] The average cost of a WIM station is ranges from € 50,000 to € 70,000, with an average lifetime of 7 years, to which should be added approximately € 15,000 in annual maintenance and data calibration costs per station. Moreover, a one-off average amount of € 75,000 in installation costs per station should be added.

Lastly, the cost of on-board weighing devices, proposed as a mandatory measure in PP 3, is calculated using an average cost of on-board devices of € 8,000, with an average lifetime of 7 years, applied to all HGVs above 20 tonnes.

Discounting of figures calculated for 2030

All numbers calculated for 2030 in the partial cost-benefit analysis were discounted to 2012 using the standard discount rate of 4% to enable comparison with the figures calculated for 2012 (in orange).

[94] Source: International Society on Weigh-In-Motion (ISWIM).
[95] Source (for all figures in this paragraph): International Society on Weigh-In-Motion (ISWIM)

Annual and discounted costs and benefits of individual policy packages and measures. Figures presented in black are for 2030 and discounted figures for 2012 in orange.

	Measures	Benefits (million €)	Costs (million €)
PP 1	Aerodynamic rear devices	1.194/2.826 (fuel saving) 77/157 (climate change mitigation)	327[96] (cost of devices on long distance HGVs)
PP 1 total		***1.271***	***327***
PP 2	Cabin re-designs	1.048/2.124 (fuel saving) 47/95 (climate change mitigation)	
	Compulsory targeted checks	713[97] (avoided infrastructure damage)	7[98] (cost of WIM stations)
PP 2 total		***3.079***	***334***
PP 3	Mandatory aerodynamic rear devices on all HGVs	494/942[99] (additional fuel saving to PP 1) 26/52 (additional climate change mitigation to PP 1)	1.417 (additional cost of devices to PP 1)
	Mandatory on-board weighing devices on all HGVs	190[100] (avoided infrastructure damage additional to PP 2)	2.295[101] (cost of devices)
PP 3 total		***3.789***	***4.046***

[96] Assuming an average life time corresponding to that of HGVs being 7 years (source : EU Transport GHG: Routes to 2050, Task Report 9 IV).

[97] Average of range provided in chapter 5.2.1 and assuming 75% compliance.

[98] 250 stations would have to be installed to equip the trans-European road network in order to reach a level of equipment similar to the one of the advanced Member States (eg France), noting that reaching the level of the most advanced countries (e.g. NL) would imply a higher number. With an average individual cost of 150 k€ and a life time of 5 years, plus 150-350 k€ for civil works and others (one-off cost) (source: French IFSTTAR laboratory and the Belgian Institute BRRC).

[99] Assuming a 100% introduction for long-distance HGVs and no significant fuel saving from short-distance HGVs.

[100] Average of range provided in chapter 5.2.1 and assuming 95% compliance.

[101] Assuming the average price of the range provided in chapter 5.2.1 and an average life time corresponding to that of HGVs being 7 years.

ANNEX 3

SIIM KALLAS
VICE-PRESIDENT OF THE EUROPEAN COMMISSION

Brussels, 13. 06. 2012
KJF/bk D(2012)

Mr Brian SIMPSON
Chairman of the Transport and Tourism Committee
Office: ASP13G306
60, rue Wiertz
BE-1047 Brussels

Dear Mr. Simpson,

As was discussed in the meeting of the TRAN Committee of 26 March, I have been carefully considering the reading of certain points of Directive 96/53/EC[1] and I would like to inform you of my conclusions, in the light of the advice I have received. Although you are aware that the definitive interpretation of EU law remains with the Court of Justice of the European Union, I believe that it is important to first describe our understanding of the role of the Directive in the structure of European transport policy in order to explain our interpretation and its practical implications.

The first Directive on weights and dimensions of road vehicles, Council Directive 85/3/EEC, represented a first step in harmonising the diverging rules in this field in Member States. By laying down maximum standards, the Directive broke new ground, allowing hauliers who had up until then been held up at borders due to diverging sets of legislation to circulate throughout the Community, if their vehicles complied with the weights and dimensions limits in the Directive. In this sense this Directive is truly a cornerstone piece of legislation, key to ensuring free circulation and the setting up of the internal market for road transport.

Under the Directive, Member States could choose to exceed these standards if the infrastructure and market conditions on their territory allowed this. Several Member States chose to do so, without the Directive stipulating the geographical scope of such deviations. The Directive thus prevented Member States from rejecting vehicles in international transport, as long as they complied with the (maximum) standards. The Directive did not, however, prevent Member States from accepting vehicles which exceed these standards on their territory. This is still reflected in Art 3 which has remained in the today's Directive and which does not prevent Member States from accepting the modular concept on their territory.

With the opening up of internal borders in 1993 and the possibility for hauliers to carry out domestic transport operations in other Member States, the Directive was replaced and its key provisions were maintained and supplemented. Not only should the legislation ensure that hauliers could circulate freely from one country to another, it should also guarantee that when carrying out national transport operations abroad, they are operating

[1] COUNCIL DIRECTIVE 96/53/EC of 25 July 1996 laying down for certain road vehicles circulating within the Community the maximum authorized dimensions in national and international traffic and the maximum authorized weights in international traffic (OJ L 235, 17.9.1996, p.59), as amended by Directive 2002/7/EC of the European Parliament and of the Council of 18 February 2002 (OJ L 67, 9.3.2002, p. 47)

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on equal footing with local operators benefitting from the higher limits referred to above. The legislator therefore decided to forbid deviation from the standards for national transport in order to preserve fair competition, in particular in the newly opened cabotage market. The Commission's proposal was specifically amended by the legislator to ensure that the standards in the Directive were impartially applied in national transport. Derogations were however agreed for longer vehicles in cases which did not affect fair competition and provided that they were applied without discrimination.

The derogation related to the modular concept was a result of the accession to the European Union of Finland and Sweden, where these vehicles were already in use. With the concept applicable to any type of vehicle, irrespective of the country of registration the legislator considered that the modular concept does not significantly affect international competition. The driving principle behind this derogation, once again, is fair competition in a free market.

The notion of "national transport operation" was introduced in the derogation foreseen for the modular concept to mirror the requirement to comply with these standards in national transport. This does not rule out a situation where hauliers could benefit from similar derogations in two bordering countries, nor does it create a legally binding situation as regards international transport.

It therefore appears that the aim of the Directive is not to prevent the derogations laid out in Art 4(3), 4(4) and 4(5) from applying to cross-border traffic, as long as the Member States involved apply these derogations on their own territories and do so without discrimination to all hauliers. It must also be clear that these derogations should not distort international competition in the transport market, which is the key principle behind this piece of legislation. Finally these derogations should be applied reasonably so that their use does not lead to an exceptional practice becoming the norm, thus contravening the driving principles of the Directive.

Thus under Art 4(3), inter-member state journeys with indivisible loads or vehicles intended to carry an indivisible load are permitted, subject to the grant of a special permit delivered without discrimination by each Member State concerned. These permits should be mutually compatible and should remain in line with the principles underlying the Directive, including the principles of non-discrimination and fair competition. It implies notably that the conditions imposed are sufficiently transparent for all users, including those from other Member States.

As described above, Art 4(4) is an exception to Art 4(1) which prescribes only which vehicles may be allowed for national transport. A key element is to ensure fair competition between national operators and operators of other Member States when carrying out national transport operations. National transport operations are to be understood as operations from one point to another in a Member State's territory. They may therefore cover transport from a point in the territory of a Member State to the border. Neither this paragraph, nor Article 3, nor any other provisions of the Directive addresses the issue of the border crossing. However, a transport authorised from one point to the border within the territory of a Member State may be followed by a transport also authorised from the same border point to another point within the territory of another Member State. It follows from the economic and internal market objectives that such a transport operation across the border should not be prohibited between the two Member States concerned. It remains that conditions must be respected to ensure the compatibility of such an operation with all the objectives of the Directive and in particular the

condition that the derogation of Art 4(4) must not significantly affect international competition. These conditions could reasonably be regarded as satisfied if a cross border use remained within two member states where the existing infrastructure and safety requirements allow it. A last important condition is that these authorisations should be granted to hauliers without discrimination.

Similarly, trials under Art 4(5) could involve more than one member state, and include journeys between those Member States, provided the trial is still "local" – concerning for example a cross border region.

This is, in my view, the interpretation which is the most consistent with the text of the Directive and the initial ambition of the legislator. A more restrictive reading would lead to hauliers uncoupling their vehicles at a border to reattach them a few meters later. Such an interpretation would amount to reinstating artificial obstacles at borders in contradiction with both past and current policy aims. The interpretation set out above preserves the intention of the legislator whilst avoiding manifest absurdity in the application of the Directive.

I hope that this letter clarifies the uncertainties which may have existed regarding the application of the Directive and the approach that I intend to follow with regard to its implementation .

I consider this approach to be both legally sound (though I accept the Directive is not completely unambiguous), and also reasonable in policy terms. It achieves an appropriate balance between on the one hand the right of Member States under subsidiarity to determine transport solutions appropriate to their local circumstances and on the other the need for such national policies not to distort the internal market. I am though fully aware that this is a controversial and emotive issue. However the revision of Directive 96/53 which I expect the Commission to propose in late 2012 (addressing a number of more technical points such as aerodynamic adaptations) will provide an opportunity for the legislator to review the issue of cross border use of longer trucks.

Yours sincerely,

Siim KALLAS

ANNEX 4:

Impacts with regards to the Member States in relation to traffic, vehicles and infrastructure

Road transport performance 2010, by type of transport (corrected for territoriality)

	2010			
	National	international (incl. cross trade)	Cabotage	Total
EU-27	**1,170,376**	**533,720**	**20,852**	**1,724,948**
Belgium	21,345	26,673	1,217	49,235
Bulgaria	6,146	2,453	2	8,601
Czech Republic	14,761	24,137	170	39,069
Denmark	10,574	5,703	406	16,683
Germany	243,606	143,763	6,565	393,933
Estonia	1,400	778	3	2,181
Ireland	7,896	1,432	178	9,507
Greece	24,954	2,424	212	27,590
Spain	146,190	40,256	656	187,102
France	164,343	99,691	6,345	270,380
Italy	149,243	36,062	1,474	186,779
Cyprus	1,067	21	0	1,088
Latvia	2,490	1,431	20	3,941
Lithuania	2,272	3,055	14	5,341
Luxembourg	574	1,767	15	2,357
Hungary	11,243	10,460	21	21,724
Netherlands	34,301	21,294	539	56,134
Austria	13,352	24,476	329	38,157
Poland	86,150	41,789	181	128,119
Portugal	12,853	5,749	55	18,657
Romania	12,094	4,484	31	16,609
Slovenia	2,267	4,545	4	6,816
Slovakia	5,156	6,587	34	11,777
Finland	25,157	1,707	83	26,947
Sweden	29,987	9,143	1,051	40,181
United Kingdom	140,955	13,836	1,247	156,038

Source: Eurostat

Stock of registered goods vehicles

	2010	change 09/10 %
EU27	***34,092.5***	***0.8***
EU15	***28,232.3***	***0.4***
EU12	**5,860.3**	**2.5**
BE	737.5	1.9
BG	333.5	4.9
CZ	598.0	-0.6
DK	485.1	-4.5
DE	2,619.4	2.5
EE	81.2	0.1
IE	327.1	-4.9
EL	1,318.8	1.3
ES	5,303.5	-0.7
FR	*5,239.4*	*0.0*
IT	4640.4	1.2
CY	120.7	-2.7
LV	71.6	-40.6
LT	133.9	-8.5
LU	35.6	2.6
HU	464.9	-0.4
MT	47.6	0.7
NL	1,004.0	-1.3
AT	396.8	2.3
PL	2,981.6	6.6
PT	1,337.0	0.0
RO	667.2	0.8
SI	84.1	0.6
SK	276.0	2.5
FI	464.4	4.6
SE	526.4	2.3
UK	3,796.9	0.4

Source: EU transport in figures 2012

Length of road infrastructure (2009)

	Motorways	Main or national roads	Secondary or regional roads	Other roads*
BE	1,763	12,760	1,349	138,000
BG	418	2,975	16,044	
CZ	729	6,198	48,791	74,919
DK	1,130	2,707	69,737	
DE	12,813	39,887	178,269	
EE	100	3,893	12,427	41,911
IE	663	4,780	11,631	78,958
EL	*1,103*	10,189	30,864	75,600
ES	14,021	11,612	139,833	*501,053*
FR	11,163	9,768	377,986	642,256
IT	6,661	19,375	154,513	
CY	257	2,136	2,834	4,203
LV		1,653	5,327	58,668
LT	309	6,358	14,591	50,680
LU	152	837	1,891	
HU	1,273	6,802	23,303	166,142
MT		184	665	1,379
NL	2,631	2,445	7,836	123,914
AT	1,696	10,003	23,653	88,666
PL	849	17,928	28,403	221,826
PT	2,705	5,976	4,431	
RO	321	16,182	65,210	
SI	747	911	5,117	32,225
SK	391	3,496	14,050	25,942
FI	765	12,563	13,537	51,295
SE	1,891	13,462	83,131	122,378
UK	3,674	49,040	122,542	244,340

Source: EU transport in figures 2012