

## IRU position on the wider and international use of Eco-Trucks

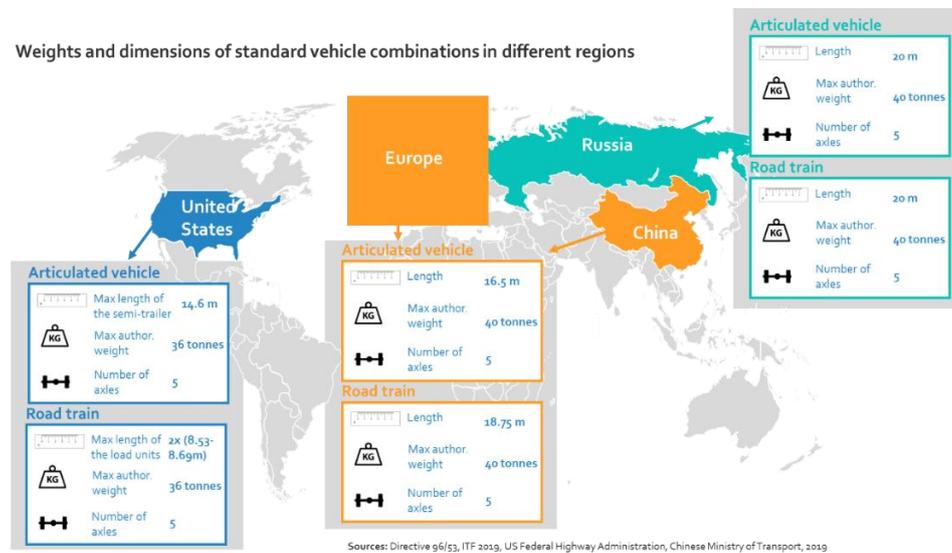
### IRU POSITION

- High capacity vehicle combinations are vehicles that are either longer than standard combinations, or longer and heavier. These vehicle combinations improve transport productivity and consume less fuel, thus produce less CO<sub>2</sub> emissions as they consolidate freight from smaller commercial vehicles. Given these economic and ecological advantages, they are Eco-Trucks.
- The use of Eco-Trucks is the fastest, simplest and most cost effective way to reduce CO<sub>2</sub> emissions in goods transport by road.
- Depending on the vehicle combination, Eco-Trucks reduce overall fuel consumption, and thus CO<sub>2</sub> emissions, by up to 35% (e.g. two Eco-Truck combinations replacing three standard trucks).
- Replacing 30% of the existing commercial vehicles worldwide with Eco-Trucks will lead to a reduction of 237 million tonnes of CO<sub>2</sub> annually.
- The use of Eco-Truck combinations help to fight congestion with one-third less trucks on the road.
- Eco-Trucks help to effectively tackle driver shortage in the road transport sector due to the reduction of vehicles in use.
- Eco-Trucks safety performance is in practice overall better than that of standard vehicle combinations.
- Eco-Trucks reduce road wear for the same payload carried due to a higher number of axles, thus reduced weight per axle and fewer vehicle kilometres travelled.
- Since heavier and longer trucks are used mainly for long-haul, governments need to coordinate and harmonise the cross-border use of Eco-Trucks.
- The rules for weights and dimensions should be harmonised and standardised on a regional context.
- The use of Eco-Trucks would make the transfer of swap bodies and containers from one transport mode to another much more efficient, sustainable and economically attractive.
- Governments should incentivise investments in and the use of the Eco-Trucks as well as initiate and, where already existing, scale up both national and cross-border operations and enforcement.
- Goods transport is expanding rapidly as a result of the rise in trade and the diversification of product value chains and is forecasted to triple by 2050. Eco-Trucks would offset the forecasted increase in demand and emissions.

## ANALYSIS

The road transport industry is committed to meet its responsibility in reducing its carbon footprint. IRU and its members have a clear vision for decarbonising commercial road transport up to 2050<sup>1</sup>. This vision is based on five pillars, one of which is the extensive use of Eco-Trucks which are the fastest, simplest and most effective way to significantly reduce CO<sub>2</sub> emissions in the road transport of goods and logistics sector.

The weights and dimensions rules for heavy goods vehicles are nationally regulated and can vary across countries and regions significantly, while very limited regional or global coordination exists between governments. In addition, the average maximum weight of trucks and the related legislation in key transport markets has not changed for the last 35 years. The most widely, nationally used vehicle combinations are tractor and semitrailer, tractor with centre axle trailer and trucks with drawbar trailers with an average tonnage of 36-40 tonnes (Map 1).



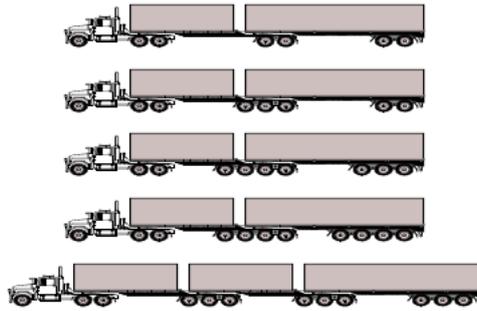
Map 1: Weights and dimensions of standard vehicle combinations in different regions.

Source: European Commission, International Transport Forum; US and Chinese Ministries of Transport, 2019.

Vehicle combinations with a higher capacity than a standard truck combination improve transport efficiency by increasing the load capacity of the vehicle, carrying more volume, weight or both. Fewer vehicle trips are required per goods transport operation, which reduces the number of vehicle kilometres driven on the road, lowers CO<sub>2</sub> emissions and cuts fuel use. Such vehicle combinations can either be longer than the standard combination, or longer and heavier.

Typical longer and/or heavier vehicle combinations, which have been trialled and used successfully under real life conditions can be as follows: A-double consists of tractor, semitrailer and full trailer. Full trailer has both front and rear running gear, but may also consist of a converter dolly and semitrailer. B-double consists of tractor, semitrailer with a fifth wheel and semitrailer. C-double consists of tractor, semitrailer, C-dolly and semitrailer. C-dolly is a converter dolly where the coupling of the drawbar has only pitch degree of freedom and the axle is steered. Examples from across the world are shown in the infographics below.

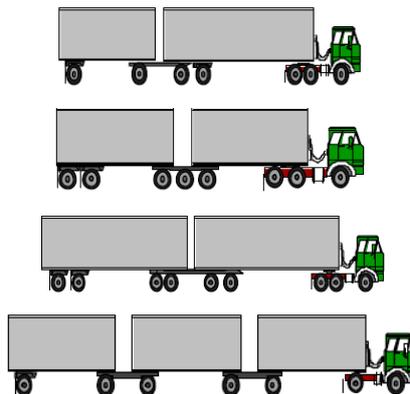
<sup>1</sup> IRU vision for decarbonisation up to 2050



Picture 1: Examples of Eco-Trucks used in Australia.  
 Source: Australian Trucking Association, "Description of truck configurations", 2016



Picture 2: Examples of Eco-Trucks used in Europe.  
 Source: TML, 2008



Picture 3: Examples of Eco-Trucks used in Canada, Mexico and the United States.  
 Source: "Comprehensive Truck Size and Weight Study, Volume 3", United States Federal Highway Administration.

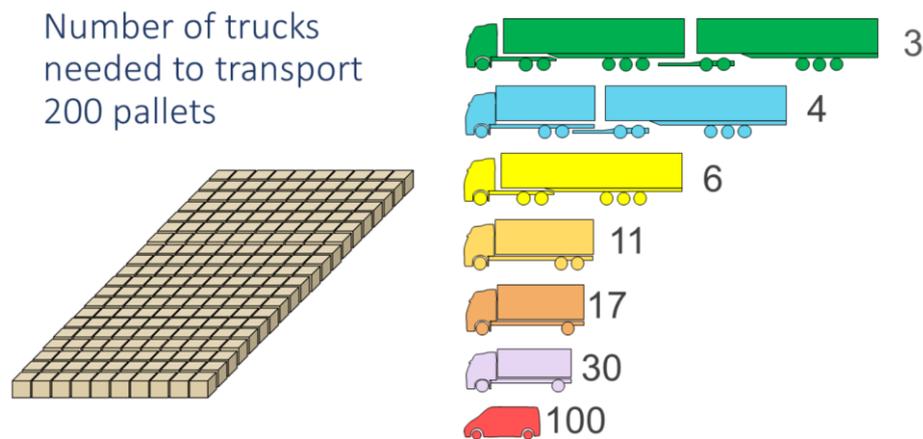
To illustrate the benefits associated with the use of Eco-Trucks, a transport volume of 200 pallets with 600 kilograms each would only require 3 tractor-semitrailer (C-dolly) combinations compared with six standard 40-tonne trucks or 100 light commercial vehicles (pictures 4). This could even be reduced to two C-dolly combinations when considering a maximum authorised weight per truck of 60 tonnes.

Accident statistics from Canada, Australia, Sweden, Denmark, the Netherlands and Germany show that the safety performance of such vehicle combinations is overall better than of standard vehicle combinations because they are in general more equipped with the latest Advanced Driver Assistance Systems (ADAS) which help the driver reduce human error, they are driven by more skilled and experienced drivers and their use reduces the number of truck journeys on the road.<sup>2</sup>

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<sup>2</sup> ITF, 2019

These vehicle combinations are not only safer and reduce the number of vehicles on the road, but also reduce road wear. Often, such vehicle combinations are used in cases where large volumes of either volume- or weight-limited cargo need to be transported on specific routes within a limited road network, and where the existing infrastructure requires no or minimal investment for allowing those vehicles on the roads<sup>3</sup>. In countries where they are in use or being trialled, the scope of the network where they are used often depends on their compatibility with existing road infrastructure including road surface, tunnel and bridge conditions in a given country or region. At the same time, further investments in road infrastructure is encourage to further benefit from Eco-Trucks. Feeder routes are important to ensure that industrial and logistical hubs are linked to a dedicated network.<sup>4</sup> Furthermore, it is also clear that there is a direct correlation between the CO<sub>2</sub> reduction potential and the size of the vehicle.



Picture 4: Number of commercial vehicles needed per load.  
Source: Cider, L. Larsson, L. Sweden, 2019.

Trucks Drivers	Total space on road	Fuel	Fuel Index	CO <sub>2</sub> / Pallet	Maximum authorized vehicle weight
No	meter	ml/tkm	40t base	kg	tonnes
3	294	14	72%	7	(76-90)
4	364	15	80%	8	60
6	492	19	100%	10	40
11	836	28	150%	14	26
17	1275	34	180%	17	18
30	2220	47	250%	25	12
100	7100	94	500%	48	3,5

Table 1: Advantages of HCVs.  
Source: Cider, L. Larsson, L. Sweden, 2019.

Depending on the vehicle combination and the transported load, several scientific studies<sup>5</sup> consider that Eco-Trucks lead to an overall reduction of fuel consumption,

<sup>3</sup> "ITS Applications for higher productivity of road freight transport", R. Aronietis and T Voegel, 2019

<sup>4</sup> ITF, 2019

<sup>5</sup> Including ITF, European Commission, ACEA, IEA, OPEC, IPCC.

and thus CO<sub>2</sub>, of 20% to 35% on average (due to the fact that two Eco-Trucks replace three standard trucks), but depending on the solution used the total CO<sub>2</sub> reduction potential is significantly higher.

Bearing in mind different regional specificities, information on transport volumes and vehicles, simulations done by the International Transport Forum (ITF) show that if only 0.3% of surface freight transport volumes were transported by Eco-Trucks, more than 6% of commercial road transport CO<sub>2</sub> emissions could be saved.

If 30% of the existing commercial vehicles worldwide were replaced by Eco-Trucks, nearly 237 million tonnes of CO<sub>2</sub> would be saved annually.<sup>6</sup>

Despite this very striking advantage, very few countries (Map 2), including Argentina, Australia, Canada, Czech Republic, Mexico, New Zealand, South Africa, the United States as well as nine European Countries (Belgium, Denmark, Finland, most German federal states, the Netherlands, Portugal, Spain, Sweden and Norway) have been piloting or trialling them on specific routes under specific provisions. However, none of these countries apply the same weights and dimensions rules. This hampers the cross-border use of Eco-Trucks. A lack of regional coordination between governments and the harmonisation and standardisation of rules for weights and dimensions remains the main bottleneck.

Countries demonstrating reduction of heavy vehicles journeys, fuel consumption, and CO<sub>2</sub> emissions while using high capacity vehicles



Map 2: Countries with HCV experience.

Source: ITF report on "High Capacity Transport, towards efficient, safe and sustainable road freight", Paris, 2019.

Eco-Trucks do not only offer a high degree of flexibility to meet various business requirements, but also have a particular advantage from an intermodal and combined transport point of view, helping to make intermodal transport more efficient, sustainable and economically attractive.

As an example, considering that a standard truck can carry two 20-foot containers or one 40- or 45-foot container, around 9,500 fully loaded vehicles would be needed to carry the cargo of a container vessel of 19,000 TEU (twenty-foot equivalent units) to and from the port to the hinterland. Deploying Eco-Trucks, capable of carrying three 20-foot containers or one 40-foot container and one 20-foot container, for such operations would reduce the number of truck trips by a third.

It should be noted that the capacity of container ships, and also planes and trains, has more than doubled in the last 15 years and this trend will most likely continue. The

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<sup>6</sup> Calculation based on: 17 million barrels of oil used by commercial vehicles every day (IEA, 2019), 330 million commercial vehicles circulating globally (OICA, 2018).

average maximum authorised weights and dimensions of trucks and related legislation is not keeping up with this economy of scale. Without any adjustment and increase of weights and dimensions for road transport, governments will be confronted with more congested ports, terminals, roads and hinterland infrastructures, which would lead to an unnecessary and dramatic increase in CO<sub>2</sub> emissions.

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