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**COMMISSION STAFF WORKING DOCUMENT**

**Report on the implementation of the amendments to Directive 96/53/EC introduced by  
Directive (EU) 719/2015**

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## INTRODUCTION

This report responds to article 10j of Directive 96/53/EC<sup>1</sup> (i.e. the Weights and Dimensions Directive or the WDD), according to which the Commission shall submit, as appropriate, a report to the European Parliament and the Council on the implementation of the amendments to Council Directive 96/53/EC introduced by Directive (EU) 2015/719 of the European Parliament and of the Council, including taking into consideration specific characteristics of certain market segments.

The objective of this report is twofold:

- To assess the implementation of the amendments introduced by Directive (EU) 2015/719;
- To assess the characteristics of certain transport market segments for which weights and dimensions of vehicles are particularly relevant.

The Weights and Dimensions Directive was due to be transposed by Member States by 7 May 2017. Thus, the assessment covers a relatively short implementation period between mid-2017 and end of 2021.

This report presents the Commission findings of the impacts of the European legal framework in five market segments: high capacity vehicles, transport of indivisible loads, vehicles carriers, military transport and vehicles with special equipment.

To draw up this report, the Commission has taken into account the findings of the supporting “Study on Implementation of the Weights and Dimensions Directive<sup>2</sup>” (hereinafter referred as “the supporting study”), complemented by additional research and consultations with relevant stakeholders.

## ASSESSMENT OF THE IMPLEMENTATION OF THE AMENDMENTS INTRODUCED BY DIRECTIVE (EU) 2015/719

### 1.1. GENERAL BACKGROUND

The Weights and Dimensions Directive sets standards for dimensions of heavy-duty vehicles (HDV) used in national and international commercial transport and the standards for weights of HDVs used in international commercial transport.

The WDD is the recast directive replacing Council Directives 85/3/EEC<sup>3</sup> and 86/364/EEC<sup>4</sup> which aimed at ensuring a level playing field in the internal road transport market and the free circulation of commercial heavy-duty vehicles between Member States. The WDD

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<sup>1</sup> 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. 59–75). Consolidated version at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A01996L0053-20190814>

<sup>2</sup> Study on Implementation of the Weights and Dimensions Directive, COWI and TRT, August 2021.

<sup>3</sup> Council Directive 85/3/EEC of 19 December 1984 on the weights, dimensions and certain other technical characteristics of certain road vehicles (OJ L 2, 3.1.1985, p. 14–18).

<sup>4</sup> Council Directive 86/364/EEC of 24 July 1968 relating to proof of compliance of vehicles with Directive 85/3/EEC on the weights, dimensions and certain other technical characteristics of certain road vehicles (OJ L 221, 7.8.1986, p. 48-50).

harmonised the maximum weights and dimensions of HDVs used in road transport, providing the right balance between the economic and fair competition objectives and the protection of road safety and road infrastructure.

The WDD was amended in 2002, 2015 and 2019 to extend its rules to the heavy-duty vehicles used for the transport of passengers, to introduce new measures to improve road safety and the working conditions of HDV drivers (namely, safer and more spacious cabs) and to reduce greenhouse gas emissions from road transport (e.g. by providing for more aerodynamic trucks and specific provisions for alternatively-fuelled and zero-emission vehicles) contributing to the achievement of the EU climate and energy targets.

In particular, the amendment of 2002<sup>5</sup> harmonised the maximum authorised dimensions of buses in national and international traffic to enable their free circulation within the EU and ensure that cabotage operations for passenger transport worked efficiently.

The evolving market, emerging technological developments and gradually more ambitious international greenhouse gas emissions targets<sup>6</sup> demanded a revision of the Directive in 2015 to improve the energy performance of commercial road transport operations by HDVs. Therefore, the amendment of 2015<sup>7</sup> provided for certain derogations from the maximum authorised weights and dimensions of vehicles and vehicle combinations laid down in Council Directive 96/53/EC, to facilitate the use of alternatively fuelled vehicles (including zero-emission heavy-duty vehicles), improve vehicles' aerodynamics and support intermodal transport operations. The reduction of greenhouse gas emissions was the main driver for these derogations, together with increasing road safety levels and the driver's comfort in commercial (freight) transport. The amendment also strengthened the enforcement tools and control measures to ensure undistorted competition and higher level of compliance.

The Weights and Dimensions Directive was subsequently modified in 2019 by a Decision<sup>8</sup> and a Regulation<sup>9</sup>. The first one, brought forward the date of application set up in the Weights and Dimensions Directive to allow more aerodynamic, efficient and safer cabs to be placed on the market from 1st September 2020<sup>10</sup>. Driven by the commitments of the Paris

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<sup>5</sup> Directive 2002/7/EC of the European Parliament and of the Council of 18 February 2002 amending Council Directive 96/53/EC laying down for certain road vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic (OJ L 67, 9.3.2002, p. 47–49).

<sup>6</sup> The Kyoto Protocol, adopted in Kyoto, Japan, in 1997, commits 37 industrialized countries and the European Union to the so-called Kyoto target of reducing their greenhouse gas emissions by an average of 5% against 1990 levels, over the 2008-2012 period. At the 2012 United Nations Climate Change Conference there was an agreement to extend the life of the Kyoto Protocol until 2020.

<sup>7</sup> Directive (EU) 2015/719 of the European Parliament and of the Council of 29 April 2015 amending Council Directive 96/53/EC laying down for certain road vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic (OJ L 115, 6.5.2015, p. 1–10).

<sup>8</sup> Decision (EU) 2019/984 of the European Parliament and of the Council of 5 June 2019 amending Council Directive 96/53/EC as regards the time limit for the implementation of the special rules regarding maximum length for cabs delivering improved aerodynamic performance, energy efficiency and safety performance. OJ L 164, 20.6.2019, p. 30–31.

<sup>9</sup> Regulation (EU) 2019/1242 of the European Parliament and of the Council of 20 June 2019 setting CO<sub>2</sub> emission performance standards for new heavy-duty vehicles and amending Regulations (EC) No 595/2009 and (EU) 2018/956 of the European Parliament and of the Council and Council Directive 96/53/EC. OJ L 198, 25.7.2019, p. 202–240.

<sup>10</sup> The initial date of enter into application of article 9a.3 of Council Directive 96/53/EC was 2 December 2022.

Agreement on Climate Change<sup>11</sup>, the second legal act amending WDD allowed for additional weight derogations for alternatively fuelled HDVs (including zero-emission ones), to promote their deployment in commercial road transport operations.

## **1.2. AMENDMENTS INTRODUCED BY DIRECTIVE (EU) 2015/719 AND THEIR EFFECTS**

The need to reduce greenhouse gas emissions, particularly carbon dioxide (CO<sub>2</sub>) emissions, to improve road safety, to adapt the relevant legislation to technological developments and changing market needs and to facilitate intermodal transport operations, while ensuring undistorted competition and protecting the road infrastructure, were driving forces for the revision of the Weights and Dimensions Directive in 2015.

This section provides an overview of how the measures introduced in 2015 have been implemented and their initial effects on the market in achieving the objectives of the Directive.

### ***1) Derogation on maximum dimensions to equip vehicles with rear aerodynamic devices - Article 8b***

With the aim of improving energy efficiency of vehicles and vehicle combinations as a measure to reduce greenhouse emissions from the road transport sector, Directive 2015/719 introduced, with a new article 8b, the possibility to install aerodynamic devices attached to the rear of heavy-duty vehicles and vehicle combinations used for the transport of goods (lorries) and passengers (buses). To allow their use, while maintaining the current loading length, it was necessary to exceed the maximum lengths permitted under the Directive and, therefore a derogation was introduced to accommodate the dimensions of such devices.

The use of rear aerodynamic devices was subject to certain conditions in order to guarantee road safety, security and efficiency of transport operations:

- technical requirements for the type-approval of vehicles or vehicle combinations equipped with aerodynamic devices needed to be in place;
- the use of aerodynamic devices had to comply with the operational conditions (to be adopted by the Commission);
- the equipped vehicles or vehicle combinations had to be able to comply with the turning circle rule, as set in point 1.5 of Annex I of the Directive<sup>12</sup>; and,
- any exceeding of the maximum lengths should not result in an increase in the loading length of those vehicles or vehicle combinations.

To satisfy the first condition, the Commission adopted Commission Regulation (EU) 2019/1892<sup>13</sup> of 31 October 2019, amending Regulation (EU) No 1230/2012<sup>14</sup>, laying down

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<sup>11</sup> United Nations / Framework Convention on Climate Change (2015) Adoption of the Paris Agreement, 21st Conference of the Parties, Paris: United Nations [Paris Agreement (Dec. 13, 2015), in UNFCCC, COP Report No. 21, Addendum, at 21, U.N. Doc. FCCC/CP/2015/10/Add. 1 (Jan. 29, 2016)].

<sup>12</sup> “Any motor vehicle or combined vehicle which is in motion must be able to turn within a swept circle having an outer radius of 12,50 m and an inner radius of 5,30 m.”

<sup>13</sup> Commission Regulation (EU) 2019/1892 of 31 October 2019 amending Regulation (EU) No 1230/2012 as regards type-approval requirements for certain motor vehicles fitted with elongated cabs and for aerodynamic devices and equipment for motor vehicles and their trailers. OJ L 291, 12.11.2019, p. 17.

the type-approval requirements for the vehicles equipped with aerodynamic devices and for those fitted with elongated cabs. It added certain technical conditions to the aerodynamic devices, such as the requirement to be foldable or retractable when they exceeded 200 mm in length in the in-use position, the prohibition for the vehicles equipped with them to exceed in width by more than 25 mm on each side and the system's resistance to a given pressure in order to be compatible with intermodal transport. The Commission Regulation entered into force on 2 December 2019.

Furthermore, the Commission adopted the operational conditions to ensure the safe use of the aerodynamic devices, including in urban areas, as well as their compatibility with intermodal transport operations, through Implementing Regulation 2019/1916<sup>15</sup>. This Regulation stipulated when the devices have to be in the closed position or even removed and it allowed Member States to prohibit the circulation of vehicles equipped with rear flaps in the in-use position in urban areas. This Regulation entered into force on 8 December 2019.

### Effects:

According to the impact assessment<sup>16</sup> that served as a basis for the proposal amending the Weights and Dimensions Directive, the use of rear aerodynamic devices could lead to a reduction in fuel consumption in the range of 5-8%. At the time of drafting this report (2022), it was not possible to assess the real impacts of the amendment given the short time for implementation since vehicles and vehicle combinations equipped with these devices could be placed into the market (December 2019).

The interviews and questionnaires<sup>17</sup> conducted in the course of the supporting study, helped to assess the interest of the market players to deploy such devices. As confirmed by the study, the key benefits of rear flaps mainly accrue when driving at constant speed. The higher the speed, the higher the energy savings. The rear flaps can be thus mostly beneficial for trailers in long-haul international operations or long national movements.

According to the study, the interest in rear flaps has so far been very modest. Although the manufacturers can deliver flaps for trailers, there has not been much demand from the sector. Despite the estimated benefits, defended by environmental associations and flaps manufacturers, the rear flaps are perceived to be more of a burden, than as a good return on investment. The main argument against investment in these devices, raised by transport operators, is that the rear flaps are only effective when travelling at constant high speed, which makes their use interesting only for long-distance transport and on motorways. This further limits the possibilities to make the necessary fuel savings to offset the investment, which is not negligible given the high price of the rear flaps. Road transport operators also argue that the use of these devices requires additional skills and work of a driver and involves

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<sup>14</sup> Commission Regulation (EU) No 1230/2012 of 12 December 2012 implementing Regulation (EC) No 661/2009 of the European Parliament and of the Council with regard to type-approval requirements for masses and dimensions of motor vehicles and their trailers and amending Directive 2007/46/EC of the European Parliament and of the Council.

<sup>15</sup> Commission Implementing Regulation (EU) 2019/1916 of 15 November 2019 laying down detailed provisions as regards the use of rear aerodynamic devices pursuant to Council Directive 96/53/EC. It has been amended by Implementing Regulation 2020/349.

<sup>16</sup> SWD(2013) 108 final

<sup>17</sup> The supporting study gathered the input from 14 stakeholders representing vehicle and truck manufacturers, road transport operators, including for the transport of indivisible loads and vehicle transporters, road infrastructure managers and public authorities from several Member States.

the risk of unintentionally damaging them. Trials and demonstration projects could help change the perception towards aerodynamic devices<sup>18</sup>.

***2) Derogation on maximum dimensions to support the use of aerodynamic cabs with safer profiles and more comfortable space for drivers - Article 9a***

Improved aerodynamics of the cabs of motor vehicles were expected to bring significant gains in respect of the energy performance of vehicles, especially in conjunction with retractable or foldable aerodynamic devices attached to the rear of vehicles. According to the estimations of the impact assessment<sup>19</sup>, the energy performance was expected to improve between 3.2 % and 8.9 %, depending on the length of the extension of the cab. Additionally, new cab profiles could contribute to improving road safety by reducing blind spots in the driver's vision, including those under the windscreen, and incorporating energy absorption structures in the event of a collision. It was estimated that changing the cabin design could save 300 to 500 lives per year, i.e. a reduction of 10% of the current fatalities in accidents involving trucks.

Furthermore, a potential gain in the size of the cabin should improve the driver's safety and comfort.

The new cab profiles required a derogation from the maximum lengths set by Directive 96/53/EC so that the load capacity of the vehicles would not be reduced to accommodate such cabs with elongated noses.

Similarly to the scheme foreseen for aerodynamic rear devices, article 9a of the Weights and Dimensions Directive set up certain conditions for granting such derogation from the maximum lengths:

- the cabs should improve the aerodynamic performance, energy efficiency and safety performance;
- the technical requirements for the type-approval of vehicles or vehicle combinations equipped with these cabs needed to be in place.

To address this requirement the Commission adopted Commission Regulation (EU) 2019/1892 on the type-approval requirements for the aerodynamic devices and the elongated cabs.

- the derogation from the maximum lengths to allow the use of these cabs should only apply as from 3 years after the date of transposition or application of the necessary amendments to the type-approval legal framework.

Commission Regulation (EU) 2019/1892 entered into force on 2 December 2019 and, therefore, elongated cabs could not be placed into the market before 2 December 2022. To bring forward the start date for the implementation of the special rules for the elongated cabs, the Commission adopted the Commission Decision (EU) 2019/984 which allowed for the placing into the market of the new cabs as from 1 September 2020.

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<sup>18</sup> E.g., the EU-funded AEROFLEX project focuses on innovative and smart solutions to improve efficiency of road transport up to 33% by 2030. It partially relies on the use of aerodynamic devices, including rear flaps, together with the use of active air deflector, active ride height, underbody panel, side cover extensions, dolly side covers, adaptable box and trailer shape, active boat-tail, gap reducer and rear diffuser. <https://aeroflex-project.eu/>

<sup>19</sup> SWD(2013) 108 final

- the vehicles or vehicle combinations equipped with the new cabs had to be able to comply with the turning circle rule, as set out in point 1.5 of Annex I of the Directive<sup>20</sup>.
- any exceeding of the maximum lengths should not result in an increase in the loading length of those vehicles or vehicle combinations.

### Effects:

Given the short period of time elapsed since the type-approval framework entered into force (and even shorter since the new cabs were allowed to be placed into the market), together with the time necessary for the industry to develop a new cab profile design<sup>21</sup>, it was not possible to observe any significant developments on the market in this field. Indeed, the first and the only truck equipped with an elongated cab so far was placed on the market on 9 June 2021<sup>22</sup>. It is reported<sup>23</sup> that the cab has been elongated by 160mm at the front and 330mm at the rear. Coupled with re-designed windows and packaging, it appears to provide improved direct vision substantially. However, the re-shaping of the front is less radical than was envisaged by concepts studied in the development of the Directive.

The findings of the supporting study showed that manufacturers were not developing elongated cabs mainly due to a limited demand for such cabs among transport operators and because they focused their efforts on the compliance with Regulation (EC) No 661/2009<sup>24</sup> (the “General Safety Regulation”) to improve safety performance of commercial vehicles, and on the development of alternatively fuelled powertrains as the preferred way to improve energy efficiency in the transport sector.

### **3) Derogation on maximum weights to support the uptake of alternatively fuelled vehicles – Article 10b**

With the aim to support the introduction of alternatively fuelled vehicles, including zero-emission heavy-duty vehicles, in order to reduce the GHG emissions, article 10b of the Weights and Dimensions Directive foresees the possibility for certain vehicles to exceed the maximum authorised weight by the additional weight required for the alternative fuel technology by up to a maximum of 1 tonne<sup>25</sup>.

The reason behind it is that the use of alternative powertrains, which may include, among others, hybrid powertrains for heavy duty vehicles, trucks or buses, hydrogen fuel cells and

<sup>20</sup> “Any motor vehicle or combined vehicle which is in motion must be able to turn within a swept circle having an outer radius of 12,50 m and an inner radius of 5,30 m.”

<sup>21</sup> According to the industry, it takes between 5 to 10 years to develop a new cab design and place it into the market. Producing a completely redesigned cab in the way envisaged by the W&D Directive is a major undertaking for a manufacturer and it is typically only done rarely, for example, 15-20 years.

<sup>22</sup> Next Generation DAF truck launched on the 9<sup>th</sup> June 2021. <https://youtu.be/4wLUrs4tmQE>

<sup>23</sup> <https://www.daf.com/en/news-and-media/news-articles/global/2021/q2/daf-is-starting-the-future-with-an-entirely-new-line-up-of-trucks-short>;  
[https://startthefuture.daf.com/-/media/files/document-library/brochures/ngd/new-generation-daf-brochure-06-2021-en\\_web.pdf](https://startthefuture.daf.com/-/media/files/document-library/brochures/ngd/new-generation-daf-brochure-06-2021-en_web.pdf)

<sup>24</sup> 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.

<sup>25</sup> Subsequent amendment of WDD (via Regulation (EU) 2019/1242) has introduced 2 extra tonnes for ZEV;

batteries, while reducing pollution, may generate extra weight<sup>26</sup>. That extra weight should not be counted as part of the effective load of the vehicle, since this would penalise the greener road transport operations in economic terms.

The additional weight required should be defined on the basis of the documentation provided by the manufacturer when the vehicle in question is approved. Additionally, it shall be indicated in the official proof of compliance, as regulated in Article 6 of the WDD (i.e. statutory plate or document issued by the competent authorities of the Member State of registration).

The alternative fuels are identified through an exhaustive list included in Article 2 of the Directive. They are defined as those *“fuels or power sources which serve, at least partly, as a substitute for fossil oil sources in the energy supply to transport and which have the potential to contribute to its decarbonisation and enhance the environmental performance of the transport sector, consisting of:*

- (a) electricity consumed in all types of electric vehicles;*
- (b) hydrogen;*
- (c) natural gas, including biomethane, in gaseous form (Compressed Natural Gas — CNG) and liquefied form (Liquefied Natural Gas — LNG);*
- (d) Liquefied Petroleum Gas (LPG);*
- (e) mechanical energy from on-board storage/on-board sources, including waste heat”.*

The alternatively fuelled vehicles and vehicle combinations granted with the derogation on their maximum authorised weight are 2-axle vehicles other than buses, 3-axle motor vehicles, and 4, 5 and 6-axle vehicle combinations (road trains and articulated vehicles).

The Directive foresees that future alternatively fuelled vehicles (with heavier powertrains than those used in conventionally fuelled vehicles) might also benefit from the extra weight allowance. To this end, article 10b of the Directive empowers the Commission to adopt delegated acts to update the list of alternative fuels. The Commission has not made use of this possibility.

Alternatively fuelled vehicles should in any case comply with the maximum authorised axle weight limits set in the Directive. This measure was adopted to protect the road infrastructure from the potential negative impact caused by the extra weight.

### Effects:

The expected effects of the amendment introduced by article 10b of the WDD were to ensure a level playing field for the use of alternatively fuelled vehicles leading to an increase in the uptake of such vehicles.

However, as recognised by the Sustainable and Smart Mobility Strategy<sup>27</sup> “although it is growing rapidly, the proportion of low- and zero-emission vehicles in the vehicle fleet is far

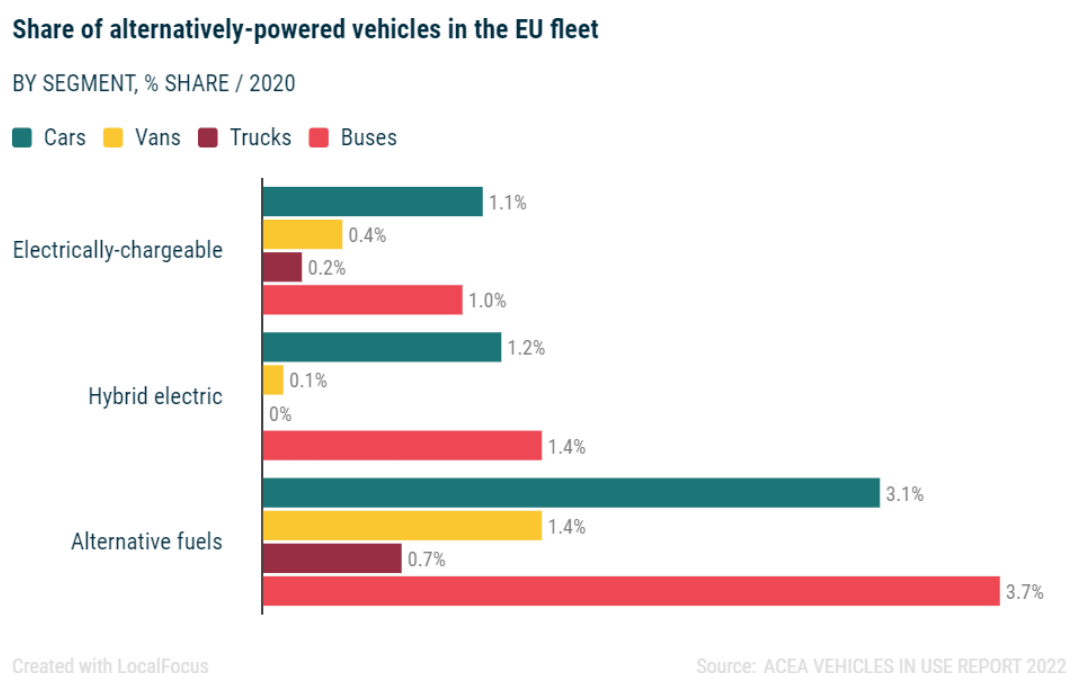
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<sup>26</sup> According to the analysis conducted by Ballard on zero-emission HDVs with a maximum authorised weight of up to 40 tonnes, based on today’s available technologies, it is estimated that the complete fuelling system for a fuel cell HDV would weight approximately 4.270Kg and the fuelling system for a battery electric HDV would weight approximately 6.550Kg, as compared to the 3.000Kg of a conventional diesel HDV.

<sup>27</sup> Sustainable and Smart Mobility Strategy – putting European transport on track for the future, SWD(2020) 331 final.

too low today”. In particular, the EU average proportion of alternatively fuelled vehicles (including as well zero- and low-emission heavy-duty vehicles) within the commercial vehicles’ fleet remains extremely low. In the last five years the number of alternatively fuelled medium and heavy-duty vehicles in use (yearly registration figures) has grown from 0.5% in 2016 to 3.3% in 2020.

*Figure 1. Share of alternatively-powered vehicles in the EU fleet in 2020. Source: ACEA*



Passenger transport seems to make more use of the alternative fuels than freight transport vehicles. Buses and coaches also rely mainly on natural gas (LNG and CNG), which can be a short-term solution, but does not significantly contribute to CO<sub>2</sub> emissions reduction. The figures show, however, an incipient presence of electric buses, both hybrid electric (1.4%) and electrically-chargeable (1%) mostly in urban transport.

As for freight transport, some truck manufacturers consider the additional weight allowance provided by the Weights and Dimensions Directive will be exploited, but it has not had any impact on the design of the alternatively fuelled vehicles yet. With this in mind, they expect a broader deployment of electric trucks in 2025 for city-distribution transports, and for long distance transports a few years later.

According to the findings of the supporting study, there was no particular change in the demand for alternatively fuelled and/or zero emission powertrains that could be directly attributed to the amended Directive. Both transport operators and vehicle manufacturers consider that the demand depends mainly on the technological maturity of those types of powertrains and access to relevant charging/refuelling infrastructure.

#### ***4) Increased maximum authorised weight for two-axle buses – Point 2.3.1 of Annex I***

In order to compensate the substantial increase in the average weight of bus passengers and their luggage since the approval of Directive 96/53/EC and the weight of the vehicle's equipment needed to meet the new technical requirements and put an end to the gradual reduction of passengers carried by bus, the WDD amendment introduced (point 2.3.1 of Annex I) the increase in the maximum authorised weight for two-axle buses from 18 tonnes to 19.5 tonnes.

#### ***Effects:***

Urban buses are gradually shifting to better performing and more efficient propulsion systems in cities all over the EU. While, according to the supporting study the decisions to renew the bus fleets cannot be directly related to the increased maximum authorised weight, they surely benefit from it as the additional cost of introducing electric buses can be to some extent compensated by the potential to carry more passengers and/or heavier luggage, in particular in long distance transport.

#### ***5) Derogation on maximum weights and dimensions to support the carriage of 45-foot containers and 45-foot swap bodies as part of intermodal transport operations – Article 10c and point 2.2.2(c) and (d) of Annex I***

Intermodal transport is a type of multimodal transport where the goods are not handled between different modes of transport. Instead, the full (unopened) loading unit (e.g. a container) is transhipped from one vehicle (e.g. truck) to another (e.g. rail wagon or vessel). Intermodal freight transport is possible in many combinations and typically involves one or two road legs connecting the starting or ending point to the non-road leg.

With the aim to facilitate intermodal transport operations Directive (EU) 2015/719 introduced the following amendments:

##### ***a) Article 10c of the Weights and Dimensions Directive:***

The vast majority of intermodal operations use containers. Containers account for 71.5% of the tonne-kilometres of intermodal transport in the EU and, among them, 45-foot containers and swap bodies have been increasingly used. However, the road components of intermodal transport operations carrying 45-foot containers and swap bodies could only be undertaken if both the Member States and the transporters follow cumbersome administrative procedures, or if those containers have patented chamfered corners, the cost of which is prohibitive.

To overcome this challenge, Directive (EU) 2015/719 introduced a new article 10c allowing for an increase of 15 cm in the maximum authorised length and the maximum distance between the axis of the fifth-wheel king pin<sup>28</sup> and the rear of a semitrailer of the vehicles or vehicle combinations engaged in the transport of 45-foot containers or swap bodies, provided that they were part of an intermodal transport operation as defined in the Directive. This

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<sup>28</sup> Also known as “fifth wheel”, the fifth-wheel king pin is a coupling system providing the link between a semi-trailer and the towing truck, tractor unit, leading trailer or dolly. The device allows the front axle assembly to pivot in the horizontal plane, to facilitate turning.

would eliminate the need for chamfered corners as a standard semitrailer could accommodate a standard 45' container or swap body (13,6m).

*b) Points 2.2.2(c) and 2.2.2(d) of Annex I of the Weights and Dimensions Directive:*

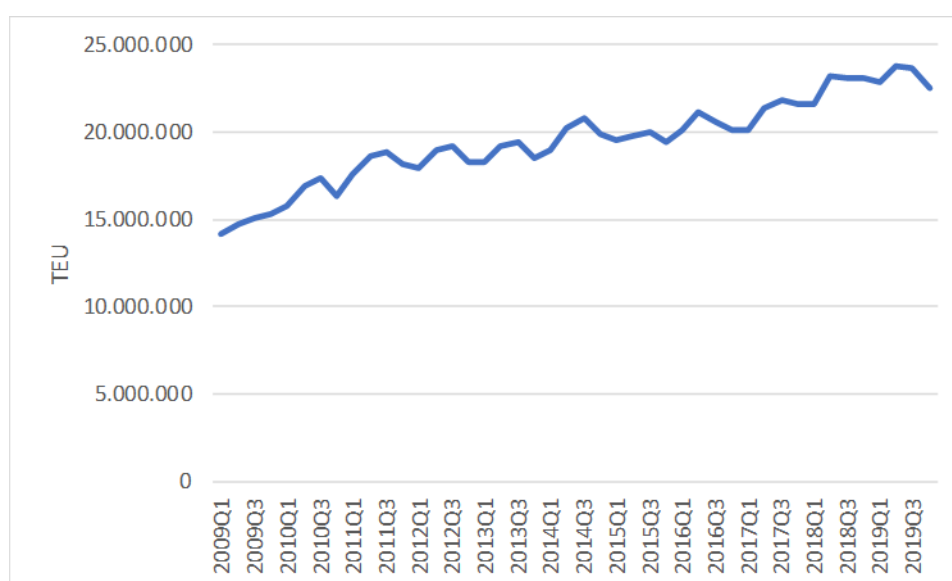
To further promote intermodal transport operations and to take account of the unladen weight of containers or swap bodies of a length of up to 45 feet, without modifying the maximum axle weight limits, the following additional derogations were introduced:

- Two-axle motor vehicles with three-axle semi-trailers carrying, in intermodal transport operations, one or more containers or swap bodies, up to a total maximum length of 45 feet could reach a maximum authorised weight of 42 tonnes" as opposed to the original 40 tonnes.
- Three-axle motor vehicle with two- or three-axle semi-trailer carrying, in intermodal transport operations, one or more containers or swap bodies, up to a total maximum length of 45 feet could reach a maximum authorised weight of 44 tonnes.

Effects:

Intermodal transport operations are considered an important element in the transition towards climate reductions in freight transport in the EU. Intermodal transport has been growing for the last ten years, both before and after the implementation of Directive (EC) 2015/719.

*Figure 2. Development in loaded and unloaded containers per quarter in the EU.*



*Source: Eurostat*

The use of 45-foot containers and swap bodies, which account for 19% of the ISO-container category, has been increasing during this period as they are considered the most efficient cargo units for intermodal transport. This development suggests, at the very least, that the amendments introduced by Directive 2015/719 have contributed to facilitating the growth of intermodal transport operations.

Enabling the use of standard 45-foot containers and swap bodies was highly welcomed by the market operators and the expectation is that the large containers (45-foot and high-cube containers) will increase gradually their market share of containerised transport in the future.

#### **6) Enforcement of rules on maximum weights – Articles 10d, 10g, 10e and 10f**

In order to avoid distortions of competition and to ensure road safety it was necessary that Member States addressed adequately the infringements in relation to overloaded vehicles. This was tackled in Directive (EU) 2015/719 by improving the means for controlling and detecting overload infringements and introducing the principles of co-liability of shippers and hauliers.

Member States were required (article 10d) to take specific measures, by 27 May 2021, to automatically identify vehicles or vehicle combinations in circulation that are likely to have exceeded the relevant weight limits and that should therefore be checked. Such pre-identification may be carried out by means of weighting mechanisms built into the road infrastructure, the so-called "Weight In Motion (WIM)" system, or by means of on-board weighting equipment (OBW) to be installed in vehicles that communicate data remotely to the relevant authorities. If the second option was chosen such on-board data should be made available also to the driver, allowing them to monitor their own compliance at all times. Commission Implementing Regulation (EU) 2019/1213<sup>29</sup> established the uniform conditions for the implementation of interoperability and compatibility of said OBW equipment.

The automatic detection systems are primarily addressed to identify vehicles or vehicle combinations that are "likely" to have exceeded the maximum weight limits established in the Directive. However, they can additionally be used to establish infringements and to impose penalties, in which case they have to be certified.

Every year, Member States should perform an appropriate number of vehicle weight checks (Article 10d, paragraph 2). The number of such checks should be proportionate to the total number of vehicles inspected each year in the Member State concerned.

Article 10g of the W&D Directive requires Member States to report to the Commission every two years the number of checks carried out in the previous two years and the number of overloaded vehicles or vehicle combinations detected.

A number of Member States have not complied with this obligation<sup>30</sup>. According to the available data from nineteen Member States on the results of controls carried out in 2019-2020, seventeen million vehicles and vehicle combinations have been checked, 3.3% of which were reported overloaded. Ireland performed the highest number of controls (around 12.6 million controls), followed by far by Poland (around 3 million controls) and Italy (almost 600,000 controls). The high level of controls performed in Ireland can be attributed to the exclusive use of automatic weighting systems.

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<sup>29</sup> Commission Implementing Regulation (EU) 2019/1213 of 12 July 2019 laying down detailed provisions ensuring uniform conditions for the implementation of interoperability and compatibility of on-board weighing equipment pursuant to Council Directive 96/53/EC. OJ L 192, 18.7.2019, p. 1–22.

<sup>30</sup> Only seventeen Member States have provided information for the reporting periods 2017-2018 and nineteen MS for 2019-2020.

Member States are obliged to lay down rules on penalties for infringements of the WDD and to ensure their implementation. Those penalties should be effective, non-discriminatory, proportionate and dissuasive.

Finally, to facilitate the control of overweight containerised transport, article 10f requires that Member States oblige shippers and hauliers to provide control authorities with the information related to the weight of containers and swap bodies.

#### Effects:

Some Member States have been using detectors in the road for quite a long time (prior to 27 May 2021) and all of them have opted for the deployment of WIM systems in the infrastructure.

The alternative solution of installing on-board weighting equipment (OBW) has generally been assessed as putting too much (economic) burden on the users, although there are operators installing them for commercial reasons in order to better manage their fleets, to ensure compliance with the weight limits at all times, to invoice customers (typically for bulk cargo).

The information that Member States have to notify in compliance with Article 10g of the WDD on the number of checks and overloaded HDVs detected will be useful in the future to show the level of compliance with the rules on maximum authorised weights and, more importantly, any changes in the efficiency of the controls undertaken in those cases where automatic detection systems were not in use before May 2021. However, the lack of information on the number and type of WIM systems deployed in the Member States will limit the scope of the assessment.

## **SPECIFIC MARKET SEGMENTS**

This chapter presents characteristics of five pre-identified market segments of the road transport sector for which weights and dimensions of vehicles are particularly relevant and assesses the effects that the current rules have on them. These market segments are: high capacity vehicles, transport of indivisible loads, vehicles with special equipment, transport of vehicles and military transport.

### **1.3. GENERAL RULES AND DEROGATIONS ON WEIGHTS AND DIMENSIONS**

Chapter 2.1 of this report provides an outline of the scope of application of the Weights and Dimension Directive. To analyse how the implementation of the Directive affects the specific transport segments it is necessary to understand certain details of the regulatory framework.

Directive 96/53/EC established the maximum authorised dimensions of HDVs in national and international traffic and the maximum authorised weights in international traffic. The primary objective was to ensure fair competition and eliminate the obstacles to cross-border traffic, while safeguarding the right balance with the need to protect road infrastructure and guarantee road safety.

The key limits regarding **maximum dimensions** are the following:

- maximum length: 16.5m for articulated vehicles (motor vehicle/semi-trailer combinations) and 18.75m for road trains (motor vehicle/trailer combinations);
- maximum height: 4 m;
- maximum width: 2.55 – 2.60m; and to be able to turn within a swept circle having an outer radius of 12,50m and an inner radius of 5,30 m.

The key limits regarding **maximum weights** are the following:

- maximum weight: 18 tonnes for two-axle trucks and 19,5 tonnes for two-axle buses;
- maximum weight: 26 tonnes for three-axle motor vehicles and 28 tonnes for three-axle articulated buses;
- maximum weight: 32 tonnes for four-axle vehicles and 36 tonnes for four-axle vehicle combinations;
- maximum weight: 40 tonnes for five or six-axle vehicle combinations, which could be increased to 42/44 tonnes (depending on the number of the axles of the vehicle combination) for certain vehicles engaged in intermodal transport operations;
- maximum authorised axle weight ranging from 10 tonnes for a single non-driving axle, to 24 tonnes of certain tri-axes of trailers and semitrailers.

Vehicles complying with those limits are allowed to circulate on the territory of the EU without any restrictions.

The WDD allows for **national derogations**, so that Member States may authorise the circulation in their territories of HDVs exceeding the maximum weights (with no limitations) and /or maximum dimensions set in the Directive. The national derogations for dimensions of vehicles are limited to specific use cases, namely:

- (i) specialised vehicles, such as the ones used in the forestry industry;
- (ii) European Modular System (EMS); and
- (iii) trial schemes.

The W&D Directive does not explicitly allow heavier or longer vehicles in international transport. HDVs used in international transport are bound by the limits set in the Directive even when they cross the territory of two neighbouring Member States that allow the same higher maximum authorised weights and/or dimensions on their territories. Here, the directive foresees certain exceptions.

### ***Derogations to maximum dimensions in national transport***

Articles 4(4) and (5) of the Directive allows for extra dimensions of HDVs in the following cases:

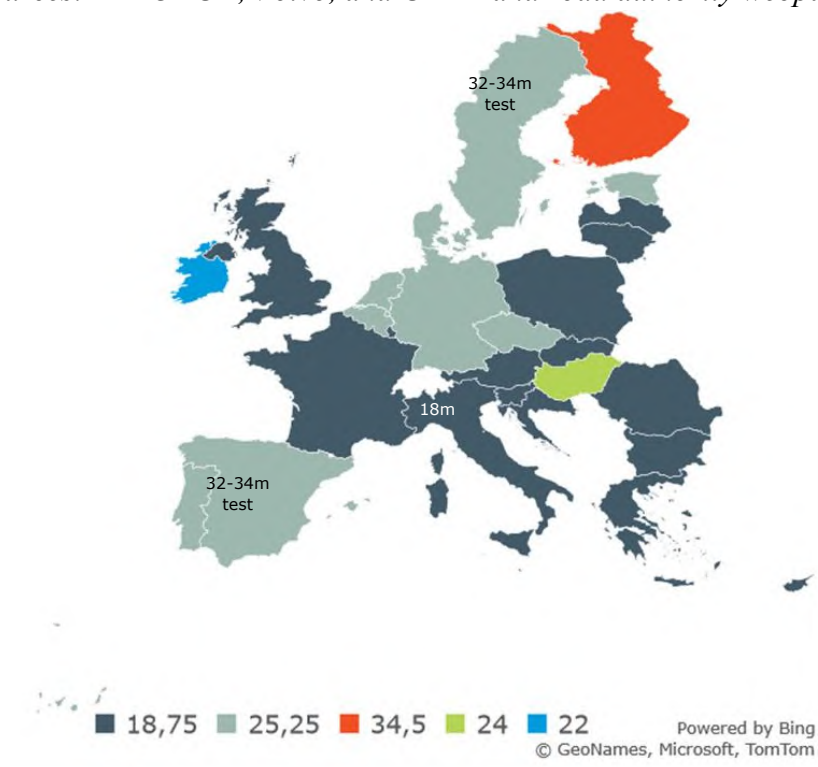
- 1) **local activities**: Member States may allow in their territory longer (and/or wider) specialised vehicles or vehicle combinations in circumstances in which they are not normally carried out by vehicles from other MS, e.g. operations linked to logging and forestry industry.
- 2) **modular concept**: Member States may allow longer and/or wider vehicles or vehicle combinations in national transport under the condition that they also allow the circulation of standard vehicles (motor vehicles, trailer and semitrailer) in such combinations as to reach the same loading length authorised in the given Member

State. These combinations are known as modular concept or European modular systems (EMS).

- 3) **trial periods:** Member States may conduct local transport operations for trial periods incorporating new technologies or new concepts, with vehicles or vehicle combinations exceeding maximum weights and/or dimensions. Member States have made use of this possibility to allow EMS. The most common combinations of EMS under trial schemes are 25.25 m and 60 tonnes, although other variants exist.

Currently, the use of modular systems (EMS) of 25.25m long is allowed in Finland and Sweden, and is being trialled in Denmark, the Netherlands, Belgium, Spain, Portugal, Czech Republic and some German Länder. Additionally, Italy allows for longer semitrailers so as to allow for a maximum length of the vehicle combination of 18m.

*Figure 3. Maximum national permissible lengths of HDVs in the EU.  
Sources: ITF-OECD, Volvo, and CEDR and road authority webpages*



### ***Derogations to maximum dimensions in international transport***

The extensive use of EMS in national transport triggered the question of the lawfulness of the cross-border transport between neighbouring Member States that allow the use of longer vehicles in their territories. In this respect the explanation provided by former Vice-President Siim Kallas in his letter of 13 June 2012 to MEP Brian Simpson, Chairman of the TRAN Committee of the European Parliament at the time stated that the cross-border use of longer vehicles was lawful for journeys crossing one single border between two Member States that allow such longer vehicles on their territories if the derogation conditions were met, as it would not significantly affect international competition. Some Member States have applied this rule on the basis of bilateral agreements. Currently, this is the case of the cross-border

transport of EMS between Finland and Sweden, Sweden and Denmark, Belgium and the Netherlands and between Germany and the Netherlands<sup>31</sup>.

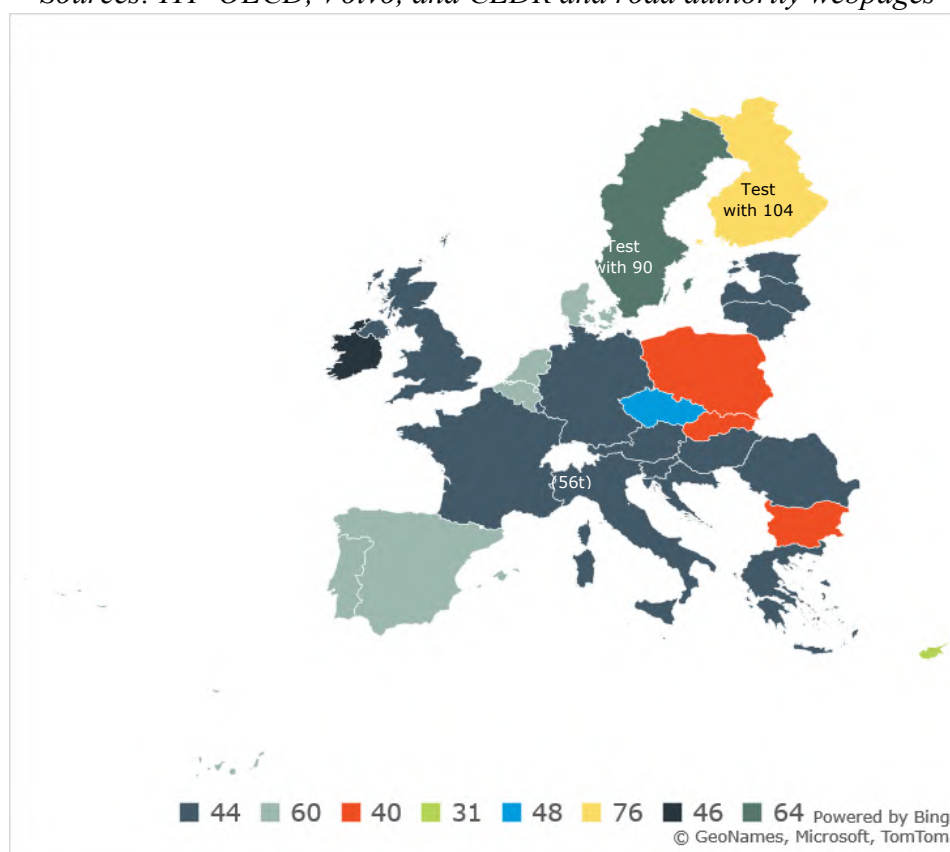
### ***Derogations to maximum weights in national transport***

Member States are free to allow on their territories the circulation of heavier vehicles without any limitations.

As a result, there is a range of national weight limitations in the EU for vehicle combinations of five or more axles varying from 40t to 44t, 48t, 50t, 60t and up to 104t for nine and ten-axle vehicle combinations in different Member States.

All Member States allowing EMS (Finland and Sweden, and trials in Denmark, the Netherlands, Belgium, Spain, Portugal and Czech Republic) with the exception of Germany, allow for an extra weight (of up to 60 tonnes in most cases). Additionally, Belgium, Czech Republic, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Sweden, Denmark and Finland allow the circulation in national transport of five and/or six-axle vehicle combinations with a maximum weight of 44 tonnes<sup>32</sup>.

*Figure 4. Maximum national permissible weights of HDVs in the EU.  
Sources: ITF-OECD, Volvo, and CEDR and road authority webpages*



<sup>31</sup> There is also cross-border transport of HDV exceeding the maximum height of 4m between Ireland and the UK.

<sup>32</sup> Czech Republic allows a maximum weight of up to 48t, the Netherlands of up to 50t and allows a maximum weight of up to 56t for the transport of excavation and mining materials.

## ***Derogations to maximum weights in international transport***

Apart from derogations from the maximum authorised weight for intermodal transport operations, alternatively fuelled vehicles, and the transport of indivisible loads, the directive does not foresee any derogations from weight limits applicable to international transport. This means that the Directive does not allow to cross borders by heavier vehicles (other than those eligible for derogation) between neighbouring countries even if both of them authorise 44 tonnes HDVs (or use heavier EMS) in their respective territories.

There is, however, a particular situation applicable to the Benelux countries. It originates in the Treaty Establishing the Benelux Economic Union<sup>33</sup>, which was recognised by article 350 of the Treaty of the Functioning of the EU<sup>34</sup>. As a result, Belgium, Luxembourg and the Netherlands, are allowed to take advantage of the possibility foreseen in article 4(5) of the WDD<sup>35</sup>, without the borders of the three countries being an impediment to conducting trials, in order to realise the Benelux internal market. The Benelux countries have made use of this possibility for cross-border transport by heavier vehicles up to 44t.

In addition to this diversity of regimes, the directive foresees the international transport of indivisible loads<sup>36</sup> which, owing to their dimensions or masses, cannot be transported in a vehicle or vehicle combination complying with the limits set in the Directive. The circulation of this particular type of transport is subject to a national special permit, which should be issued without discrimination (article 4(3) of the Directive). Other than that, Member States are free to authorise the transport of indivisible loads and to set the procedure and conditions for the issuing of the permits.

### **1.4. MARKET SEGMENTS**

The complex regulatory framework, described in the previous section, has a particular effect on certain market segments for which the maximum weights and dimensions are especially relevant. Namely, high capacity vehicles, transport of indivisible loads, vehicles with special equipment, transport of vehicles and military transport.

#### ***1.4.1. High capacity vehicles***

The denomination of high-capacity vehicles (HCV) is commonly applied to any vehicles or vehicle combinations used in freight transport that exceed the maximum weights and/or dimensions set up in Annex I of Directive 96/53/EC in order to increase their loading capacity. In practice, the most commonly exceeded parameters are the maximum weight and

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<sup>33</sup> Consolidated version of the Treaty Establishing the Benelux Economic Union available in <https://wetten.overheid.nl/BWBV0005047/2012-01-01>

<sup>34</sup> Article 350 of the TFEU: “*The provisions of the Treaties shall not preclude the existence or completion of regional unions between Belgium and Luxembourg, or between Belgium, Luxembourg and the Netherlands, to the extent that the objectives of these regional unions are not attained by application of the Treaties.*”

<sup>35</sup> Article 4.5 of the Weights and Dimensions Directive: “*Member States may allow vehicles or vehicles combinations incorporating new technologies or new concepts which cannot comply with one or more requirements of this Directive to carry out local transport operations for a trial period.*”

<sup>36</sup> Indivisible load is defined by Article 2 of Council Directive 96/53/EC as “*a load that cannot, for the purpose of carriage by road, be divided into two or more loads without undue expense or risk of damage and which owing to its dimensions or mass cannot be carried by a motor vehicle, trailer, road train or articulated vehicle complying with this Directive in all respects.*”

the maximum length of vehicles and vehicle combinations (regulated in points 1.1 and 2 of Annex I of the W&D directive).

HCV can be formed of one or more units (motor vehicle, trailer and semitrailer) that individually exceed the limits set up in the Directive.

However, the type of HCV that is most commonly used in the EU are the European Modular Systems (EMS), i.e. the vehicle combinations where each of the individual units or vehicles (tractor, trailer and semi-trailer) are standard units (i.e. type-approved) that fully comply with the limits set out in Council Directive 96/53/EC. It is only the combination of those vehicles and units that exceeds the limits. The most common type of EMS currently in use in the EU are those reaching up to 25.25m long and 60t, also known as EMS1. These are some examples:

*Figure 6. Typical EMS combinations used in European transport.*



**Type 1** consists of a traditional lorry (N3) in combination with a dolly and a semitrailer. The total<sup>37</sup> length is up to 25.25m, and the total weight up to 60 tons with 8 axles.

**Type 2** consists of a tractor, a semitrailer and a trailer. Again, with up to 8 axles, up to 25.25m length and 60 tons of total weight.

**Type 3** consists of a tractor, a shorter link trailer and a traditional semitrailer. Again, up to 25.25m and 60 tons.

**Type 4** consists of a long truck and a long trailer (both units up to 12m) with a total length of 24m. Equipped with only 6 axles, the total weight is up to 48/50 tons.

<sup>37</sup> There are some variations in eligible dimensions and weight in different countries, which will be further outlined below

HCV of up to 22 or 24 meters long were in use in the Scandinavian countries long before the adoption of Directive 96/53/EC. In order to allow their use and to prevent the distortions of competition it was accepted that Member States could operate larger vehicles and vehicle combinations with deviating dimensions on their territory when transport operators established in a different Member State could compose competitive vehicle combinations with their standard European equipment. This required that the Nordic countries increased their allowed maximum length on their territories to 25.25 meters, as 22 or 24 meters was not enough for such *ad hoc* vehicle combinations. Thus, EMS were born as a condition for the Scandinavian countries to continue with their deviating vehicles (22 or 24 meters) and is used until now in Scandinavia.

Other Member States also wanted to make use of this possibility. Some Member States started national trials with high capacity vehicles, mostly following the modular concept<sup>38</sup> which they found interesting for certain dedicated routes.

The trials have demonstrated some positive impacts in terms of improved energy and operational efficiency, and no negative effects in terms of road safety or infrastructure investments therefore the Member States have either renewed their trials or taken them further allowing increased capacity (in length and weight) and/or allowing the cross-border transport of EMS based on bilateral agreements.

EMS are currently allowed under trial schemes in Denmark, the Netherlands, Belgium, Spain, Portugal, Czech Republic and Germany. These Member States authorise the use of EMS of 25.25m long and 60t (EMS1), with the exception of Germany where the maximum authorised weight remains at the general level of 40t (44t for intermodal transport). In some cases (Finland, Sweden and Spain) longer EMS of up to 32m and 70t (EMS2) are authorised or under trials.

### Specific requirements

In addition to the national rules on maximum weights and dimensions applicable to EMS, Member States have imposed further requirements to authorise their use. The different regimes range from a very permissive scheme in the northern countries, where there is no need for special permits<sup>39</sup> and EMS are allowed in the largest part of the road network, to a much more restrictive and conditioned use of EMS, where they are subject to special permits, specific driver's training or experience and mandatory vehicle equipment, such as minimum engine power, advanced braking systems, a minimum energy performance<sup>40</sup> or sideguard warnings to increase road safety.

In all cases, the use of EMS is restricted to certain parts of the road network, which are selected on grounds of road safety, as well as in view of the physical capacity of the infrastructure to withstand the passage of these vehicle combinations. In most cases, the road network has been assessed in order to identify the suitable routes where EMS could be allowed in terms of weight (assessment of sensible infrastructure, such as bridges) and manoeuvrability (infrastructure layout). However, depending on their policy Member States

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<sup>38</sup> The only exception is Italy where, after the so-called "*Progetto 18*", it has been authorised the circulation of articulated vehicles with a total length of up to 18m (maximum length according to the W&D directive is 16,50m) using longer semitrailer, instead of EMS formed of standard modules.

<sup>39</sup> See part related to "long-term permits" for indivisible loads and abnormal transport in section 3.2.2.

<sup>40</sup> According to the supporting study Belgium requires a minimum of EURO VI standard.

have also adjusted and reinforced the infrastructure when they considered to authorise EMS in a wider part of the network. In general terms, motorways and high capacity roads with dual carriageways are the natural infrastructure where EMS can safely circulate. They are designed to accommodate high traffic volumes at high speeds, they are the safest roads and they virtually eliminate the risk of head-on collisions and collisions at intersections, as well as the interaction with vulnerable road users. The percentage of the network where EMS can circulate vary among Member States, reaching up to 90% of the state road network in Sweden. It is also generally permitted to access interurban conventional “connecting” roads (with single carriageways) in order to reach production facilities, depots, logistic centres, ports and intermodal terminals. The circulation of EMS in urban areas is generally forbidden, avoiding the interaction with vulnerable road users.

In Member States, such as Germany, the Netherlands, Spain or the Czech Republic, where the use of EMS is subject to the issuing of special permits upon compliance with the national requirements, the procedures follow the same scheme as those for the authorisation of indivisible loads or abnormal transport. Access to the infrastructure is granted depending on the physical characteristics (weights and dimensions) of the vehicles or vehicle combinations.

This multiplicity of requirements adds complexity to this segment and poses a barrier to the provision of transport services at the EU level. There is, however, certain level of mutual recognition<sup>41</sup> and attempts of harmonisation between those Member States allowing the cross-border transport of EMS, although differences still exist<sup>42</sup>.

### Use of HCV

The distinctive characteristic of HCVs from a commercial perspective is that they are able to transport more cargo in one trip than a standard heavy-duty vehicle. Additionally, EMS are particularly appreciated by the industry due to their flexibility: different units can be coupled to and decoupled from the towing vehicle, adapting the transport service to the characteristics of the transport operation. On the other hand, the challenge for carriers is to optimise the use of the loading capacity, as it will be limited either by the weight or by the volume of the cargo and which is directly influenced by the different rules applicable across the EU.

In this respect, while Sweden and Finland are highly dependent on bulk industries (e.g. forestry, metal industry and mining)<sup>43</sup>, HCV are mostly used in Europe for the transportation of voluminous goods<sup>44</sup>, such as automotive parts<sup>45</sup>, textiles, flowers, engines and paper products. Market developments also show a trend towards lower density goods.

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<sup>41</sup> Mutual recognition of special training of EMS’ drivers between Belgium and The Netherlands.

<sup>42</sup> As an example, the approach to the cross-border traffic of EMS between Germany and the Netherlands is based on the compliance with each MS’ requirements, such as the limitation of the maximum weight to 40 tons and the equipment of vehicles with additional safety features while circulating in Germany.

<sup>43</sup> Henrik Pålsson & Henrik Sternberg (2018) LRN 2016 SPECIAL – high capacity vehicles and modal shift from rail to road: combining macro and micro analyses, International Journal of Logistics Research and Applications, 21:2, 115-132, DOI: 10.1080/13675567.2018.1430232. Link to this article: <https://doi.org/10.1080/13675567.2018.1430232>

<sup>44</sup> Sesé Group in Spain quantifies the amount of voluminous goods, as opposed to heavy goods, in 70% of the cargo transported by EMS.

<sup>45</sup> According to IRU, in Germany, where EMS of up to 25,25m long are authorised, although with no additional weight (the limit remains at the general one of 40t/44t) carriers have found a very interesting niche for EMS in the transport of automotive parts. In this sector they claim to obtain very good results in terms of energy saving (up to 20-25%).

EMS are more often used in long distance transport (above 200Km). However, some successful experiences for short distance also exist, particularly between distribution/consolidation centres and manufacturing plants, warehouses serving large shopping areas or supermarkets, as well as transshipment locations and ports, where the transport between the two points is highly frequent<sup>46</sup>.

As regards quantitative data, the official information on the circulation of EMS is limited due to the fact that EMS are formed of standard units and that they are individually registered and inspected. There are, however, some official figures provided by Member States where EMS are subject to authorisation or under trial schemes (Spain, Belgium and the Netherlands).

With the exception of Sweden and Finland, where HCVs are widely used<sup>47</sup> (up to 90% of the total amount of tonne-km), the penetration of EMS in the other Member States is relatively low. Among them the Netherlands is the one with the highest rate reaching up to 9.5% of the HDV fleet. The high penetration of HCV in the Scandinavian countries can be explained by the following factors: the geographical conditions, with sparsely populated areas and long distances; insufficient railway or waterway infrastructure; the limitations imposed to water-based transport by the winter weather conditions; the high proportion of the network open to HCV; the long-term culture in the use of HCV as well as the favourable legal framework. According to the industry, the possibility to conduct cross-border operations also influences the market, as it seems to be the case in both, the northern countries and the Netherlands. However, the uptake of EMS in Belgium, which enjoys the same opportunities for cross-border transport as the Netherlands, is very low. Other elements, such as the access to ports and international hubs and the conditions applied in the neighbouring countries, may also influence the market for EMS. However, aspects related to the modal cooperation of HCV are not within the scope of this report.

### Challenges of the use of HCV

Despite that HCVs have a potential of bringing reductions in terms of road congestion, energy consumption, greenhouse gas (GHG) emissions, operational costs as well as optimised use of the available pool of professional drivers<sup>48</sup>, their effective use faces a number of challenges. They are linked mainly with the concerns about load factor, potential impacts on infrastructure, road safety and modal shift.

According to the information provided by the European Environmental Agency, Eurostat and some national reports in 2019 the average **load factor**<sup>49</sup> in road transport, in general, remained under 50 % of the loading capacity (by weight), showing an important underuse of the cargo capacity. On the other hand, given the adaptability of the EMS, composed of

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<sup>46</sup> Longer and Heavier Vehicles in practice. Economic, logistical and social effects. June 2011. Ministry of Infrastructure and the Environment, the Netherlands.

<sup>47</sup> According to the study “A review on megatrucks. Major issues and case studies”, commissioned to Steer Davies Gleave by the European Parliament in 2013, in Finland and Sweden the market is dominated by LHVs (long and heavy vehicles), which carry around 90% of goods in terms of tonne-km.

<sup>48</sup> According to the HCT DUO2-project study the study (Cider L, Larsson L, HCT DUO2-project Gothenburg-Malmö in Sweden, 2019), the number of standard trucks can be replaced by HCVs at a ratio of 3:2 (for 25.25m EMS) or 2:1 (for 32m EMS), which thus gives the ratio of vehicle kilometres needed to move the same amount of goods.

<sup>49</sup> The European Environmental Agency defines “load factor” as the ratio of the average load to total vehicle freight capacity (vans, lorries, train wagons, ships), expressed in terms of vehicle kilometres. Empty running is excluded from the calculation. Empty running is calculated as the percentage of total vehicle-kilometres which are run empty.

individual standard units that can be uncoupled forming longer or shorter combinations in order to match the characteristics of the transport operation, it can be expected that transport carriers would only use EMS when they are the most cost-efficient solution compared with ordinary trucks. In principle, it would result in a higher load factor compared with standard HDVs.

The use of HCV indeed requires an appropriate road infrastructure that can cope with technical features of such vehicles in order to reduce a risk of the wear and tear of the **road infrastructure (pavements)**, as well as a risk of damage to certain structures (e.g., such as bridges, tunnels and roundabouts). The impact on road maintenance and adaptation of the infrastructure has been assessed in different studies, which found that, generally, the negative effects on the infrastructure would be limited<sup>50</sup>. Most studies show that the additional number of axles offset the additional weight, in particular in situations where modular units are confined to a dedicated road network where the necessary adaptations have been made. Such adaptations in particular relate to road curvature, road turns, bridges, parking areas and roundabouts. The carrying capacity of bridges and enlargement of parking areas remain the key elements for the adaptation investments.

In terms of extra weight, increasing the axle weight of HDVs would increase the wear of the pavement, while the total weight of the vehicle combination is a more relevant parameter for the safety of old bridges. Member States allowing the use of HCV have not increased the axle weight for this type of vehicles. In practice, it decreases due to the addition of axles.

As regards extra dimensions Member States have maintained the turning circle rule ensuring the manoeuvrability of EMS. It enables EMS to circulate in most existing roundabouts on the dedicated networks for large vehicles (motorways and high capacity roads). As an example, EMS are allowed to circulate in 90% of the state road network in Sweden and in 60% of the federal road network in Germany (almost 11.600 km of the so-called “Positivnetz<sup>51</sup>”). According to the article published by the German Federal Ministry for Digital affairs and Transport on September 2021<sup>52</sup> one of the main findings of the report from the Federal Highway Research Institute is that the circulation of EMS in Germany has not increased maintenance costs for the infrastructure<sup>53</sup>.

According to the supporting study, based on the assessment conducted by some Member States, most necessary adaptations to the infrastructure will be related to the connections between high capacity roads and destinations at loading/unloading facilities. To make sure that the road structures are capable to carry HCV, and therefore EMS, and to estimate the

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<sup>50</sup> According to the study “Definition and Validation of a Smart Infrastructure Access Policy utilising Performance-Based Standards”, carried out in the context of the FALCON project “*if normalizing the damage with the characteristics of the vehicle (length, volume, total mass or payload), high capacity vehicles do not exhibit more damage than standard vehicles*”.

<sup>51</sup> <https://www.bmvi.de/SharedDocs/DE/Artikel/StV/lang-lkw-positivnetz.html>

<sup>52</sup> <https://www.bmvi.de/SharedDocs/DE/Artikel/StV/Strassenverkehr/lang-lkw-aenderungsverordnung.html>

<sup>53</sup> Longer (25.25m long) but not heavier EMS are allowed in Germany in the Positivnetz (positive road network). They should remain under the general limit of 40 tonnes (44 tonnes for intermodal transport).

necessary investments Member States have assessed their road network<sup>54</sup>. Depending on the national policy (foreseen investments, actual possibilities for the road infrastructure to be adapted) Member States have decided to reinforce and adapt their infrastructure and/or restrict the itineraries that can be used by HCV, confining them to certain parts of the network where they can safely circulate.

As regards impacts of the use of HCV on **road safety**, literature review from different studies and projects analysing data from the EU (Sweden, Germany, Denmark, the Netherlands), Canada, USA and Australia, as well as the experience from Member States show that EMS do not increase the risk of accident, but they slightly reduce it compared to conventional trucks. The supporting study estimates that EMS have already contributed to road safety with over 22 million euros of costs savings per year<sup>55</sup>.

Member States allowing HCV that have not conducted road safety studies claim that the circulation of EMS have not raised any safety issues (no serious accidents detected or no accidents at all). All Member States have introduced additional safety measures to allow the circulation of HCV, such as limiting the use of HCV to certain (safest) parts of the road network and the prohibition of their use in urban areas avoiding the interaction with vulnerable road users. Some Member States also require minimum standards for the vehicles (advance braking system, minimum engine power), additional safety features (side warning system), traffic rules (prohibition of overtaking) and/or a minimum experience or training of drivers.

On the occasion of the 2015 revision of the WDD, which was looking also into allowing longer vehicles in cross-border operations, the concerns were raised by the industry and some national authorities that allowing additional payload, thus making road freight transport more efficient may lead to a **modal shift** from (currently) more sustainable modes of transport (rail and Inland Waterways (IWW)) to road. This aspect has not been analysed as part of the supporting study and it is not within the scope of the present report. An eventual revision of the WDD should assess the economic and environmental impacts of HCVs on the whole transport system by all modes.

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<sup>54</sup> Denmark estimated costs of adapting the infrastructure for approximately 20 million euros (some roundabouts and intersections leading to and from ports and other terminals) for the introduction of EMS1 (up to 25.25m and 60t), Germany for 4 to 8 million euros (mainly dedicated to strengthening bridges and expanding parking areas) and Switzerland calculated in 2011 that the costs of adapting the national road network to accommodate HCVs of up to 60 tons would range between 144 to 450 million euros (mainly for the reinforcement of bridges). More recently, on 22 December 2021, Denmark has published the results of their trial for “double trailers”, i.e. EMS of up to 34m and 70t composed of a tractor and two long trailers. According to their research they estimate a necessary investment in the infrastructure of 4.8M€ and a socio-economic return of 40M€ over 15 years.

<sup>55</sup> To assess the magnitude of the impacts of the current legal framework on the market segments, the supporting study analysed a harmonisation scenario for the rules on weights and dimension of HDV in the EU. In this scenario (scenario 0) the rules of weights and dimensions were restricted to those limits laid down in the W&D Directive and national derogations or flexibility in national or international transport was not allowed. The road safety impacts of this scenario as regards the market segment of HCV are limited to the 9 Member States that currently allow the circulation of EMS. The estimations have taken into account the transport level corresponding to year 2018.

#### ***1.4.2. Indivisible loads/abnormal transport***

For the application of the WDD, an indivisible load is defined as the “*load that cannot, for the purpose of carriage by road, be divided into two or more loads without undue expense or risk of damage and which owing to its dimensions or mass cannot be carried by a motor vehicle, trailer, road train or articulated vehicle complying with Directive 96/53/EC*”.

This definition comprises the vehicles (or vehicle combinations) destined to transport such indivisible loads, when they necessarily exceed the limits set up in the Weights and Dimensions Directive for the purpose of the carriage. Thus, experts refer to this market segment as “abnormal transports”<sup>56</sup>, rather than “indivisible (or abnormal) loads”.

This market segment represents a small portion of the freight transport market<sup>57</sup> which is dominated by ordinary transport (and vehicles) fitting within the maximum weight and dimension limits set nationally and at EU level. Its relevance comes, however, from its connection with the strategic areas of renewable energy, civil engineering and infrastructure, oil and gas, heavy industry and power generation sectors as it enables transporting indivisible loads, such as wind turbines and their blades, bridge beams, pre-built homes, electric transformers, heavy coils, chemical reactor vessels and airplane fuselages or wings<sup>58</sup>.

According to the supporting study, Inland Waterways (IWW) and railways constitute a good alternative to the transport of indivisible loads. They are suitable for the transportation of heavier and/or more cumbersome cargo, while the final and/or the initial leg is usually transported by road. In addition, road safety aspects may require additional measures, such as road closures or police escorts, particularly for exceptionally big indivisible loads, increasing the cost and decreasing the attractiveness of the road transport. Member States can also limit the road leg of those indivisible loads to the minimum indispensable to carry out the delivery. The transport mode can be therefore influenced by the price, but the actual feasibility of the transport operation is a determining factor.

##### *Specific requirements*

The need to authorise the circulation of abnormal road transport is recognised by the Directive, which requires an exemption or a special national permit prior to carrying out the road transport operation. According to article 4(3) of the Directive “*Vehicles or vehicle combinations which exceed the maximum dimensions may only be allowed to circulate on the basis of special permits issued without discrimination by the competent authorities, or on the basis of similar non-discriminatory arrangements agreed on a case-by-case basis with those authorities, where these vehicles or vehicle combinations carry or are intended to carry indivisible loads*”.

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<sup>56</sup> Abnormal road transport is technically defined as a vehicle or vehicle combination, having either no load or an indivisible load, which can only be transported by exceeding at least one of the dimensions and/or axle, bogie or total weights authorised by Directive 96/53/EC and national legislation (“European Best Practice Guidelines for Abnormal Road Transports”, 2008, European Commission Directorate-General for Energy and Transport).

<sup>57</sup> According to the European association of abnormal road transport and mobile cranes (ESTA) the yearly turnover of the industry amounts € 24 billion.

<sup>58</sup> <https://estaurope.eu/industry/abnormal-road-transport/>

This regime of national permits responds to the need of Member States to verify that the abnormal road transports are moved safely and that they have a minimum impact on other road users and the infrastructure. Public authorities need to attest that the road infrastructure, particularly bridges and road crossings, on the given route can accommodate often heavier than normal axle and vehicle loads, as well as the extra dimensions. This assessment leads to the imposition of restrictions, limiting the transport to a part of the road network or even to a specific route and time, as well as to the requirement of additional measures, such as police or private escort to perform the abnormal road transport, in certain cases.

In most cases Member States have established several thresholds of excesses in weights and dimensions for which they issue different types of permits. In general, there are two types of national permits:

- 1) **Long-term permits** for the lowest threshold, granted for a period of time (generally from 6 to 12 months) during which the abnormal transport is allowed anywhere in a given part of the network, for an unlimited number of circulations, under less restrictive conditions.

This type of permits are commonly used to authorise the circulation of EMS<sup>59</sup> too, limiting their use to the part of the network where they can circulate safely.

- 2) **One time/one route permits**, issued on a case-by-case basis, limiting the abnormal transport to the use of a particular route(s) for a limited number of trips, generally one trip on a predetermined date and time. This second type corresponds to the highest excesses in weights and/or dimensions and are subject to more restrictive conditions, e.g. private or police escorts.

National rules vary significantly between Member States as regards the number of thresholds and the conditions assigned to each type of permit. Those rules are influenced by historical factors, peculiarities of the market and the condition of the road network. These different rules and procedures might cover vehicle escorts (one or two pilot vehicles, private or police escorts); time frames allowed and authorised speeds; lighting and signalling requirements; required vehicle information documents; and abnormal road transport application forms. In addition, in some Member States the procedures for obtaining indivisible load permits are decentralised and hauliers must apply to a variety of authorities within a single Member State. This results in inefficiencies, delays and difficulties for hauliers in meeting very specific regulations (EC, 2008)<sup>60</sup>.

### Challenges

The transport of indivisible loads faces the following challenges:

- **Lack of standard equipment and rules:** different requirements with respect to vehicle dimensions, overhangs, axle weights and spacing, allowed circulation days/times, escorts, recommended marking and signalling, etc.

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<sup>59</sup> With the exception of the Northern countries where no permit is required.

<sup>60</sup> European Best Practice Guidelines for Abnormal Road Transports”, 2008, European Commission Directorate-General for Energy and Transport.

- **Complex and varying national procedures:** the variety of procedures across Member States and the frequent lack of support in a common accepted language increases national hauliers expenses, which have to resort to third parties mediating between the haulier and the competent authority.
- **Time needed to issue permits:** according to the road transport operators the time for issuing a national permit varies from 1-2 weeks to up to 12 weeks depending on the Member State issuing the authorisation, the selected route or the period of validity of the permit. Recurring delays can result in costs and penalties (e.g. demurrage claims) or lost revenues and agreements both for carriers and shippers.
- **Route selection and check:** whenever predefined corridors have not been identified, routes must be selected by the applicant to apply for the authorisation of a given abnormal transport. Furthermore, some countries also require outlining at least one alternative path. This results in the time-consuming activity of repetitive check operations by national and local authorities, and consequent delays.
- **Escorts:** currently, each Member State has its own escort regimen (police, private or both) and the need for that depends on vehicle weight/dimensions as well as on the technical characteristics of the selected path and the features of the load. In some Member States, the police do not escort abnormal road transports, apart from cargoes of extreme weight/dimension. Private escorts usually require authorisation, and some Member States do not allow private escorts without involving the national police.

All these challenges also increase the risk of illegal transport, particularly of one-time abnormal transport. It is estimated that 25% of such transport in the EU is not covered by special permits, adversely affecting road safety and the conditions and maintenance of the infrastructure.

#### Non-legislative measures

To address the challenges faced by abnormal transport, the Commission Expert Group, elaborated and adopted in 2008 the European Best Practice Guidelines for Abnormal Road Transports<sup>61</sup> (BPG). The Guidelines received the positive opinion of the Road Safety High Level Group. They were primarily addressed to the public authorities in the Member States.

The main recommendations of the BPG were:

- The **one-stop-shop** principle with respect to granting abnormal road transport permits. The BGP recommended to appoint a single authority per Member State to handle the permission request, without prejudice of the internal involvement of other competent authorities at national or regional levels. The internal procedures would be then transparent to the applicants, which only had to deal with one authority, providing them with clarity and facilitating the administrative process.
- The **Special European Registration of Trucks and Trailers (SERT) Document:** A single document that covers the needs of the different national authorities as regards detailed vehicle information that is not available on the registration certificate and for which most countries have developed their own information documents (the majority not

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<sup>61</sup> European Commission, Directorate-General for Energy and Transport, Abnormal road transports: European best practice guidelines, Publications Office, 2008. Available at <https://op.europa.eu/en/publication-detail/-/publication/fa2d050b-24d2-469c-af61-43838653f075>

recognising the validity of the documents emitted in a different Member State). The BPG proposed a concrete format for the SERT document, with the aim to harmonise the technical vehicle information needed both for trailers and tractive units (tractors and lorries). This document would ideally develop into an electronic format making the information available on-line for the national authorities.

- The creation of **abnormal road corridors** across the EU allowing passage rights to abnormal road transports that meet certain pre-defined criteria (namely, minimum dimensions and height as defined in the BPG). The objective was to facilitate cross-border operations for abnormal road transports in order to foster EU economic growth. This recommendation was in line with the current practice of granting long-term permits, for which Member States have identified and pre-classified routes for abnormal road transports. The information on the parts of the road network classified as adequate for the carriage of abnormal loads under certain thresholds should be kept up to date and be readily accessible to the stakeholders.
- Conditions imposed by the national permits: **Marking/lighting of vehicle and load, and escorts**. The BPG made also recommendations to harmonise (also avoiding language problems) the safety requirements imposed to abnormal transports by national authorities to avoid accidents. Commonly agreed and recognisable marking and lighting or minimum training for escort drivers and traffic directors on key areas with were some examples.

Although the BPGs offered a list of rules and procedures that could promote a more harmonised approach, safer operations and improved transparency and despite the consensus reached by Member States at the time of their adoption, the BPG have barely been followed by Member States. No progress has been made as regards the implementation of the SERT document<sup>62</sup> nor the abnormal transport corridors and only a few Member States have fully implemented the one-stop-shop principle.

In 2011 the European association of abnormal road transport and mobile cranes (ESTA) conducted an Economic Impact Assessment and concluded that, if all recommendations of the BPG were followed, the savings could amount to €800 million every year<sup>63</sup>.

#### ***1.4.3. Vehicles with special equipment***

This segment comprises vehicles equipped with special equipment, generally installed on standard vehicles, with the purpose to perform special tasks, converting the vehicle into a machine or tool. Its primary function is not transporting goods as such, but performing specific tasks for commercial or industrial purposes. Some examples are trucks equipped with retractable cranes to facilitate loading and unloading of its own cargo, mobile cranes, vehicles equipped with supporting legs to provide stability, truck-mounted forklifts, vehicles with a dredge pump and trucks equipped with a compactor. Special equipment like tow trucks and trucks designed for the removal of broken-down vehicles are excluded from this market segment.

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<sup>62</sup> Only issued by The Netherlands, it is recognised in other 5 Member States.

<sup>63</sup> According to the Economic Impact Assessment this amount was desegregated as follows: 1) Efficiency improvement: € 50 million; 2) Corridors: € 30 million; 3) Introduction of SERT: € 270 million; 4) Private escorts replacing police effort: € 450 million. These figures have been confirmed by ESTA during the stakeholder's consultation in the course of the supporting study.

*Figure 9. Illustrations of typical vehicles included in the segment (truck mounted forklift, foldable cranes and support legs).*



The special equipment adds to the weight of the vehicles as well as to its dimensions (generally the length).

A large proportion of the cargo transported by the vehicles, such as materials for the construction industry, is not transported over long distances, which limits their use in most cases to national transport, with some exception for cross-border regions and geographically small Member States. Often, deliveries are made from a distribution centre (or the retailer of the cargo) to the final user with the aid of the retractable crane or the mounted forklifts to unload and deliver the cargo. The transport between the producer and the retailer is generally undertaken by truck/trailer combinations, which transport larger amounts of cargo more efficiently.

#### Specific requirements

Directive 96/53/EC does not particularly regulate vehicles with special equipment. In effect, these vehicles must comply with the maximum weights and dimensions authorised for standard vehicles.

Likewise, they are subject to the type-approval legal framework<sup>64</sup>, aimed at ensuring the proper functioning of the internal market and to offer a high level of safety and environmental performance. These rules are particularly relevant to make sure that road safety is not compromised, e.g. due to the addition of sharp edges or equipment attached to the rear of the vehicle that could reduce the effectivity of underrun protections.

Member States may decide not to allow the circulation on the road, the placing on the market, the registration or the entry into service of vehicles that have been type-approved in

<sup>64</sup> Regulation (EU) 2018/858 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles (OJ L 151, 14.6.2018, p. 1), and Regulation (EU) 2019/2144 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users, (OJ L 325, 16.12.2019, p. 1).

accordance with the Regulation (EU) 2018/858, but that exceed the harmonised dimensions, weights and axle loads laid down in the WDD.

Some Member States have made use of the possibility, foreseen in article 39 of Regulation (EU) 2018/858, of granting an EU type-approval for vehicles that are incompatible with one or more of the type-approval requirements but that incorporate new technologies or new concepts. Such EU type-approval would be provisional and with validity limited to the territory of the Member State of the approval authority (although other Member States can accept them), pending the authorisation of the European Commission.

The evidence collected by the supporting study did not provide an overview of the national exemptions and national rules applicable to vehicles with special equipment, but as a way of an example it presented the Danish case where truck-mounted forklift are not considered as part of the vehicle. They are generally allowed without a specific permit, but must respect national rules related to the positioning of the system, its operational rules and road safety features. According to information provided by the interviewed haulier organisations during the supporting study, this is a general practice in most EU countries.

### Challenges

Truck-mounted equipment in most cases adds to the length and weight of the vehicles. In the absence of EU type-approval or national exemptions vehicles with special equipment must comply with the standards set in the Weights and Dimensions directive. When excesses in weights and dimensions are admitted they are also subject to specific rules that may vary among Member States.

Differences across Member States concerning how the special equipment is considered (i.e. part of the vehicles or not), as well as the national rules imposed to those vehicles are a barrier to their international operation and can reduce the efficiency of the use of those vehicles. However, the limitations to the international operation of vehicles with special equipment are not perceived as a relevant issue by stakeholders.

#### ***1.4.4. Transport of vehicles***

Transportation of vehicles makes use of almost all modes of transport, from short and deep-sea shipping, inland waterways, rail and road transport. Road transport is used in different parts of the finished vehicle logistics chain from manufacturer locations to dealers, but it contributes mainly to supply the sale networks and end-customer distribution. Depending on the complexity of the logistics chain, starting from vehicle manufacturer, road transport is used to move finished vehicles from/to ports, intermodal terminals and distribution centres. Other modes of transport are also used in the same parts of the outbound logistics. For instance, rail transport is used to move a high volume of finished vehicles, mainly from manufacturers to distribution centres (vehicle compounds). However, road transport is necessary to reach final destinations.

The passenger car segment constitutes the largest part of the transportation of vehicles, but it also includes light commercial vehicles, heavy duty vehicles, trailers, semi-trailers as well as specialised vehicles (i.e. pavement roller machines), which are usually transported as indivisible loads or, if possible, in containers. The scope of this report covers the transportation of motor vehicles, trailers and semi-trailers by means of car carrier vehicles,

i.e. the transport of vehicles that cannot be handled by car carriers are not considered as part of this market segment.

Transportation of vehicles is undertaken using vehicles combinations (tractor unit with semi/trailer) also known as car hauler or vehicle transporter. They are equipped with a double decker, subdivided into several sections and usually equipped with in-built ramps for loading and unloading the vehicles, as well as extendable decks or a combination of front and rear overhangs to extend their length capacity. They can be open or enclosed.

### Specific requirements

Vehicle transporters are not recognised by the WDD as a specific category of vehicles and no reference is made in the Directive to loaded length, load overhangs or the use of rear extension devices. Vehicle transporters are subject to the standards set in the Directive, in particular:

- Maximum length of trailer: 12.00m
- Maximum length of road train: 18.75m
- Maximum height: 4.00m
- Maximum weight of road trains with five or six axles: 40 tonnes.

Vehicle transporters remain comfortably below the maximum authorised weight of 40 tons. The critical standards for them are the maximum authorised length and, to a lesser extent, the maximum height,

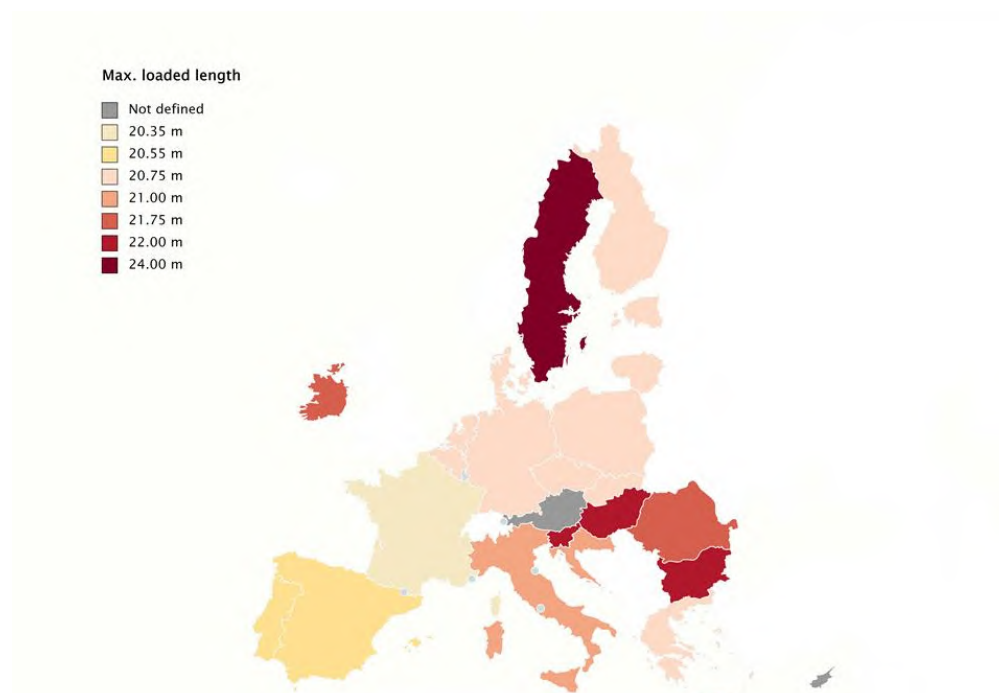
Front and rear overhangs are commonly authorised by national authorities to increase the loading capacity of the vehicle transporters, exceeding the maximum length set in the Weights and Dimensions Directive when they are fully loaded. All Member States, except one<sup>65</sup>, foresee this possibility and they do so via the introduction of a new concept: the maximum “loaded” length. The extended loaded length for vehicle transporters vary from 20m to 24m and it is even unlimited in some Member States. The most common loaded length is 20.75m, currently allowed, as a minimum standard, in 22 Member States<sup>66</sup>. The national rules also vary as regards how to reach the maximum loaded length: some Member States allow both front and rear overhangs, others allow only one of them, while some national legislation does not mention vehicle extensions at all. A general representation of the national limits is presented in the figure 10 below.

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<sup>65</sup> Malta is the only Member State that does not allow increased loading capacity of vehicles transporters.

<sup>66</sup> In Malta the maximum length of car carrier vehicles remains at the limit of 18.75m. Luxembourg allows a loaded length of up to 20m, Spain and Portugal up to 20.35m and France up to 20.55m.

*Figure 10. Maximum loaded length of car transporters in meters in Europe based on national legislation. Source: ECG*



Car carriers can also make use of high capacity vehicles (HCV). That is the case of the vehicle carriers used by Seat to cover the 35Km between their vehicle factory in Martorell and the port of Barcelona, for which they use an open EMS of 25.25m long. According to Seat this increases their daily productivity by 12%, reduces the CO2 emissions by 10% per journey and the logistics costs by 11%<sup>67</sup>.

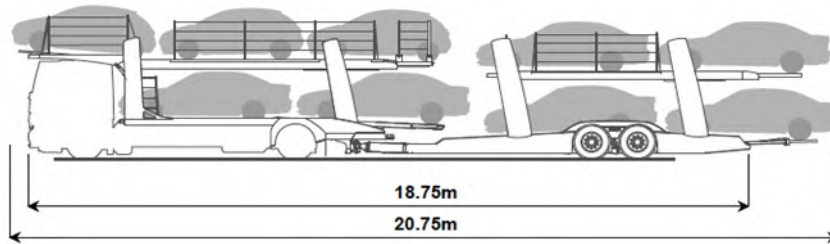
### Challenges

Patchwork of national rules and the lack of recognition in EU law of an increased “loaded” length makes it difficult for hauliers to engage efficiently in cross-border carriage of vehicles.

Vehicle transporters crossing a border are required to comply with a maximum length that is in most cases lower than the (loaded) length allowed in the Member State of origin. This reduces the loading factor, increasing the number of vehicle carriers necessary to transport the same amount of vehicles. As represented in the image below, in the case of passenger cars the variation between the standard length of 18.75m and 20.75m changes the loading capacity from 7 to 9 vehicles transported. The reduced length and thus loading capacity has adverse effects on the efficiency of the transport operations, and on the potential to reduce the CO2 emissions and alleviate other negative effects per tonne/unit transported (e.g. road accidents, congestions).

<sup>67</sup> <https://www.caranddriver.com/es/movilidad/a36995109/megatruck-camion-trailer-seat/>

Figure 11. Number of passenger vehicles transported by a vehicle carrier with lengths of 18.75m and of 20.75m



The open structure of vehicle transporters poses a challenge as regards the improvement of the energy performance. Aerodynamic devices and cabs are not considered for these type of vehicles, which can only rely on the optimisation of the cargo and on more efficient and cleaner powertrains to reduce fuel consumption and greenhouse gas emissions.

#### ***1.4.5. Military transport***

Military operations entail a significant amount of transport to carry military personnel and assets, including military vehicles with special equipment (heavy trucks, armoured vehicles, tanks, etc.).

Military mobility includes movements planned well in advance of the actual operation as well as movements that arise on short notice during military exercises and in crisis situations, covering from day-to-day transportation needs to strategic pre-deployment of military forces and resources. Transport can be undertaken by the military forces themselves or be entrusted to civil transport operators.

Most military movements are undertaken within a Member State's own territory, but international collaboration, requiring cross-border operations and transportation, is paramount to ensure the defence of the EU and its citizens through swift and effective deployment of military forces.

#### ***Specific requirements***

Member States have full sovereignty to decide whether troops from another Member State can enter their territory. As signalled by the Commission Joint Communication on Improving military mobility in the European Union<sup>68</sup>, due to its specific status, military mobility is bound by a wide range of national decisions, but also of EU rules, in the areas of customs, home affairs, justice, transport, defence, economy and finance, labour, environment and health.

In the area of road transport, military transport is bound by the requirements for safe and secure transport of persons and military equipment, including the transport of dangerous goods, and by the availability and adequacy of the transport infrastructure, for which the extra height and extra weight of military vehicles can be challenging.. The Weights and

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<sup>68</sup> JOIN(2017)41 final.

Dimensions Directive only applies to HDVs<sup>69</sup> as defined in the type approval framework and Regulation (EU) 2018/585<sup>70</sup>, which lays down the administrative provisions and technical requirements for the type-approval of all new vehicles, expressly excludes military vehicles from its scope.

However, the transport of military equipment and military vehicles and troops can be carried out by means of standard (type-approved or individually-approved) HDVs. In such cases, the (civil) transport has to comply with the requirements set in the Weights and Dimensions Directive, including the national schemes for the authorisation of the carriage of indivisible loads when exceeding the maximum dimensions set in the directive, as well as the national limits for the maximum authorised weight and axle weight.

### Challenges

In order to protect the Union and its citizens the EU needs to ensure its ability to react effectively and in timely manner to internal and external crisis situations. As identified in the Commission Joint Communication Improving military mobility in the European Union<sup>71</sup> *“the rapid and swift movement of military personnel and equipment across the EU is currently hampered by a number of physical, legal and regulatory barriers, such as infrastructure that cannot support the weight of a military vehicle or cumbersome customs and other procedures. As experienced during major military exercises such barriers lead to delays, disruptions, higher costs and increased vulnerability”*.

The first *EU Action Plan on military mobility*<sup>72</sup> was adopted in March 2018 to address and remove the obstacles that hamper military mobility in the EU. The plan was complemented by annual progress reports that informed the European Parliament and the Council about the implementation of the Action Plan<sup>73</sup>. In November 2022, the EU Action Plan on military mobility 2.0<sup>74</sup> was adopted. The Action Plan 2.0 builds on the progress made since the military mobility initiative was launched in 2017<sup>75</sup>, and opens the next chapter of work on military mobility for the period 2022-2026. Enlarged in scope and proposing additional measures, it will contribute to a well-connected military mobility network, with shorter reaction times and capable, secure, sustainable and resilient transport infrastructure and capabilities.

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<sup>69</sup> According to article 1.1(a) of Council Directive 96/53/EC, this directive only applies to vehicles in categories M2, M3, N2, N3 and their trailers in categories 03 and 04, as defined in Annex II of Directive 2007/46/EC, establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles (OJ L 263, 9.10.2007, p. 1–160). Directive 2007/46/EC was repealed by Regulation (EU) 2018/585.

<sup>70</sup> Regulation (EU) 2018/585 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC. Consolidated text available [here](#).

<sup>71</sup> JOIN (2017)41 final.

<sup>72</sup> Joint Communication to the European Parliament and the Council on the Action Plan on Military Mobility JOIN (2018)05 final, referred to as the "Action Plan".

<sup>73</sup> The most recent progress report is the Joint report to the European Parliament and the Council on the implementation of the Action Plan on Military Mobility from October 2020 to September 2021. JOIN(2021)26 final.

<sup>74</sup> Joint Communication to the European Parliament and the Council on the Action Plan on military mobility 2.0 JOIN(2022) 48 final, referred to as the “Action Plan 2.0”.

<sup>75</sup> JOIN (2017)41 final.

A key part of the first Action Plan was to identify the infrastructure that is capable of accommodating larger and heavier vehicles than those within the limits of the WDD. A gap analysis<sup>76</sup> between the military requirements adopted in Council<sup>77</sup> and the trans-European transport network was conducted in 2018 to this end, assessing to what extent the geographical military transport network overlaps with the TEN-T. The result was that the dual-use network (where the military network and the TEN-T overlap) and the military network overlap up to 93 %. This means that only 7% of the military network lies outside of the dual-use part of the TEN-T.

Regarding the technical infrastructure requirements, the gap analysis concluded that the civilian requirements in several cases are lower than the military requirements for the roads. The military requirements are in other words in most cases higher in comparison to those of the EU Weights and Dimensions Directive.

Civil abnormal transport can also benefit from this gap analysis, given that there may be overlaps between the infrastructure requirements for the military vehicles and those for the large, heavy modular vehicles (HCVs and EMS), as well as for the vehicles transporting indivisible loads, including loads of military nature.

To which extent the TEN-T corridors are also adequate for use of HCVs could be investigated as the TEN-T network might be well suited for the large vehicles, which are operating at long distances between EU Member States.

The easy cross-border military movements have also been addressed within the remit of the European Defence Agency Programme on “Optimising Cross-Border Movement Permission Procedures in Europe”. According to the 2020 progress report about the implementation of the Military Mobility Action Plan this work has progressed and a first draft of technical arrangements has been prepared and will be further developed by technical experts from the 25 participating Member States. The work to reinforce military mobility by improving cross-border mobility and other administrative procedures is continuing under the Action Plan 2.0.

The analysis undertaken as part of the supporting study indicates that administrative cost savings can be obtained from harmonisation of permission procedures as for indivisible loads, but the magnitude of the cost savings are not likely to be large compared to the other segments.

## **REFLECTION AND OUTLOOK**

The EU rules on weights and dimensions of heavy duty vehicles play an important role in promoting the safe and efficient operation of these vehicles on EU roads, while also protecting the environment and road infrastructure.

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<sup>76</sup> SWD(2019) 175 final

<sup>77</sup> Military Requirements for Military Mobility within and beyond the EU, 11373/19

The expected growth of the European freight transport market over the next decades and the environmental challenges call for measures aimed at boosting further the efficiency, sustainability and resilience of road transport by HDVs. Efforts should continue to exploit synergies between market segments and to adapt the current legal framework to the technological developments, demands and capability of the market, as well as to better serve the greening and safety objectives of the transport policy.

**Annex 1 : Overview of national regulations on weight and dimensions under Directive 96/53/EC.**

Country	Category	Max. length	Max. weight
<b>Austria</b>	General HDV use	18.75	40/44
<b>Belgium</b>	General HDV use	18.75	44/44
	50 t in two cases: 1) articulated vehicles consisting of a three-axle tractor and a three axle semi-trailer; 2) trains of vehicles consisting of a motor vehicle with three or more axles and a trailer with three or more axles, with certain additional conditions		50
	HCV are can be used to use on selected parts of the network in Flanders as part of a trial	25.25	60
<b>Bulgaria</b>	General HDV use	18.75	40
<b>Croatia</b>	General HDV use	18.75	40/44
<b>Cyprus</b>	General HDV use According to Volvo, the maximum weight is 46t. It could not be confirmed by other sources.	18.35	31
<b>Czech Republic</b>	General HDV use	18.75	48
	A <b>trial</b> with HCV is initiated on preselected routes on motorways	25.25	48
<b>Denmark</b>	General HDV use. Up to 56 tonne for vehicles with 7 axles and special use	18.75	40/56
	A dedicated network has been laid out for HCV, mostly covering motorways and a number of other highways, including connections to transport hubs. The system is a trial-based system running until 2030.	25.25	60
<b>Estonia</b>	General HDV use	18.75	44
	Timber transport (depending on the number of axles)	25.25	52
<b>Finland</b>	Up to 76 tonnes on the main network has been allowed since 2013.	34.50	76
	Testing units up to 34m and a total weight of 104 tons.	34.50	104
<b>France</b>	General HDV use	18.75	44
<b>Germany</b>	General HDV use	18.75	40/44
	HCV units up to 25.25m can be used on a limited network in Germany.	25.25	40/44
	A special type 1 HCV tractor/semitrailer can use the entire network.	17.88	40/44
<b>Greece</b>	General HDV use	18.75	42/44
<b>Hungary</b>	General HDV use	18.75	40/44
	24m for lorries with two trailers		

Country	Category	Max. length	Max. weight
<b>Ireland</b>	General HDV use	18.75	40/44
	Additional weight (above 40/44 tonnes) is allowed if vehicles are fitted with additional safety equipment (brakes etc.). The same applies to certain restrictions for longer vehicles, but this is not HCV.	22.00	46
<b>Italy</b>	Transport of vehicles, transport of strawberry rolls, transport of ISO containers	+12%	44
	Articulated vehicles	18.00	44
	Excavation and mining materials	18.75	56
<b>Latvia</b>	General HDV use	18.75	44
<b>Lithuania</b>	General HDV use	18.75	40/44
<b>Luxembourg</b>	General HDV use	18.75	44
<b>Malta</b>	General HDV use	18.75	40/44
<b>Netherlands</b>	General HDV use	18.75	50
	HCV has been allowed on a permanent basis since 2011.	25.25	60
<b>Poland</b>	General HDV use	18.75	40/44
<b>Portugal</b>	General HDV use	18.75	40/44
	HCV are in regular service on a dedicated network based on a permit system, where you need a permit for a specific route.	25.25	60
	Articulated vehicles with wood, paper and ceramic products	18.75	60
<b>Slovenia</b>	General HDV use	18.75	40/44
<b>Slovakia</b>	General HDV use	18.75	40/44
<b>Romania</b>	General HDV use	18.75	40/44
<b>Spain</b>	General HDV use	18.75	40/44
	HCV (25.25m) are in regular service on a dedicated network based on a permit system, where you need a permit for a specific route and a specific vehicle.	25.25	60
	Currently <b>testing</b> operation of 32m vehicles	32.00	60
<b>Sweden</b>	General HDV use	25.25	44
	Vehicles for transport of timber	25.25	60 (64 with 8 axles)
	Sweden is currently <b>testing</b> operation of 32m long and up to 90 tons vehicles in timber transport.	32.00	90

*Sources: ITF-OECD, Volvo, CEDR and road authority official webpages.*

*HDV: Heavy-duty vehicles*

*HCV: High Capacity Vehicles*

**Annex 2: Number of HCV in use in the Member States as compared to the total HDV fleet and magnitude of the transport they represent.**

Country	Number of vehicles used for HCV	Total number of HDV registered <sup>78</sup>	Tonnes/Tkm lifted using HCV	Total HDV tonnes <sup>79</sup> /Tkm lifted	Veh.km with HCV	Total HDV Veh.km. <sup>80</sup>
<b>Denmark<sup>81</sup></b>	1100 <sup>82</sup>	42,505	1.34 bn tkm <sup>83</sup>	162 mt / 12,058 bn tkm	137 million <sup>84</sup>	1.256bn
<b>Czech Republic</b>	61	264,959	n.a.	479.2 mt 41,073 mtkm	n.a.	n.a.
<b>Germany</b>	200 <sup>85</sup>	531,849	n.a.	3,078.2 mt 276,151 mtkm		107.7bn
<b>Netherlands</b>	5,975 <sup>86</sup>	62,963	3% of tkm <sup>87</sup>	547.3 mt 34,295 mtkm		18.493bn
<b>Belgium</b>	80 <sup>88</sup>	96,690	n.a.	233.2mt / 20,592 mtkm		12.618bn
<b>Sweden</b>	n.a.	70,617	33bn tkm (90% of total) <sup>89</sup> 338.0 mt and 36,710 mtkm <sup>90</sup>	475.5 mt / 40,662 mtkm	1,967 bn <sup>91</sup>	2.958bn <sup>92</sup>
<b>Finland</b>	n.a.	155,868	18 bn tkm (73% of total) <sup>93</sup>	270.7 mt 25,970 mtkm	n.a.	n.a.

<sup>78</sup> Eurostat, 2018 figures. All trucks (figures from Denmark come from Statistics Denmark)

<sup>79</sup> Eurostat, 2018 figures, national transport (figures from Denmark come from Statistics Denmark).

<sup>80</sup> Eurostat, 2018 figures, national transport (figures from Denmark come from Statistics Denmark).

<sup>81</sup> Statistics Denmark, national transport using DK vehicles on Danish territory. Trailer-tractor and road trains more than 44 tonnes. However, the number also includes normal road trains.

<sup>82</sup> Assessed by Statistics Denmark and confirmed by ITD (Danish international road haulier association).

<sup>83</sup> Based on an updated estimate of the 2011 figures with a factor of 3.5. Own calculations.

<sup>84</sup> 2019 estimate.

<sup>85</sup> Eleflein Rüdiger, January 2020

<sup>86</sup> RWS.NL interview

<sup>87</sup> 2011 figures. "A Review of megatrucks" 2013, DG Transport and Tourism. The number was gradually increasing from 2002 to 2011.

<sup>88</sup> Flanders numbers (61 EMS) correspond to July 2020 and Wallonia numbers (19 EMS) to 2018.

<sup>89</sup> "A Review of megatrucks" 2013, DG Transport and Tourism

<sup>90</sup> Trafikanalys (2019). Official Swedish transport statistics. Vehicles above 44 tonnes gross weight.

<sup>91</sup> "A Review of megatrucks" 2013, DG Transport and Tourism

<sup>92</sup> "A Review of megatrucks" 2013, DG Transport and Tourism

Country	Number of vehicles used for HCV	Total number of HDV registered <sup>(78)</sup>	Tonnes/Tkm lifted using HCV	Total HDV tonnes <sup>(79)</sup> /Tkm lifted	Veh.km with HCV	Total HDV Veh.km. <sup>(80)</sup>
<b>Spain</b>	889 <sup>94</sup>	342,957	n.a.	1,392 mt 158,476 mtkm	n.a.	23.397bn
<b>Portugal</b>	n.a.	51,908	n.a.	131.5 mt 10,530 mtkm	n.a.	n.a.

*Notes:*

*Number of vehicles used for HCV: Describes the number of vehicles (full combinations) operating as HCV*

*Total number of HDV registered: Total number of trucks (single and truck/trailer combinations) including HCV's*

*Tonnes/Tonnes kilometres lifted using HCV: Transported tonnes and produced tonnes km (tons\*km) by HCV*

*Total HDV tonnes/Tonnes kilometres lifted: Same as previous for all trucks*

*Vehicle kilometres with HCV: Kilometres (empty/loaded) by traction/tractor units in HCV combinations*

*Total HDV vehicle kilometres: As previous for all HDV*

<sup>93</sup> Trafikanalys (2019). Official Swedish transport statistics. Vehicles above 44 tonnes gross weight.

<sup>94</sup> Source: 2019 figures by DGT, Spain.

### Annex 3 : National rules applicable to vehicle transporters in the EU

Member State	Mentioned in national legislation <sup>95</sup>	Max. unloaded length	Max. loaded length	Front overhang permitted	Rear load overhang permitted	Rear extension permitted in law
<b>Austria</b>	Yes	18.75	Above 18.75 but not defined	Not defined	Yes (up to 1/4 of the vehicle)	Yes (only to stabilize the overhang of the load)
<b>Belgium</b>	Yes	18.75	20.75	Yes (up to 0.5m)	Yes (up to 1.5m)	Yes (not beyond the load)
<b>Bulgaria</b>	No	Not defined	22.00	Not defined	Not defined	Not defined
<b>Croatia</b>	Yes	Not defined	21.00	Yes (up to 1m)	Yes (up to 1/6 of the last vehicle loaded)	Not defined
<b>Cyprus</b>	No	18.75	Above 18.75 but not defined <sup>96</sup>	Not defined	Not defined	Not defined
<b>Czech Rep.</b>	Yes	Not defined	20.75	Not defined	Yes (within the loaded length)	Not defined
<b>Denmark</b>	Yes	18.75	20.75	Not defined	Yes (within the loaded length)	Not defined
<b>Estonia</b>	Yes	18.75	20.75 <sup>97</sup>	Not defined	Not defined	Not defined
<b>Finland</b>	No	Not defined	20.75	Yes (up to 1m)	Yes (up to 2.0m)	Not defined
<b>France</b>	Yes	18,75	20.35	No	Yes (up to 1.6m)	Yes (not beyond the load)

<sup>95</sup> Specific recognition of car carried in the national legislation

<sup>96</sup> The permissible overhang of a load transported by a vehicle is equal to 10% of the total length of the 'rigid vehicle' (not combinations of vehicles).

<sup>97</sup> Front and rear overhang are not defined in law but permitted in practice up to 2m.

Member State	Mentioned in national legislation <sup>95</sup>	Max. unloaded length	Max. loaded length	Front overhang permitted	Rear load overhang permitted	Rear extension permitted in law
<b>Germany</b>	Yes	18.75	20.75	Yes (up to 0.5m)	Yes (up to 1.5m)	Yes (not beyond the load)
<b>Greece</b>	Yes	18.75	20.75	Yes (up to 0.5m)	Yes (up to 1.5m)	Yes (not beyond the load)
<b>Hungary</b>	No	18.75	22.00	No	Yes (within the loaded length)	Not defined
<b>Ireland</b>	No	Not defined	21.75	Not defined	Yes (up to 1m)	Not defined
<b>Italy</b>	Yes	18.75	21.00 <sup>98</sup>	Not defined	Not defined	Not defined
<b>Latvia</b>	Yes	18.75	No limit <sup>99</sup>	Not defined	Not defined	Not defined
<b>Lithuania</b>	Yes	18.75	20.75 <sup>100</sup>	Not defined	Not defined	Not defined
<b>Luxembourg</b>	No	Not defined	20.00	Not defined	Not defined	Not defined
<b>Malta</b>	No	18.75	18.75	No	No	No
<b>Netherlands</b>	Yes	Not defined	20.75	Yes (up to 0.5m)	Yes (up to 2m)	Not defined
<b>Poland</b>	No	Not defined	20.75	Yes (up to 0.5m)	Yes (up to 2m)	Yes (not beyond the load)
<b>Portugal</b>	Yes	18.75	20.55	Not defined	Yes (within the loaded length)	Not defined
<b>Romania</b>	No	18.75	21.75 <sup>101</sup>	Not defined	Not defined	Not defined
<b>Slovakia</b>	Yes	Not defined	20.75	Not defined	Not defined	Not defined

<sup>98</sup> Vehicles can exceed up to 12% of vehicle length.

<sup>99</sup> Legislation only specifies the unloaded length for car carriers. The Latvian Ministry of Transport interpreted this as no limitation to the loaded length.

<sup>100</sup> The legislation does not differentiate between front and rear overhangs but set a maximum length of 2m.

<sup>101</sup> When exceeding 18.75m, the vehicle is subjected to Special Transport Authorisation, STA, which incurs a fee.

Member State	Mentioned in national legislation <sup>95</sup>	Max. unloaded length	Max. loaded length	Front overhang permitted	Rear load overhang permitted	Rear extension permitted in law
<b>Slovenia</b>	Yes	Not defined	22.00	No	Yes (up to 1.5m)	Not defined
<b>Spain</b>	Yes	18.75	20.55	No	Yes (up to 1.8m)	Yes (not beyond the load)
<b>Sweden</b>	No	Not defined	24.00	Not defined	Not defined	Not defined