

DEKRA Automobil GmbH

ROAD SAFETY REPORT HGVS 2009

Strategies for preventing
accidents on Europe's roads



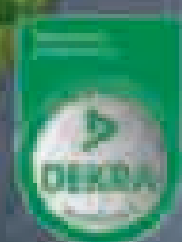
The incidence of accidents on Europe's roads: Heavy goods vehicles (HGV) are far safer than you think

Vehicle inspection: Increasing failure rate with increasing age

The human factor: High risk of accident through driver fatigue

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Strong commitment to safe freight transport

Since its formation in 1925 DEKRA has supported the transport industry in many ways. It has been concerned not only with vehicle safety but also with the people behind the wheel. Both these aspects are crucial for road safety in Europe. In addition to general inspections and expert opinions on commercial vehicles, for DEKRA, Europe's biggest organisation of independent experts, the crash tests performed regularly in the company's own Crash Test Center make an important contribution to road safety. Or the symposiums organised by DEKRA on active and passive commercial vehicle safety and load securing, the advanced training programmes offered by DEKRA Akademie especially for drivers and hauliers, or participation in EU road safety projects such as APROSYS and eSafety, to give just a few more examples.

The 2009 road safety report, which focuses mainly on heavy goods vehicles weighing more than twelve tonnes, is another example of our commitment to the commercial vehicle. This publication describes the development of vehicle failures and of accidents involving commercial vehicles and underscores further potential for improvement, including the need for greater market penetration of electronic driver assistance systems and, in this context, the creation of financial incentives for their purchase.

But the report is also a clear statement about heavy goods vehicles and freight transport. The flexibility of commercial vehicles far surpasses that of any other

form of transport and commercial vehicles are therefore undisputedly second to none in terms of performance. This will not change in the years to come – as demonstrated by a large number of studies and forecasts. Quite the contrary, the transport capacity of HGVs will continue to increase.

This means that the increased likelihood of individuals being involved in an accident is an inescapable fact. But it would be absolutely wrong to demonise HGVs as the number-one causer of accidents. In Germany heavy goods vehicles are only involved in a small proportion of accidents resulting in personal injury in relation to the total number of vehicles on the road. The situation is exactly the same in other countries.

But one thing is clear: where heavy goods vehicles are involved in accidents resulting in personal injury, the vast majority of such accidents continue to result in fatalities and extensive material damage. They often cause long tailbacks and traffic disruption as well, and this, in turn, results in negative reports in the daily press. Politicians, motor vehicle manufacturers and the transport industry are under pressure to combat the negative image of the commercial vehicle among the public at large. And it goes without saying that DEKRA is also actively involved in improving the roadworthiness and road safety of HGVs even further. This road safety report is a contribution to this effort.



Dr h.c. Klaus Schmidt, Chairman of the Boards of Management of DEKRA e. V. and DEKRA AG.

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Electronic driver assistance systems, load securing, tyres, rear-view mirrors, vehicle construction, risk management, rescue from an articulated truck involved in an accident: when it comes to reducing the number and minimising the effects of accidents involving HGVs even further there are still a lot of potential for improving vehicles.

48 The lesson is clear: the already high level of safety needs to be increased still further

In order to reduce the incidence of accidents, especially those involving HGVs, the necessary measures must be implemented as quickly as possible throughout Europe at all political and economic levels.

50 Any questions?

Contact person and bibliography for the DEKRA Road Traffic Report 2009.

IMPRINT

DEKRA Road Safety Report HGV 2009

Publisher:
DEKRA Automobil GmbH
Handwerkstraße 15
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June 2009

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Publication: ETMservices, ein
Geschäftsbereich der EuroTransportMedia
Verlags- und Veranstaltungs-GmbH
Handwerkstraße 15 · 70565 Stuttgart
www.etmservices.de
Business Divisional Manager:
Thomas Göttl
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Publishing Director: Bert Brandenburg
Project Manager: Thomas Ninow
Translation: Martina Wütz

Picture credits: K.-H. Augustin: page 34, P. 38, p. 41;
J. Bergrath: p. 35, S. 45; BGF: p. 26; J. Bilski: p. 24, p. 27,
p. 29, p. 42, p. 44, p. 45, p. 46; N. Böwing: p. 10, p. 11,
p. 12, 48; DEKRA: p. 1, p. 3, p. 5, p. 32, (T. Küppers);
p. 15, p. 18, p. 22, p. 23, p. 27, p. 30, p. 31, p. 37, p. 38,
p. 39, p. 40, p. 44, p. 52; F. Frieser: p. 36; Imago: p. 5
(W. Otto); T. Küppers: p. 7, p. 27, p. 28, p. 29, p. 31,
p. 35; W. Niewöhner: p. 38; M. Rathmann: p. 1, p. 6,
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Road safety concerns everyone

Following the tremendous success of last year's report on strategies for preventing accidents on Europe's roads DEKRA has devoted its 2009 road safety report to heavy goods vehicles weighing more than twelve tonnes. This focus was chosen quite consciously. Ultimately accidents involving trucks from this weight category and upwards often have extremely serious consequences for all those concerned – the truck driver on the one hand and, on the other, pedestrians and cyclists, who are especially vulnerable.

The fact is that, although in the past few years travel and transport on our roads has increased significantly and this trend is expected to continue undiminished, the frequency of accidents involving HGVs, especially in Germany, has fallen by more than seventy per cent since 1970. Between 1995 and 2007 alone the number of road users fatally injured or seriously injured in accidents involving goods road transport vehicles fell by approximately 40 per cent.

This positive trend is due in part to developments in vehicle safety among manufacturers and in part to road hauliers, who operate efficient risk management and regularly train their drivers and provide them with advanced training

programmes. Be that as it may, every person who dies as a result of a road traffic accident is one too many.

That there is still potential for improvement regarding the road safety of HGVs is clear in several respects. And this is shown in the DEKRA Road Safety Report 2009 by means of statistics and the evaluation of data from Germany and selected European countries.

An important aspect is the road-worthiness of the vehicle itself – with key features such as driver assisted systems, rear-view mirror systems, underrun protection or load securing, to name but a few, to the fore. But the conduct of the driver also has a great deal of influence on road safety. Drivers suffering from fatigue pose just as much of a risk as unbelted drivers. Because of their high workload older drivers are also at high risk of causing an accident.

But this report is far more than just a collection of facts about the current situation. Politicians, transport experts, manufacturers and the transport industry are under increasing pressure to improve the road safety of goods road transport vehicles weighing twelve tonnes and more. This report is intended to give them food for thought and advice.



Dipl.-Ing. Clemens Klinke, Head of the Business Unit DEKRA Automotive and Chairman of the Board of Management at DEKRA Automobil GmbH.



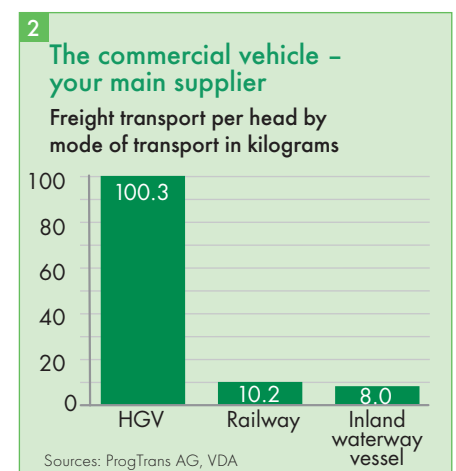
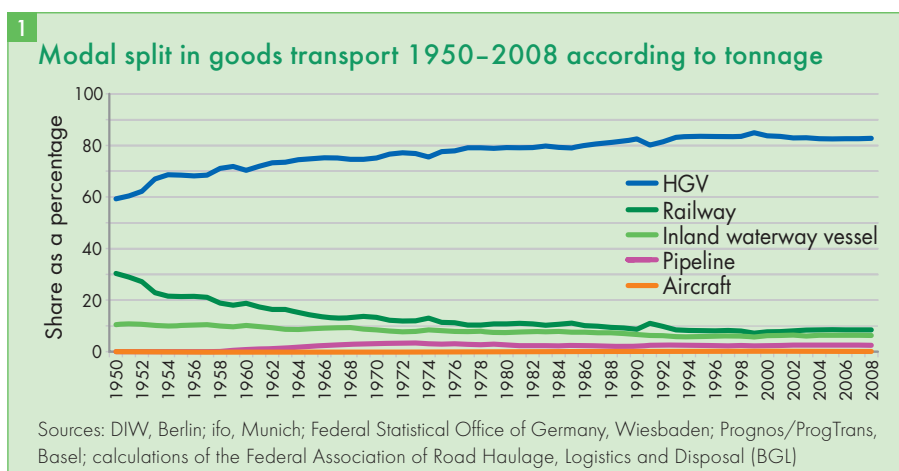
High benefit value for society

The statistics speak for themselves: in the coming years the volume of goods traffic on Europe's roads will increase significantly. The road-worthiness of commercial vehicles is therefore becoming more important than ever. It is central to preventing accidents and saving lives, increasing the flow of traffic and cutting costs.

It stinks, makes a din, pollutes the atmosphere and causes traffic jams. This negative image still besets the HGV even today. Just one example is enough to show this: in a recent survey carried out by the consultants PricewaterhouseCoopers in

various European countries 83 per cent of those polled said that the HGV was the most polluting means of transport. Manufacturers have improved their trucks with considerable technological effort in order to meet strict requirements. In the

last few years in particular a great deal has been done to significantly reduce fuel consumption, CO₂ emissions and pollutant emissions (Chart 3). The particle emissions of newly registered commercial vehicles with a Euro 5 engine are now

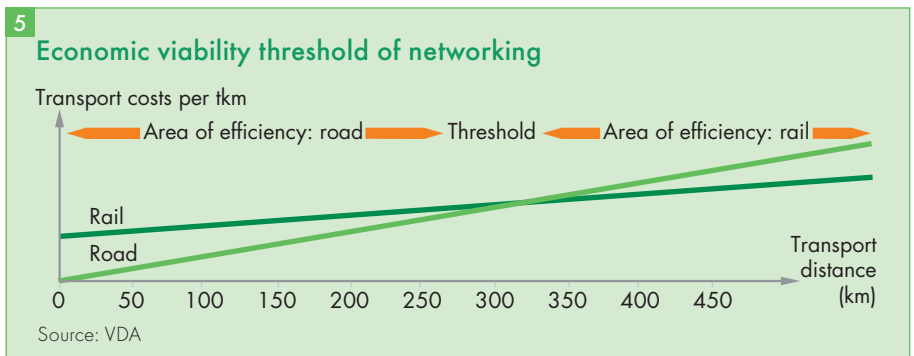
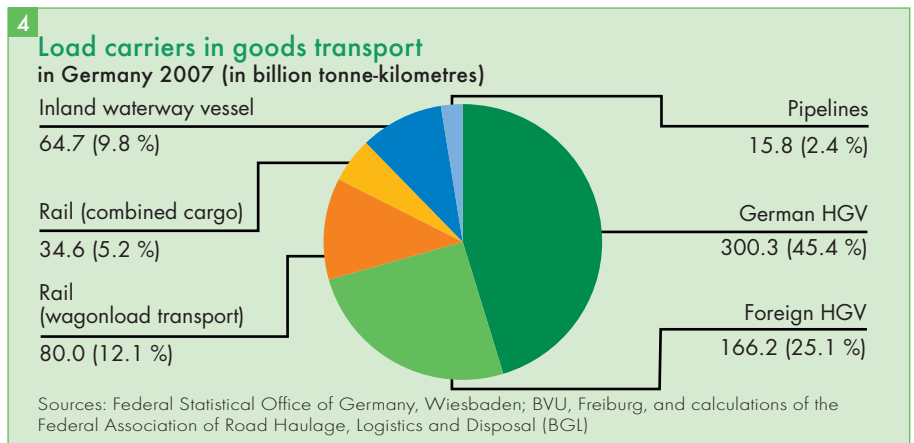
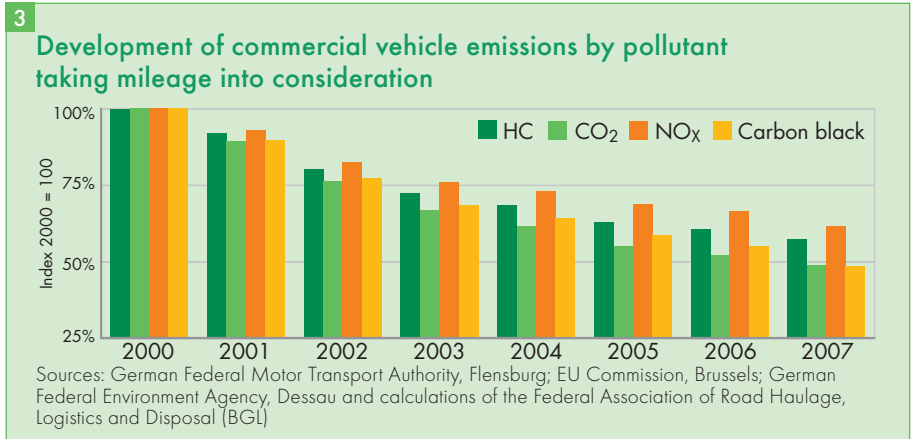


almost 95 per cent lower than in 1990. The NO_x emissions fell by 86 per cent in the same period.

It is also too easily forgotten that commercial vehicles are crucial to our wellbeing and shoulder more than 70 per cent of the entire volume of goods traffic both in Germany and in Europe. Taking the volume of goods traffic on the roads as a benchmark, the figure rises to more than 80 per cent. Every day, for every citizen, HGVs transport 100 kilograms of goods, either as end products to homes and supermarkets or as raw materials and semi-finished products for their manufacture. With this volume of goods, commercial vehicles carry ten times the volume of goods transported by rail or barge (Charts 1, 2 and 4).

NO OTHER MEANS OF TRANSPORT IS AS FLEXIBLE AS THE HGV

The strength of the commercial vehicle is in part its virtually unrivalled flexibility. In contrast to a train or a ship, which has to rely on tracks or waterways, an HGV can go right up to the loading ramp of the retail outlet or to the door of the recipient of a delivery. This advantage makes the commercial vehicle indispensable, especially in regional transport. According to the Verband der Automobilindustrie (German Association of the Automotive Industry (VDA)) logistics experts estimate that the economic viability threshold for rail transport is a total distance of around 300 kilometres (place of dispatch to place of delivery) (Chart 5). For shorter distances it is hardly worthwhile to use the train – transportation is almost exclusively by road. Here, the commercial vehicle is an all-round service provider – as a rescue vehicle, street-cleaner and postal van, to give just a few examples.



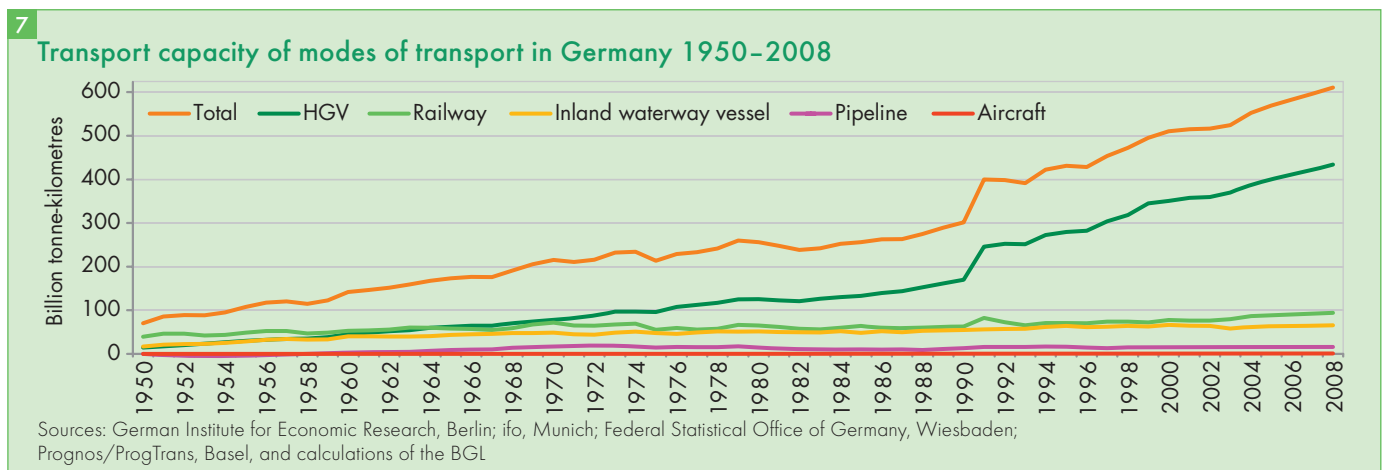
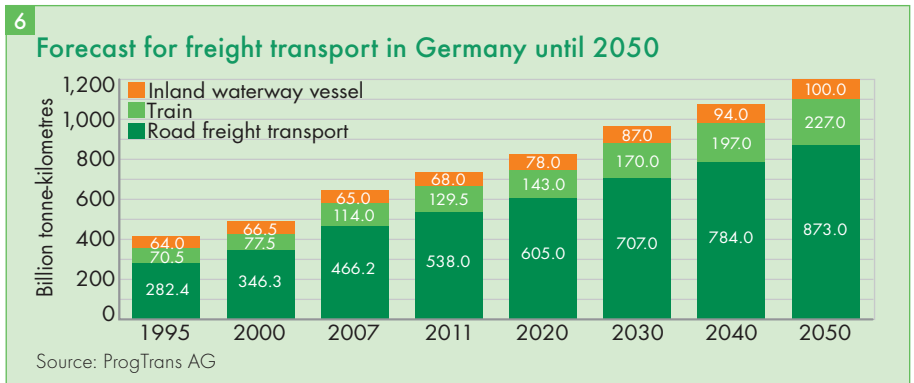
For the transport of goods the HGV is far and away No. 1.



Even in urban traffic the truck takes on a prominent role.

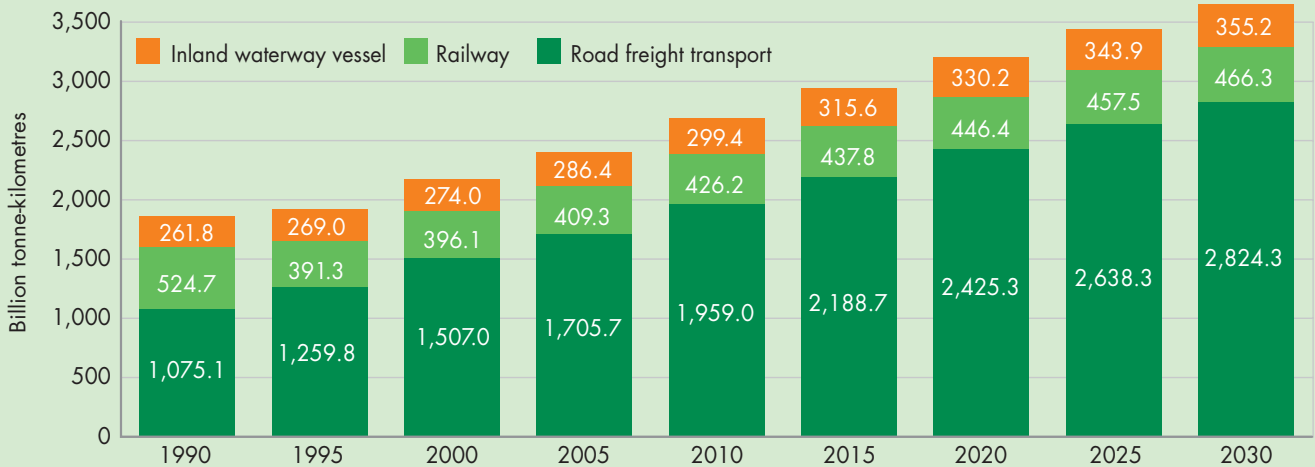
THE HGV - AN IMPORTANT ECONOMIC DRIVER

The commercial vehicle is also an important job creator. In Germany, for example, approximately 210,000 people are employed in the commercial vehicle manufacturing sector, which is around 20 per cent of all those employed in the automotive industry. In addition, many jobs depend indirectly on the operation, servicing or use of commercial vehicles – approximately 2.5 million nationwide.



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Freight transport in the EU 27 until 2030

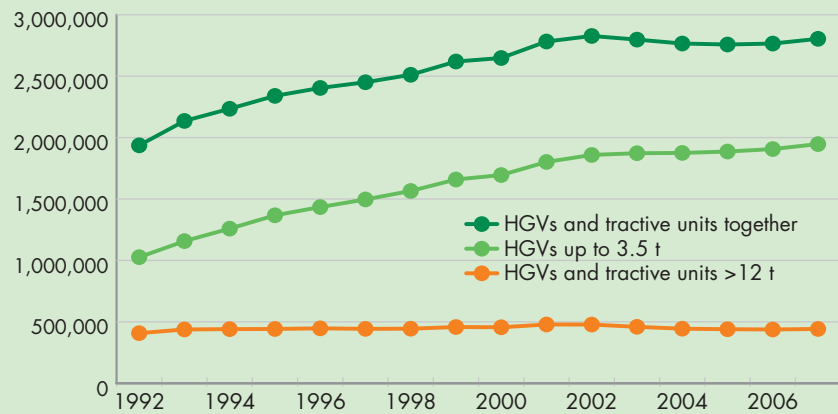


Source: EU-Kommission

According to the Federal Government, the transport and logistics sector generates around 7.2 per cent of GDP, most of which is accounted for by the HGV sector. In addition, commercial vehicles also make a significant contribution to financing the state budget through petroleum taxes, motor vehicle taxes and the "Lkw Maut", a toll for goods vehicles based on the distance driven in kilometres, the number of axles and the emission category of the vehicle. For the segment of HGVs with a maximum permissible weight exceeding 7.5 tonnes alone tax receipts are in the region of 3.35 billion euros per annum. Added to this is a further 3.5 billion euros each year from toll income. The freight trans-

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HGV stock in Germany



Source: German Federal Motor Transport Authority, Flensburg, calculations of the BGL

port business pays a total of 12.5 billion euros in taxes every year in Germany.

The importance of the commercial vehicle for our society is also strikingly reflected in the increasing transport capacity of German and foreign HGVs, including articulated trucks, in Germany – rising from 252 to 467 billion tonne-kilometres between 1992 and 2007 (Chart 7). And it won't stop there, as this trend is set to continue unabated in the years to come. In January 2008 the German Federal Ministry of Transport published a forecast according to which transport capacity will grow by 88 per cent between 2007 and 2050 (Chart 6).

MAJOR PROGRESS MADE IN ROAD SAFETY

There are many challenges ahead for HGVs in terms of road safety. With





High volume of trucks quickly leads to tailbacks on uphill stretches.

the rise in the transport capacity of commercial vehicles there is a greater likelihood that people will be involved in accidents and that the incidence of accidents will rise. Although the number of people involved in accidents is relatively low, given the large number, greater transport capacity and longer presence of HGVs on the roads a driver has a more than six times greater risk of being involved in an accident than other road users.

But the fact of the matter is that, thanks to enormous progress made by manufacturers in developing driver assistance systems for instance, the number of accidents involving trucks in Germany relative to the number of vehicle-kilometres has fallen by over 70 per cent since 1970. Relative to mileage today trucks are just as safe as passenger cars. For each million kilometres travelled trucks are involved in 0.44 accidents resulting in personal injuries. With the same mileage, passenger cars are involved in 0.46 accidents resulting in personal injuries. From 1992 to 2007 the number of road users seriously injured in accidents involving trucks fell by 4,869 (-36.5 per cent) from 13,345 to 8,476. In the same period the number of fatalities fell by 738 (-40.3 per cent) from 1,833 to 1,095 (Chart 11).

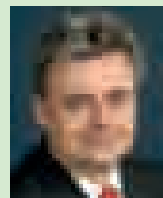
MAKING EVEN MORE EFFICIENT USE OF SAFETY ASPECTS

Be that as it may, every death or injury resulting from a traffic accident is one too many. It is therefore important to make even more efficient use of the active and passive safety aspects of commercial vehicles. Accidents not only mean human suffering, they also place an enormous financial burden on those affected, the economy and society. A study carried out in 2007 by INFRAS, a Swiss private and independent consulting group providing policy analysis and implementation services to private and public organisations, and the Institut für Wirtschaftspolitik und Wirtschaftsforschung (IWW) at the University of Karlsruhe entitled “External Costs of Transport in Germany” (Chart 10) put the cost of road traffic accidents for 2005 at 41.7 billion euros. Of this, personal transport accounted for 38.8 billion euros and freight transport accounted for “just” 2.9 billion euros. According to the study, congestion costs totalled 75.6 billion euros. Personal transport gave rise to costs of 44.1 billion euros and freight transport gave rise to costs



Ulrich Kasparick, Parliamentary State Secretary at the Federal Ministry of Transport, Building and Urban Affairs

“The number of people dying on our roads in 2008 fell to a historic low. With modern vehicle technologies we will increase safety further still. The Federal Ministry of Transport is involved in the development of this system as part of the European eSafety Initiative. We support modern, electronic vehicle technologies through aids granted under the “De Minimis Support Programme”. In addition, Germany will put esafety at the centre of its proposals for the next European Road Safety Programme from 2010.”



of 31.5 billion euros. There is therefore a need for action in this regard.

However, back to road safety. Safety on Europe's roads is always an interaction of various factors involving both passenger vehicles and commercial vehicles. For major improvements to be made in this area in the future, the condition and the safety equipment of a vehicle are just as important as the behaviour of the driver. In the following sections, the report shows where there is a need to catch up and what measures and countermeasures need to be taken to increase the road safety performance of trucks in particular.

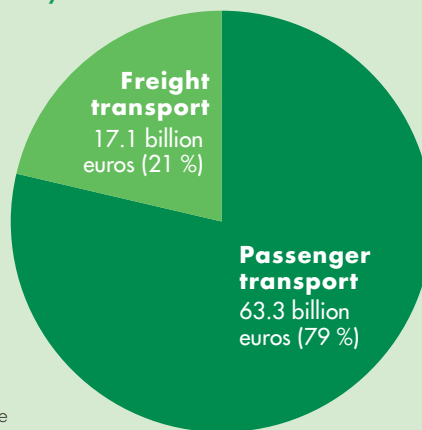
The focus will be on goods road transport vehicles weighing 12 tonnes



Following an accident involving an HGV heavy equipment is often necessary to recover both vehicle and load.

10 External costs* of transport in Germany

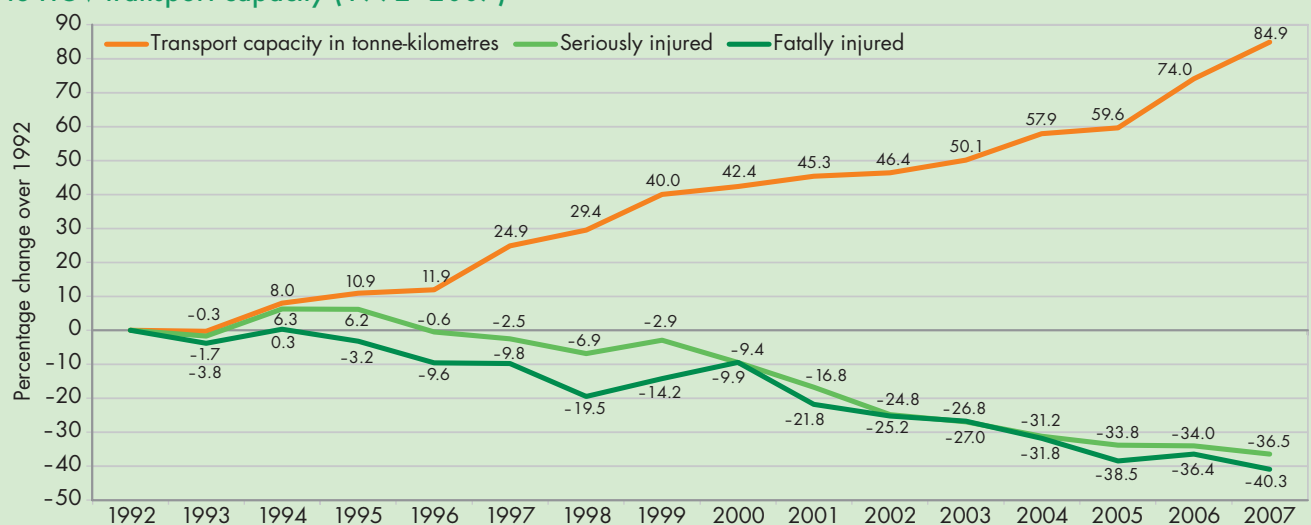
In Germany in 2005 external transport costs amounted to 80.4 billion euros. Passenger transport costs of around 63.3 billion euros accounted for 79 per cent and cargo transport costs of 17.1 billion euros accounted for 21 per cent. At 15.8 million euros the share of road freight transport was 93 per cent.



*Accidents, noise, air pollution, climate costs, nature and landscape consumption, additional costs of urban areas, etc.
Source: Infras 2007, dating 2005

and above. And not without good reason, as accidents involving trucks of this weight class and above often have very serious consequences for all those concerned because of the heavy weights involved. References to goods road transport vehicles and heavy goods vehicles (HGVs) or trucks in this report are therefore mainly references to heavy goods vehicles having a maximum permissible weight exceeding 12 tonnes.

11 Number of people fatally injured and seriously injured in accidents involving HGVs in Germany in comparison to HGV transport capacity (1992-2007)



Source: Federal Statistical Office of Germany, Wiesbaden; DIW, Berlin; ifo, Munich; Prognos/ProgTrans, Basel; BVU, Freiburg, and calculations of the Federal Association of Road Haulage, Logistics and Disposal (BGL)



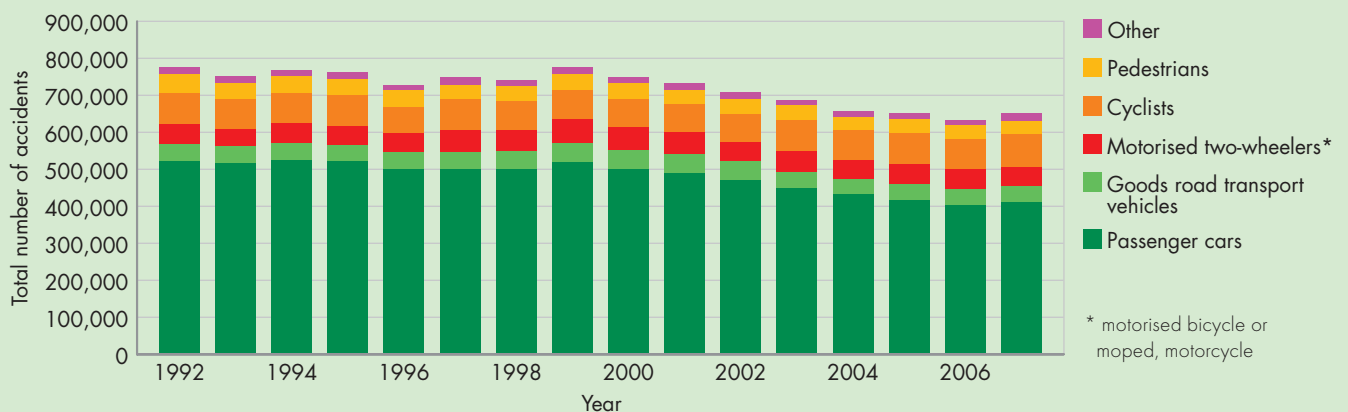
Far safer than you think

Media reports may give quite a different impression but goods road transport vehicles have only a relatively small share in the entire incidence of accidents. The vast majority of these accidents involve two vehicles and the passenger car is most often the other party involved. With regard to vehicle failures, the most common "serious failures" occur in the brake system.

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Incidence of accidents involving goods road transport vehicles in Germany

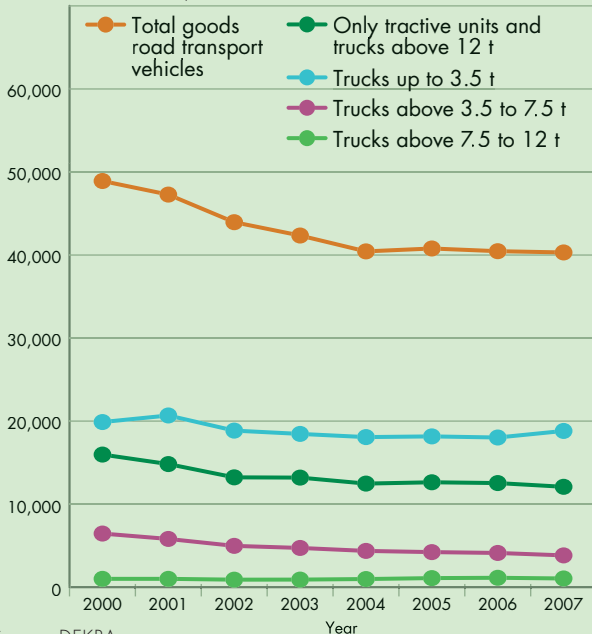
Because of their share of the number of vehicles on the roads and of the number of kilometres driven goods road transport vehicles only have a small share in the number of vehicles involved in accidents causing personal injury in Germany.



Source: Federal Statistical Office of Germany

13 Goods road transport vehicles involved in accidents causing personal injury

The total number of goods road transport vehicles involved in accidents causing personal injury in Germany fell continuously from 2000 to 2007 from 48,916 to 40,312 (-17.5 per cent). This means that this development has decoupled from the number of goods road transport vehicles as a share of the number of vehicles on the roads as, between 2000 and 2007, the number of goods road transport vehicles on the roads rose from 2,647,660 to 2,803,819 (+5.9 per cent).



Source: DEKRA

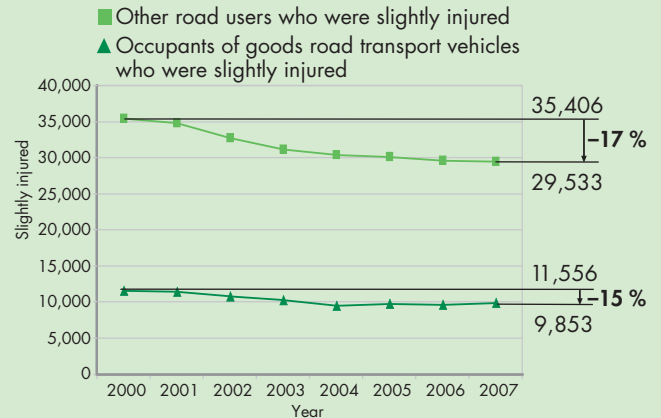
The figures speak for themselves: in Germany in 2007 there were 335,845 accidents causing personal injury, i.e. fatally injured or seriously injured road users. At least one goods road motor vehicle was involved in 36,217 of these accidents – representing a share of 10.8 per cent. However, when goods road transport vehicles are involved in accidents causing personal injury, the vast majority of these accidents result in road users being fatally injured. The reason for this is the greater weight and lower compatibility of goods road transport vehicles in comparison to other road users. Added to this is that fact that large, heavy goods road transport vehicles pose an additional risk in that, for example, cyclists and pedestrians get right in front of the wheels of the vehicle and are run over (Charts 12 to 16).

MILEAGE-RELATED RISK OF ACCIDENTS INVOLVING HGVS

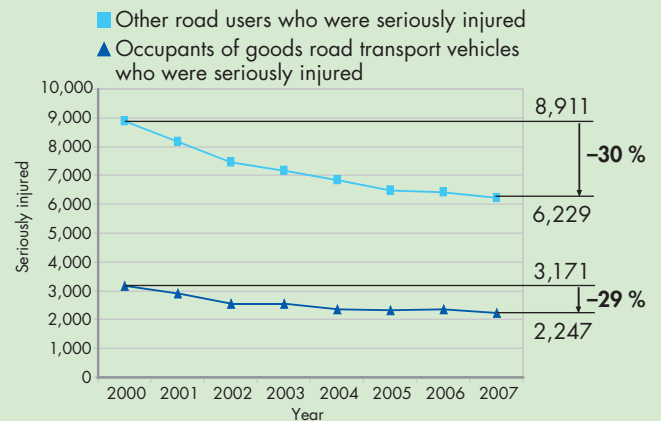
It is generally known that, in previous years, safety on Europe's roads has improved significantly (see DEKRA

14 Injured and fatally injured road users in accidents involving goods road transport vehicles in Germany

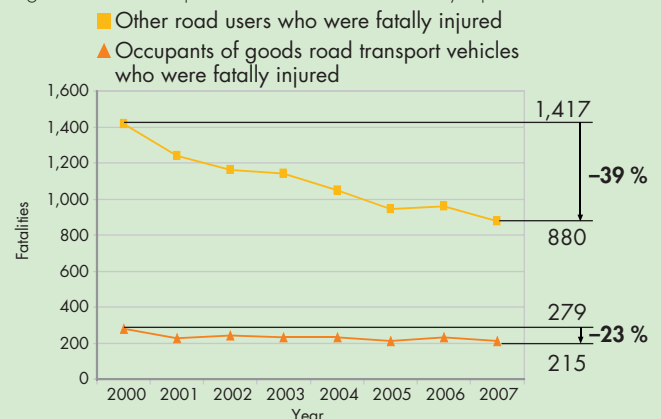
From 2000 to 2007 the number of occupants of goods road transport vehicles who were slightly injured and the number of other road users who were slightly injured in accidents involving goods road transport vehicles in Germany showed similar relative changes.



15 From 2000 to 2007 the number of other road users who were seriously injured in accidents involving goods road transport vehicles in Germany fell much further than the number of occupants of goods road transport vehicles who were seriously injured.



16 From 2000 to 2007 the number of other road users who were fatally injured in accidents involving goods road transport vehicles in Germany fell much further than the number of occupants of goods road transport vehicles who were fatally injured.

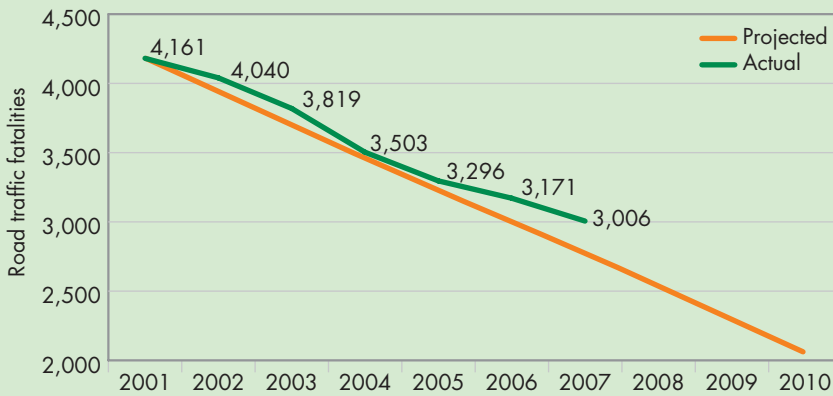


Source: Federal Statistical Office of Germany

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Road traffic fatalities (EU 10) involving trucks > 3.5 t

For 10 countries (France, Germany, United Kingdom, Netherlands, Portugal, Spain, Greece, Austria, Belgium and Finland) figures for road traffic fatalities in accidents involving trucks (> 3.5 t) are available in chronological order. The trend is analogous to the trend in all road traffic fatalities.



Source: Federal Statistical Office of Germany

Road Safety Report 2008). This is also the case with accidents involving goods road transport vehicles. As the figures presented above show, although the occupants of goods road transport vehicles have also been able to participate in this positive development, it has benefited

the other road users involved even more, especially in the case of accidents in which road users were fatally injured or seriously injured. The technical equipment, including electronic stabilisation systems, airbags and other safety elements, have clearly been more effective

in passenger cars than in goods road transport vehicles.

Of the 36,217 HGV accidents causing personal injury in 2007 in Germany 2,599 were single-vehicle accidents, i.e. accidents in which no other vehicle or pedestrian was involved. In 21 per cent of all HGV accidents causing personal injury at least three road users were involved, and in 72 per cent just one more road user was involved. In the latter case, passenger vehicles were by far the most frequent other party involved (Chart 19).

In order to determine and make a comparative assessment of the risk of involvement in accidents, the number of accidents involving a specific group of vehicles can be compared to the number of registered vehicles in this group. This approach is a common practice. Comparison figures are published by the Federal Statistical Office of Germany, among others, in their annual reports. In 2007, for example, for all goods road transport vehicles, there were 11.7 accidents causing personal injury per 1,000 registered vehicles.

At 34.6 and 37.3 for HGVs weighing more than 12 tonnes and tractive units respectively in 2007 these characteristic values appear at first sight to be relatively high. One reason for this is the increased risk of injury to the other road user in

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Road traffic fatalities in accidents involving trucks > 3.5 t in selected European countries

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Austria	150	145	177	143	122	143	140	144	126	120
Belgium	195	228	193	204	193	178	136	143	161	133
Czech Republic	-	-	-	-	-	-	-	-	-	215
Denmark	93	88	86	97	78	80	69	65	79	49
Estonia	-	-	-	-	-	-	-	-	50	37
Finland	112	88	121	77	118	105	97	107	91	82
France	1.113	1.164	1.090	1.051	1.057	988	758	727	726	683
Germany	-	-	-	1.195	930	838	901	779	738	769
Greece	242	277	268	205	220	219	217	181	158	167
Hungary	-	-	-	-	-	-	115	264	251	239
Ireland	85	63	61	67	70	42	54	-	-	-
Italy	476	421	562	582	411	359	358	336	-	-
Netherlands	177	140	175	168	169	129	158	-	-	-
Portugal	356	219	296	284	197	214	213	187	163	130
Spain	888	959	905	920	803	860	834	766	714	664
Sweden	97	117	93	119	118	135	92	59	1	83
United Kingdom	554	605	641	581	607	561	548	478	510	443

Source: SafetyNet Statistical Annual Report 2008, Federal Statistical Office of Germany



The regular main inspection of commercial vehicles also contributes to increased road safety.

accidents involving goods road transport vehicles. However, the mileage of the individual vehicle groups is of primary importance. Although vehicles parked at the edge of the carriageway can be involved in road traffic accidents, the risk of involvement in a road traffic accident rises with increased mileage.

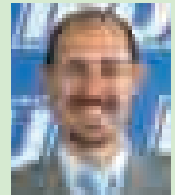
In 2007, for 1 billion kilometres travelled, 703 passenger cars, 518 light commercial vehicles and trucks (all weight categories) and 442 heavy articulated trucks were involved in accidents causing personal injury. In 2007, therefore, the mileage-related risk of a passenger car being involved in accidents causing personal injury was one and a half times greater than that of a goods road motor vehicle (Chart 20).

CAUSES OF ACCIDENTS INVOLVING GOODS ROAD TRANSPORT VEHICLES

Accidents generally have more than one cause. When collecting statistical data for their accident reports, police officers order the causes of an accident on the basis of a standard list according to their assessment at the scene of the accident. On the one hand there are general causes (road conditions, weather conditions, obstacles, etc.), which are attributed to the accident and not to the individual road users involved; on the other hand there is the incorrect behaviour of the individual (red light violation, etc.), which is attributed to the vehicles drivers or pedestrians involved in the accident. Depending on the accident,



Jens Hügel, Head of Sustainable Development at International Road Transport Union (IRU)



"To reduce accidents involving trucks efficiently, an internationally harmonised approach to accident research is required. The IRU-EU "ETAC Study", in which DEKRA was involved in a leading role, was a trend-setting approach. Safety on Europe's roads can also be increased through international cooperation between government agencies and through harmonised roadside vehicle controls."

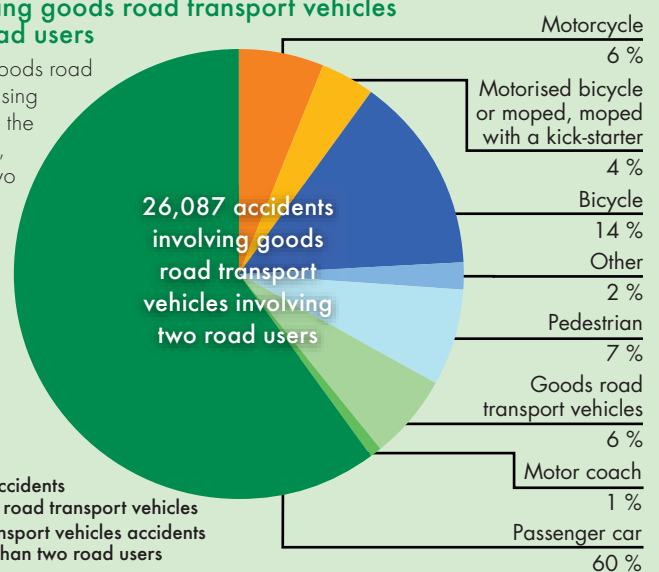
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Accidents involving goods road transport vehicles involving two road users

Accidents involving goods road transport vehicles causing personal injury are, in the vast majority of cases, accidents involving two road users. The other road user most frequently involved in accidents involving goods road transport vehicles is the passenger car (the figures for 2007 are shown here).

Also:
2,599 Single vehicle accidents involving goods road transport vehicles
7,531 Goods road transport vehicles accidents involving more than two road users

Source: Federal Statistical Office of Germany



the police can give up to two general causes and up to three causes each for the main perpetrator and another road user involved. In total, therefore, for a single accident the police can enter up to eight causes in the federal statistics form. According to this survey methodology, in 2007 a general cause was established for 12 per cent of all 335,854 accidents causing personal injury.

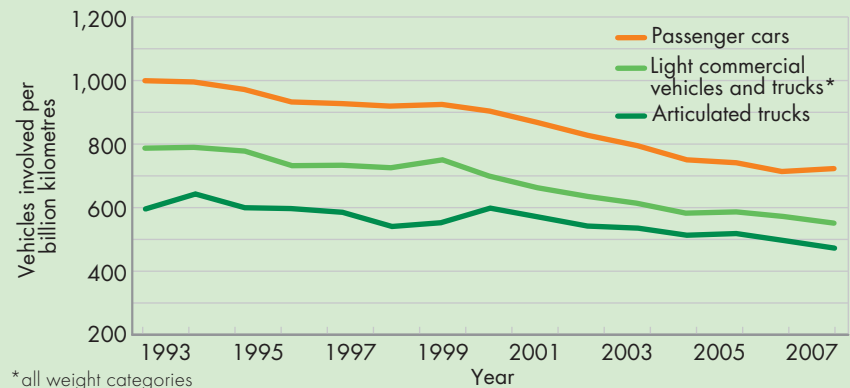
In 2007, in all accidents causing personal injury, the police established technical failures in 0.7 per cent of the vehicles involved (4,436 cases). The most common were lighting failures (1,024 cases), tyre failures (1,213 cases), braking failures (774 cases) and steering failures (168 cases).

The relative frequency of the technical vehicle failures noted, which official statistics designate as the cause of accidents, is relatively low. On the other hand, according to official statistics, technical vehicle failures and maintenance failures cause accidents resulting in personal injury in a similar order of magnitude as

20

Development of involvements in accidents

In relation to the number of miles travelled, trucks and tractive units are involved in far fewer accidents causing personal injury than passenger cars.



*all weight categories

Sources: Federal Statistical Office of Germany, German Institute for Economic Research

snow and ice. In addition, with regard to the failures identified by the police to be the cause of accidents, there is likely to be a large number of undetected cases, to which the official statistics also make spe-

cific reference, attributable in large part to the fact that it is difficult for the police officers reporting the accident to identify technical vehicle failures.

The most common cause of accidents by far is the human factor. In 2007, in 409,529 cases, the police established that the driver was at fault in 335,854 cases of accidents causing personal injury. The drivers of passenger cars were to blame for most of this inappropriate behaviour (281,086 established cases), which corresponds to their high level of road use and involvement in accidents. The inappropriate behaviour of truck drivers was established in 28,474 cases of accidents causing personal injury, which corresponds to just under 7 per cent.

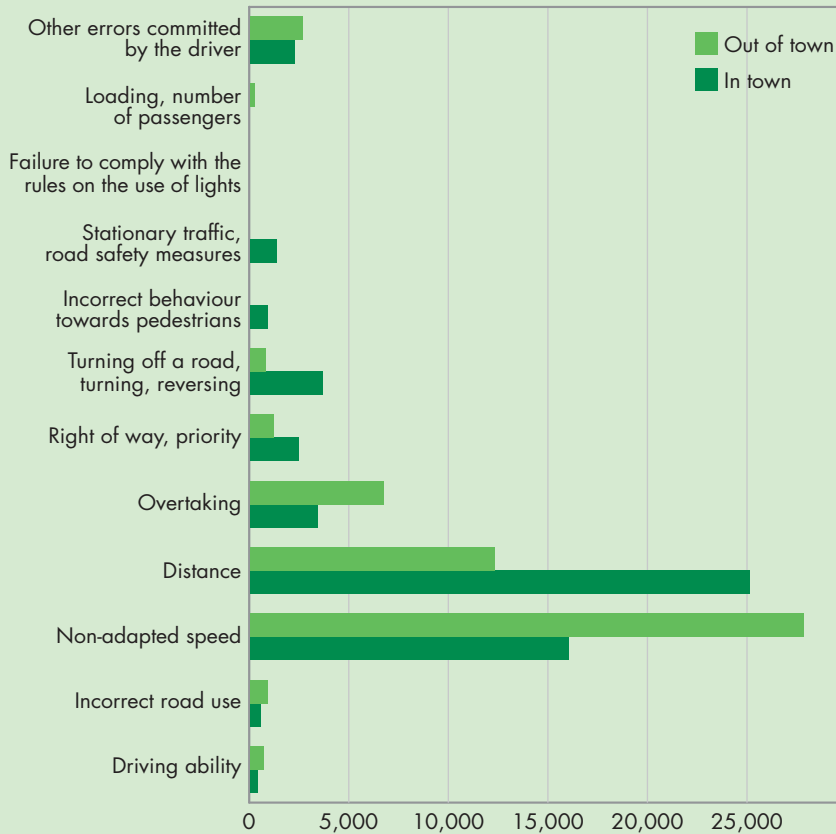
However, if one relates the established inappropriate behaviour to every 1,000 persons of the corresponding group of road users, the ranking clearly changes in favour of drivers of goods road transport vehicles. While, in 2007, out of 1,000 drivers of passenger cars involved in accidents causing personal injury, 681 drivers were guilty of inappropriate behaviour, out of 1,000 drivers of goods road transport vehicles involved in accidents causing personal injury, 711 were guilty of inappropriate behaviour. Among the latter, the most common form of inappropriate behaviour in the case of inner-city accidents was not keeping enough distance and, in the case of accidents outside built-up areas, driving at speeds that are not in line with weather conditions and the flow of the surrounding traffic (Charts 21 to 23).

In total, 59 per cent of all drivers of goods road transport vehicles (all weight categories) involved in accidents in 2007 in Germany were the main cause of an accident causing personal injuries.

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Error on the part of goods road transport vehicle drivers

Not enough distance and non-adapted speed were the most frequent errors on the part of goods road transport vehicle drivers in accidents giving rise to personal injury in Germany in 2007.

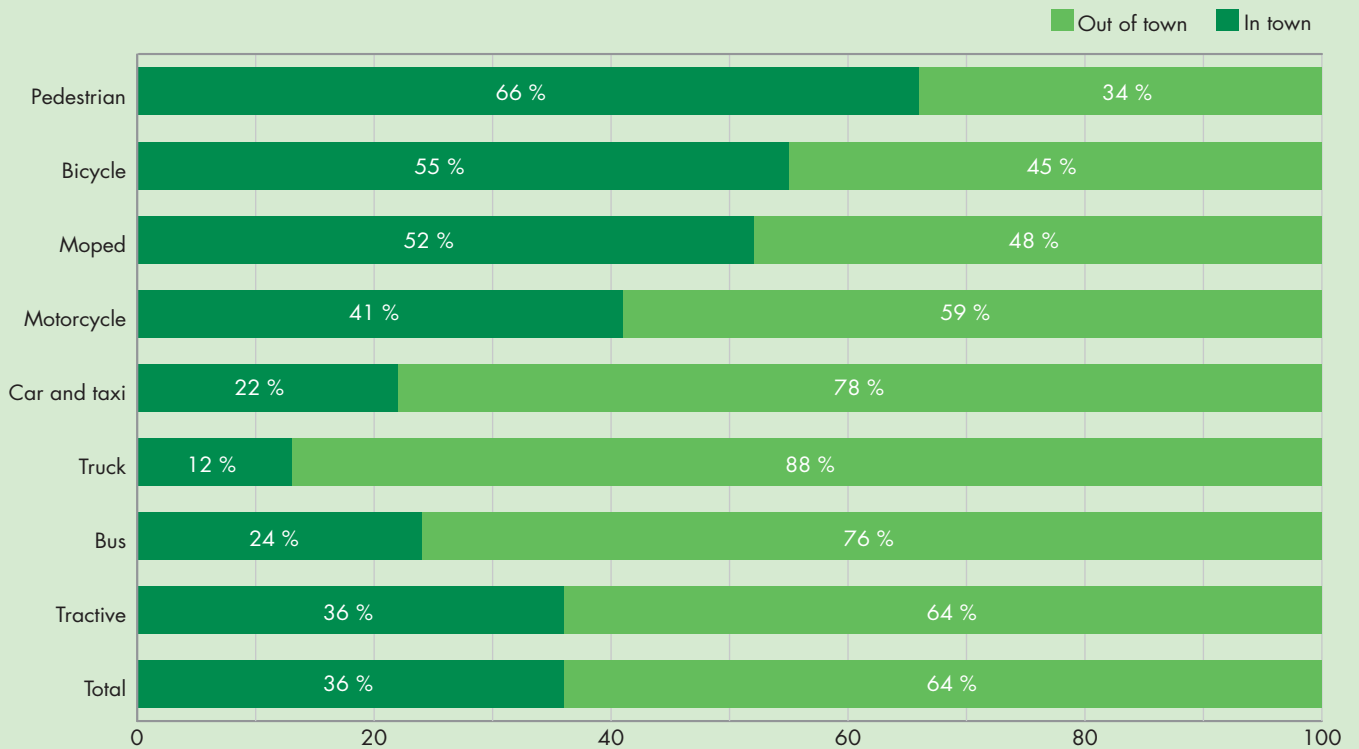


Source: Federal Statistical Office of Germany

22

Share of fatalities by site 2006 (EU 19)

The out-of-town share of fatally injured occupants of goods road transport vehicles is 88 per cent and is much higher than among other road users. The interior protection for occupants should therefore be designed for typical out-of-town situations.



Source: SafetyNet Statistical Annual Report 2008

Whereas, in the case of drivers of small light commercial vehicles and trucks in the weight category from 2.0 to 3.5 tonnes, 62 per cent of drivers were the main culprits, in the case of drivers of heavy goods vehicles weighing 16 tonnes and above and tractive units, the proportion was 52 per cent and 53 per cent respectively, and, at 50 per cent, was

much lower in the case of tanker trucks (Chart 24).

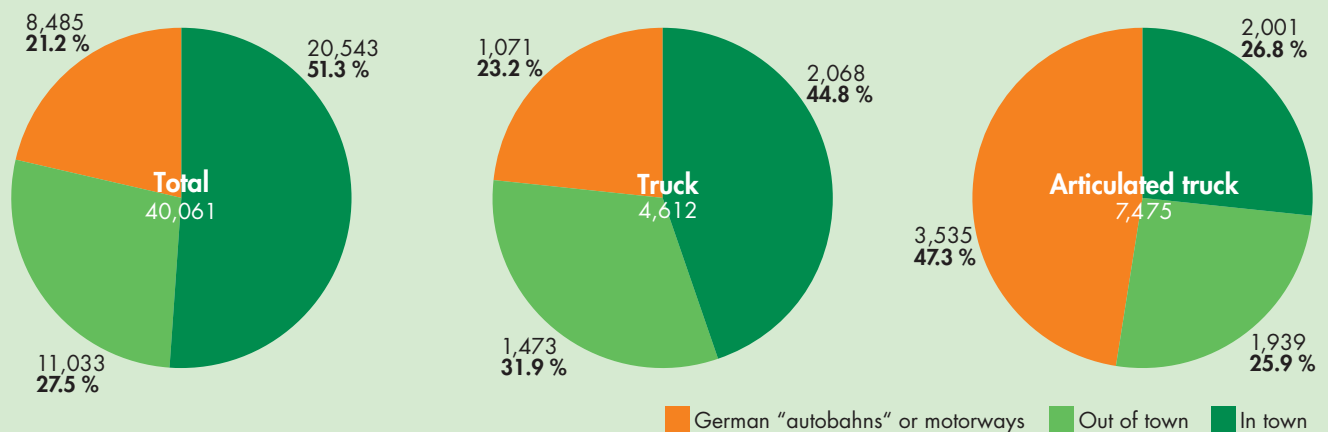
EUROPEAN INVESTIGATIONS INTO THE CAUSES OF ACCIDENTS

Very few uniform statistics are available on HGV accidents in Europe. However, in the context of eSafety (Working Group

Commercial Vehicles), a number of organisations have attempted to identify accident situations a large proportion of which concern Europe (Chart 25). Lane departure, collision with a truck travelling in front, head-on collision with an oncoming passenger car, side collision with a passenger car and collision with a pedestrian or cyclist account for between

23

Goods road transport vehicles involved in accidents giving rise to personal injury in 2007 in Germany by site



Source: Federal Statistical Office of Germany

40 and 62 per cent of all accidents in which people are fatally injured or seriously injured.

Interesting conclusions regarding the basic causes of accidents involving HGVs in the EU are drawn in the ETAC Study (ETAC = European Truck Accident Causation) of the International Road Transport Union (IRU) published in 2007, according to which 27 per cent of accidents are accidents at road junctions, 20.6 per cent are accidents in queues, 19.5 are accidents due to lane departure, and 11.3 per cent are accidents after an overtaking manoeuvre. In the case of accidents at road junctions, the main causes are failure to observe road junction rules and non-adapted speed. The main causes of accidents in a queue are non-adapted speed and insufficient safety distance. The main causes of accidents due to lane departure are non-adapted speed and fatigue / falling asleep, while the main causes of accidents after an overtaking



Technical vehicle failures also increasingly lead to accidents.

24

Accident types: HGV and articulated trucks in 2007 in Germany

The share of the parties responsible for accidents involving trucks weighing in excess of 12tonnes resulting in personal injury is virtually identical, but the allocation of such accidents to the different accident types paints a very different picture. Trucks weighing in excess of 12tonnes are listed more frequently as the main party responsible for accidents if another vehicle is travelling in front or is stationary, while tractive units are listed more frequently as the main party responsible for accidents with oncoming vehicles. A consideration of accident types shows a higher share for articulated trucks of the main parties responsible for driving accidents (= loss of control of the vehicle).

Accident type	Accident causing personal injury					
	Drivers involved		Main party responsible for the accident		Share of main parties responsible for the accident/parties involved	
	Trucks > 12 t	Tractive units	Trucks > 12 t	Tractive units	Trucks > 12 t	Tractive units
Starting, stopping or standing in stationary traffic	324	448	151	211	46.6 %	47.1 %
Vehicles in front or waiting	1,129	2,318	620	1,001	54.9 %	43.2 %
Travelling in parallel in the same direction	604	1,276	377	760	62.4 %	59.6 %
Approaching	745	758	189	235	25.4 %	31.0 %
Turning off /crossing	941	997	524	571	55.7 %	57.3 %
Collision with pedestrian	117	132	74	82	63.2 %	62.1 %
Collision with an obstacle on the carriageway	30	63	24	41	80.0 %	65.1 %
Deviating to the right	240	574	176	441	73.3 %	76.8 %
Deviating to the left	136	388	50	250	36.8 %	64.4 %
Other type of accident	346	521	220	340	63.6 %	65.3 %
Total	4,612	7,475	2,405	3,932	52.1 %	52.6 %

Source: Federal Statistical Office of Germany

manoeuvre are inattention and fatigue / falling asleep.

PAN-EUROPEAN UNIFORM ACCIDENT DATABASE NECESSARY

The falling number of accidents causing personal injury involving heavy goods vehicles is, among other things, an indication of the effectiveness of special training programmes for truck drivers. For this positive trend, which has been developing for many years, to be maintained, work relating to road safety must continue undiminished. Investigations into how and why accidents happen are an important component in the construction of safe roads and vehicles for the prevention of accidents. There are many relevant accident statistics at a national and an international level, but what is missing is a uniform European database, which makes the comparison and analysis of the figures of individual companies difficult.

The fact is that, on balance, Germany has excellent official statistical sources, which are accessible to the public and which can be used for detailed large number accident research. In particular, these data lend themselves to an analysis of the accident situation with regard to its current main elements and associated historical developments. Due to the different definitions of vehicles and of the characteristics of an accident situation it is still not possible to extend national studies to international areas of investigation.

Against this background DEKRA is calling for the introduction and management of a harmonised European accident database, in which the trucks involved can be clearly distinguished from other vehicles and classified according to their total permissible weight. It should at least contain the three groups up to 3.5 tonnes, above 3.5 to 12 tonnes and above 12 tonnes. It would also be preferable to subdivide the group above 3.5 to 12 tonnes into the subgroups above 3.5 to 7.5 tonnes and above 7.5 to 12 tonnes. The individual characteristics and their instances should also be further harmonised and standardised to describe the accident situation in Pan-European accident statistics when the data are collected in the individual Member States of the European Union.

SAFELY ON THE MOVE WITH SAFE TRUCKS

Various international studies, such as the ETAC study mentioned above, show that technical vehicle failures are responsible for more than 5 per cent of accidents involving goods road transport vehicles. Here too there are unreported cases, as it is usually very difficult or impossible to detect vehicle failures during the studies. However, the low rate is doubtless also a result of the existing system of vehicle monitoring with main inspections carried out by organisations of experts such as DEKRA and other service providers. As in the case of passenger cars, the main inspections of heavy goods vehicles registered in Germany over 12 tonnes show that, with increasing age, the rate of failures increases. With vehicles up to three years old, the proportion of vehicles with failures is 33.5 per cent, whereas the proportion of vehicles over nine years old with failures is 71.4 per cent (Chart 26). Electrics and lighting are the assemblies with the highest rate of failures. The reason for this is the large number of lighting devices in these vehicles, which ultimately lead to a large number of failures in this area (Chart 27). Essentially, the rate of failures over all assemblies increases with increasing age.

CLASSIFICATION OF FAILURES AND THE MOST FREQUENT SERIOUS FAILURES

Almost 75 per cent of failures in brake systems are classified as “serious failures” or the brake systems are classified as “not roadworthy”. The chassis / steering assembly accounts for approximately 42 per cent of failures, while the electric /

electronic / lighting assembly accounts for approximately 8 per cent. In the latter case, as already mentioned, the lighting assemblies that do not work exhibited the majority of failures. As one would expect, therefore, the most frequent “serious failures” are in the brake systems.

Typical failures are:

- Inadequate braking action of the service braking device or the parking brake
- Uneven braking action of the service braking device or the parking brake
- Torn brake linings
- Leakiness of the braking device

Other typical failures are:

- Failures of the steering tie rods and push rods
- Defective or worn-out tyres
- Failures of connecting devices (e.g. coupling bolts)
- Stabilisers and their storage
- Oiled motors and gearboxes
- Defective setting of full beams and low beam headlamps
- External rear-view mirrors do not meet the (new) requirements

Other typical failures of these vehicles are:

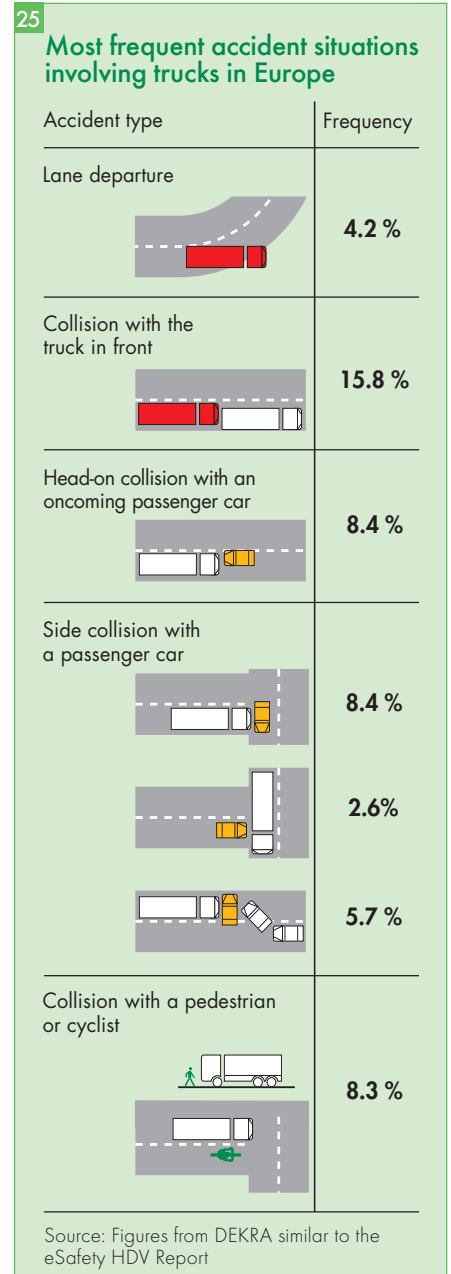
- Failures of the exhaust system
- Damage to the shell and its securing
- Damage to the bodywork
- Defective lighting systems

COMPARISON GERMANY - FRANCE - CZECH REPUBLIC

If one examines the main inspection results for “serious failures” (in Germany: “serious failures” or “not roadworthy”) a similar picture emerges for the three countries Germany, France and the Czech Republic (Chart 28).

The figures for Germany and France show a similar trend at a similar level. The figures for the Czech Republic are lower and follow the trend only to a limited extent. In one case (8 to 9 years) the failure rates do not increase with increasing age. The different figures are essentially due to different inspection requirements and documentation.

If one groups together (all) failures for the most important assemblies a uniform picture emerges for the three countries: common to all three countries is the fact that failures in the three named assemblies play an important role (Chart 29). In Germany, for example, failures in the chassis / steering assembly and bodywork / frame / interior are more frequent than brake failures. However, in the latter case,

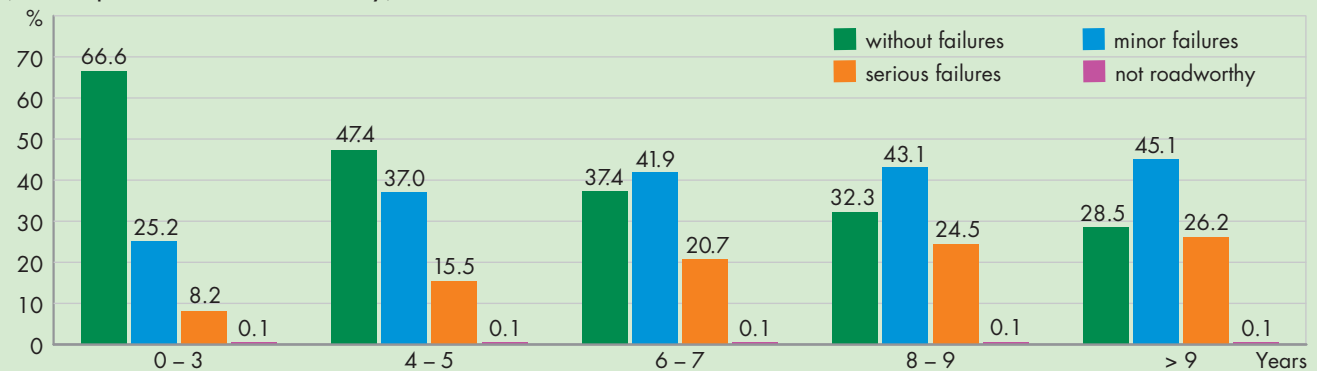


failures are classified as “serious failures” or the assemblies are classified as “not roadworthy”, and therefore the incidence of brake failures is more conspicuous than the proportion of this failure would have us believe.

In the Czech Republic, the proportion of the most serious category of failures (“not roadworthy”) is much higher than in Germany. Also, most brake failures are classified as “not roadworthy” in the Czech Republic. If one examines the lists of the most frequent “serious failures” from Germany and the Czech Republic, there are hardly any differences. The figures for France are rather more difficult to interpret, as many of the listed failures are categorised as “minor failures”.

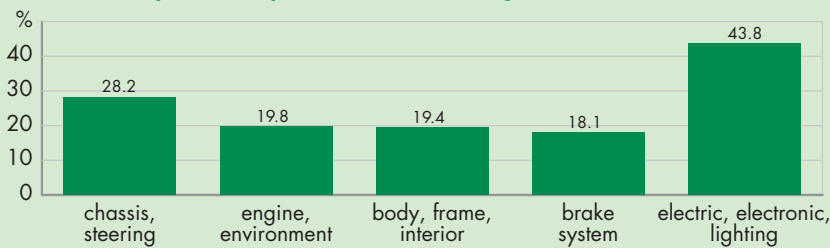
26 Failure rates of heavy goods vehicles exceeding 12 tonnes (Main inspection results from Germany)

(Main inspection results from Germany)



Basis: HGVs having a maximum permissible weight exceeding 12 tonnes, data from two years (2007 and 2008). Around 320,000 main inspections carried out by DEKRA were evaluated.

27 Failure rates by assembly (over all vehicle age classes)



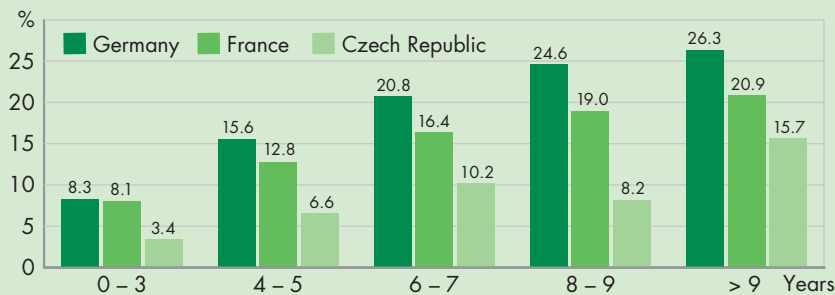
Source: DEKRA

In addition to the findings of the DEKRA Testing Division, the analyses carried out by DEKRA appraisers of trucks involved in accidents also reach interesting conclusions concerning failures of heavy goods vehicles. In terms of technical condition, there are clear differences between new and old trucks. Over all age classes, in the last few years failures have been identified in 29 per cent of trucks inspected after being involved in an accident (Chart 30). Appraisers established failures in 15.3 per cent of trucks up to three years old. Among trucks aged between three and five years, the rate of 30.2 per cent was slightly above average. Failures were identified in 46.2 per cent of vehicles aged between seven and nine years involved in an accident. In vehicles above nine years old, the rate was 59.1 per cent. As regards failure categories, brakes, tyres and steering / vehicle connecting parts come out on top (Chart 31).

EFFICIENT ORGANISATION OF VEHICLE TESTING

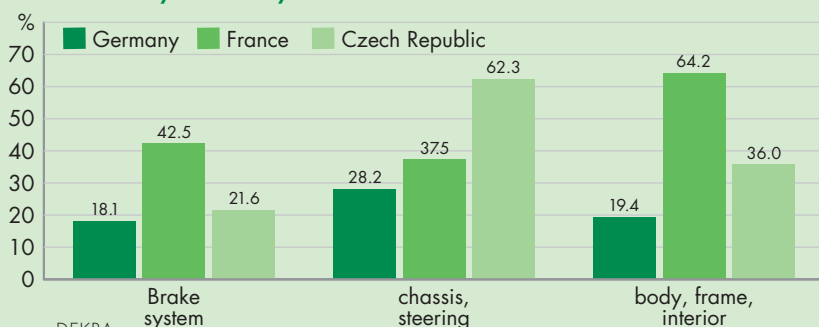
DEKRA has tested commercial vehicles since it was established more than 80 years ago. As today, at that time it was important that the test was carried out not only competently and appropriately but also efficiently. From the outset the place and time of the test were very flexible, and were arranged to fit in with the needs of the owner. This meant that it was possible for the owner to integrate the test optimally into internal processes. At the same time it was and still is guaranteed at all times that the test is carried out by independent highly qualified experts. This recipe for success still applies today, even though the technology has in the meantime made consid-

28 Main inspection results for "serious failures" (in Germany: "serious failures" or "not roadworthy")



Sources: DEKRA Germany, France, Czech Republic

29 Failure rates by assembly



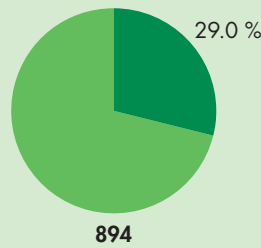
Source: DEKRA

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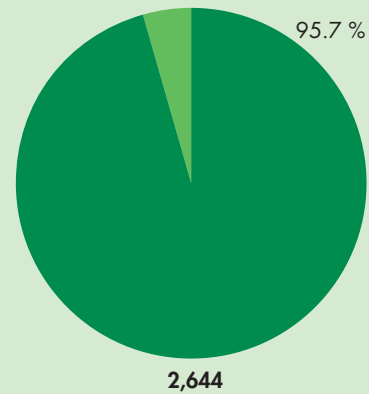
Failure statistics by accident and road traffic control

Trucks exceeding 3.5 tonnes (trucks and articulated trucks) inspected by DEKRA appraisers and found to be defective between 2002 and 2008.

Inspected by road accident
of which with failures



Inspected by road traffic control
of which with failures



with failures
without failures

Source: DEKRA

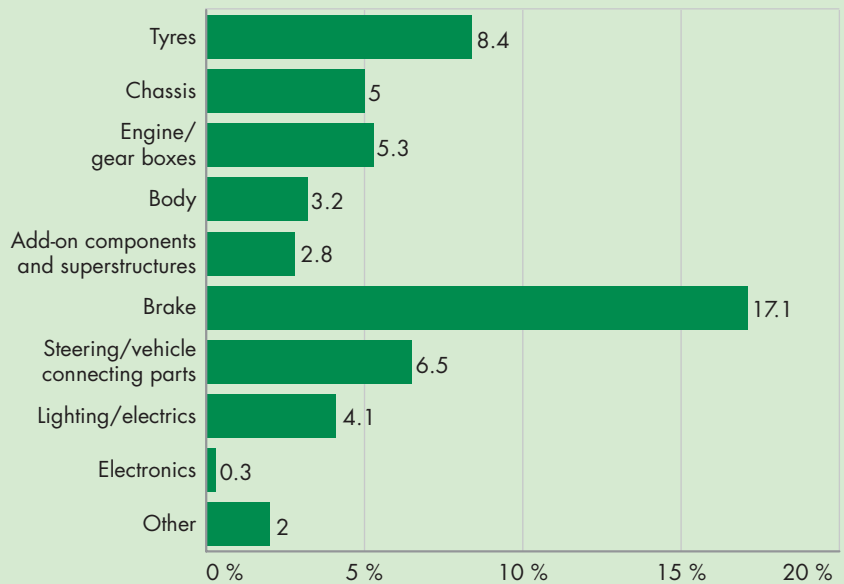
erable progress. Modern data processing and data transfer techniques made their entry at DEKRA a long time ago, enabling vehicle-specific information to be provided directly at the test site and the measurements taken by the testing techniques to be recorded directly.

It is true to say that the need to take action in terms of EU-wide harmonisation of the main inspection will become more acute in the future.

Although Directive 96/96/EC (Council Directive 96/96/EC of 20 December 1996 on the approximation of the laws of the Member States relating to road-worthiness tests for transport vehicles and their trailers) applies to all EU Member States, because of its framework character it has led to different vehicle monitoring systems in the individual countries. Details of the contents of the test were worked out to meet national requirements for the performance of the test and for the documentation of the results. As a result, objectively comparable statistics are not available.

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Failures in assemblies by accident



In the case of vehicles with failures several areas can be affected. 100% = all trucks inspected.
Source: DEKRA

The inspection of the brake system of heavy goods vehicles

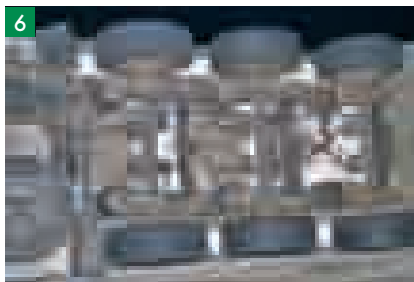
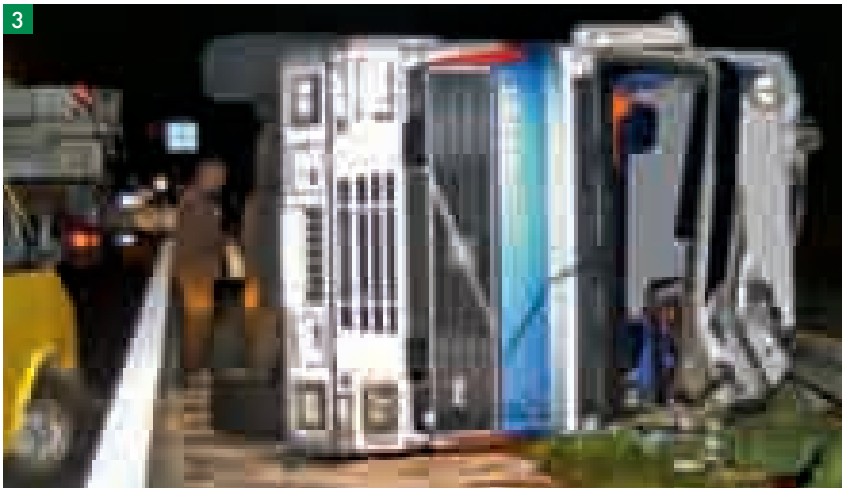
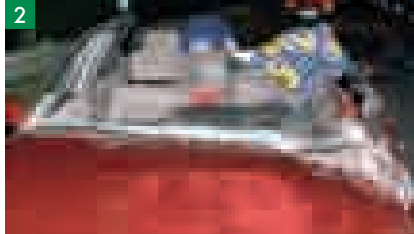
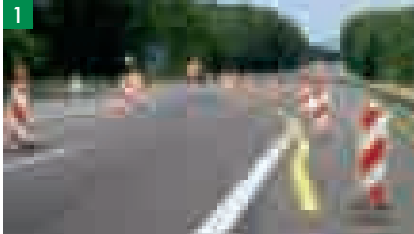
A truck's brake system can be considered the most safety-critical assembly. Because of the heavy weight of the vehicle it is exposed to enormous loads when in operation. Without the appropriate construction, service and maintenance there are huge risks for all road users. Assessing the safe condition of the brake system, i.e. assessing whether the brake system is able to slow down the fully laden vehicle reliably and safely, is therefore one of the most important test components of the main inspection. The simplest way of achieving this is by subjecting the fully laden

vehicle to a test not only to assess whether all basic components and parts are safe but also to directly measure and assess the required braking forces by means of a test bench. In practice, however, it is virtually impossible to present the vehicle for testing fully laden. Nevertheless, in order to express a reliable opinion on the condition of the brake system, a two-stage procedure is followed. Under this procedure a positive assessment of all relevant parts and components is a prerequisite for the second part of the test, during which the brake forces are

assessed in conjunction with the brake pressures on a brake test bed. Then, after the measured values are extrapolated to the design pressure of the brake system, whether the brake system can brake the fully laden vehicle is assessed. In the future, as well as this procedure, the reference value method, under which the vehicle manufacturer will give the target values for brake forces and brake pressures, will gain in importance. Several vehicle manufacturers have already started to provide these values for assessing the brake system.

Two striking accident examples in detail

Failures in the chassis and the brake system are by far the most common causes of accidents with, in some cases, fatal outcomes. The following two examples from the accident analyses carried out by DEKRA show this all too clearly. In both cases, the accident could have been avoided.



1 View in the direction of travel in the area of the construction site
2 Car involved in the accident
3 End position of the articulated truck front

4 End position of the trailer rear
5 Defective shock absorber on the attached trailer
6 Axles of the articulated truck

Example 1

CHASSIS FAILURE IN COMMERCIAL VEHICLES

On a Federal autobahn, an articulated truck became unstable in a highway system that had been altered in the area of a construction site. The unstable condition was caused by a braking manoeuvre. As the accident unfolded, the articulated truck tipped over to the left side of the vehicle and moved into the lane of the oncoming traffic, colliding with an oncoming passenger car. In the collision, the left half of the roof of the passenger car was forced downwards, fatally injuring the driver.

Cause of the accident / Failure identification

The DEKRA experts found that the articulated truck was equipped with an airsprung chassis. An inspection of the chassis uncovered some illegal welded joints. Serious failures were detected in shock absorbers as well as in the axle guides.

The DEKRA experts took the view that the cause of the accident was the defective condition of the chassis of the articulated truck.

Summary assessment

The DEKRA experts were of the opinion that the cause of the accident had two essential components: first, the comparatively high approach speed in conjunction with a braking procedure that was initiated too late; second, the seriously defective articulated truck. In this case, the fact that the load had not been secured properly contributed to the tipping process.

The DEKRA experts were of the opinion that a truck driver with an intact vehicle and a properly secured load would have been able to follow the course of the road and hence prevent the accident.

Vehicle driven by the driver who caused the accident

Vehicle type: Tractive unit
Truck: Volvo, Type: FH12-420
Trailer: Pactron, Type: 3142PL4
Age of vehicle: Truck: 10 years, trailer: 12 years

Example 2
BRAKE FAILURES IN COMMERCIAL VEHICLES

At the end of a long, partially winding downhill gradient a fully laden articulated truck was unable to stop at a stop sign at the road junction with a dual carriageway. The articulated truck involved in the accident was laden with road basalt and had a maximum permissible weight exceeding 40 tonnes.

The articulated truck crossed the dual carriageway, crashed through the crash barrier on the other side of the road and went down an embankment, where the right side of the driver's cab of the towing vehicle hit a tree. The driver was seriously injured.

Cause of the accident / Failure identification

The DEKRA experts found that the sliding, fully laden trailer of the articulated, which weighed 41.34 tonnes, jack-knifed. Because of the sliding weight the frame of the truck buckled on several occasions. The fifth wheel coupling tore away and the trailer tipped over. The traction unit was brought to a halt by the tree with the driver's cab severely indented. There were no locking or brake tracks where the vehicle had left the lane.

An inspection of the brake system of the traction unit showed that the front and rear brakes were worn away on the inside right down to the rivets and that the play of the brakes was excessive. The rear brake linings were burnt through.

The brake drums on the second and third left axis of the trailer had been torn off. The brake on the first axle was soft and completely burnt through. In the second axle on the right the ABS sensor was lubricated and the linings were worn out. The legally prescribed brake values could not be achieved on the brake test stand.

Summary assessment

Because of these failures, when the articulated reached the bottom of the downhill gradient the brake system was ineffective and the articulated was unable to stop properly at the stop sign.

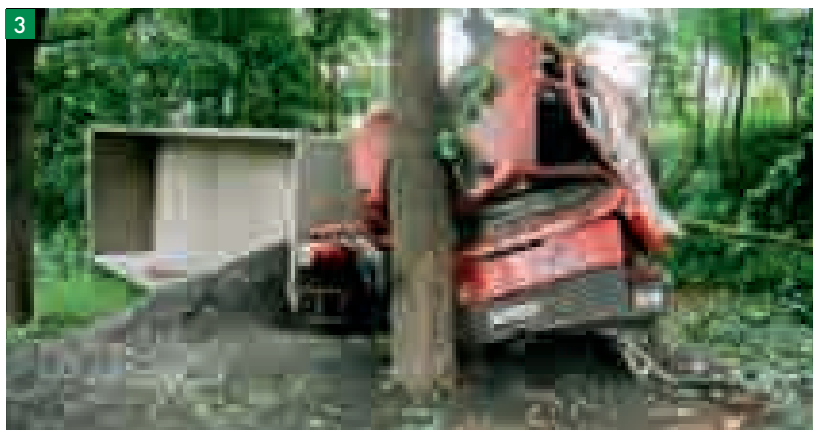
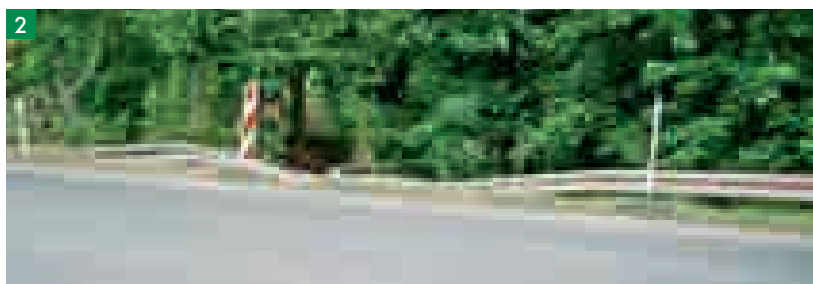
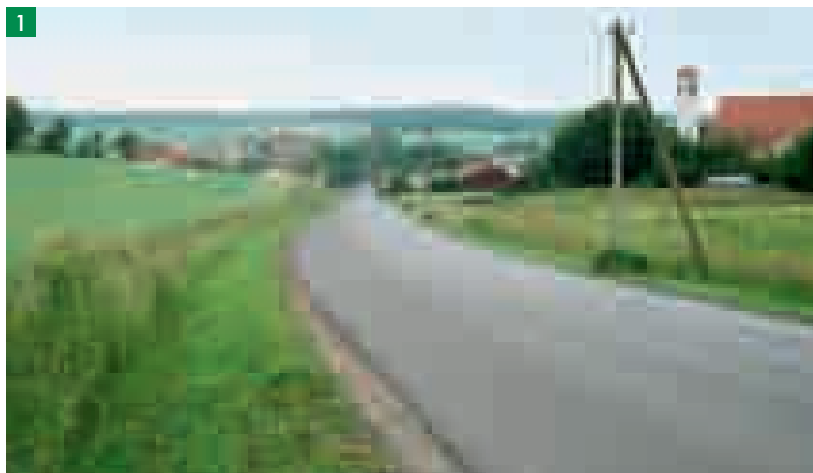
The DEKRA experts were of the opinion that the driver could have recognised the wear state of the brake. Through regular maintenance the technical state of the vehicle could have been maintained at the level prescribed.

The heavy transversal wear of the brake linings of the articulated and the destruction of both brake drums on the trailer were caused by assembly faults.

Vehicle driven by the driver who caused the accident

Vehicle type: Articulated truck and trailer
 Truck: IVECO-Fiat, Type:190-36 PT
 Trailer: Kumlin SKM 34

Age of vehicle: Lkw: 13 years, trailer: 13 years



1 Course of the road before the site entrance
 2 Pierced crash barrier before the embankment
 3 End position of the articulated truck
 4 Damaged membrane of the adjuster
 5 Left and right axles – very different wear states of the brake linings
 6 Decayed brake lining caused by overheating

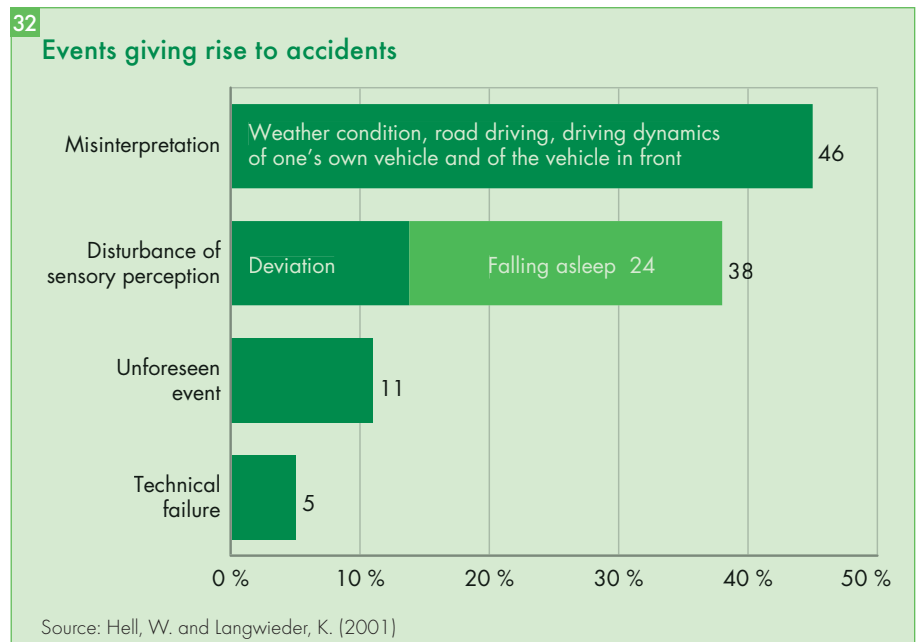




Human error can be avoided

When it comes to analysing the causes of road traffic accidents involving heavy goods vehicles technical failures and external conditions are just two of many factors to take into consideration. The person behind the steering wheel plays a very important role. Fatigued drivers are a major risk. Because of their high workload older drivers are also at high risk of causing an accident. In addition to intelligent route planning, therefore, greater importance should be attached to regular further training.

An everyday situation in road traffic: your eyes are starting to burn, your eyelids are getting heavier, you are staring straight ahead and you are constantly yawning. A sudden start finally indicates that, for a few seconds, you lost all awareness. These are clear signs of fatigue. Many drivers now start to turn the music up, to open the window and let cold air in or to drink coffee. But does this really help? No! This is not the way to overcome tiredness. The only thing that will help is to stop and take a nap for 10 to 20 minutes. But drivers rarely take a nap. How else can you explain that falling asleep at the wheel, or fatigue while driving, often causes road traffic accidents? A study carried out by the Gesamtverband der Deutschen Versicherungswirtschaft (German Insurance Association (GDV)) shows that one in four motorway deaths can be attributed to the notorious momentary nodding



off (microsleep). A further investigation of all fatal accidents that took place on Bavarian motorways in 1991 shows that around 24 per cent of accidents are caused by falling asleep at the wheel. Two further studies show similarly striking results. A survey carried out in Germany in 2003 showed that 19 per cent of all accidents recorded in the period under investigation were alleged to have been caused by fatigue. And, in an analysis conducted by the European Transport Safety Council, fatigue played a decisive role in around 20 per cent of industrial accidents. The analysis also found that approximately 50 per cent of truck drivers had fallen asleep at the wheel at least once when driving long distances.

This phenomenon of “falling asleep at the wheel” has a great variety of causes. It can be brought on by long-term, cumulative sleep deficit. When a driver is deprived of sleep for approximately 16 hours in two weeks (sleep being limited to six hours or fewer a day over a period of two weeks) similarly serious changes take place in cognitive and psychomotor performance as well as in physiological parameters as after two nights of complete sleep deprivation.

Truck drivers and other drivers of commercial vehicles in particular are at risk of developing sleeping disorders. Irregular working hours, varying waking and sleeping hours – for example starting a journey on Sunday after 10 p.m. if the Sunday ban on transport for trucks exceeding 7.5 tonnes is lifted – are not adapted to the day-night rhythm of a human being and lead to increased fatigue. Fatigue is also further stimulated by the monotonous activity of driving on long, relatively unattractive stretches of road.

SLEEP APNOEA SYNDROME SIGNIFICANTLY INCREASES THE RISK OF ACCIDENT

Because of their predominantly seated activity and, at times, unbalanced diet, many truck drivers also suffer from obesity, which, in turn, increases the risk of coming down with a sleep-related breathing disorder, such as sleep apnoea syndrome. This term covers a number of serious sleep disorders, in which respiratory arrest (apnoea) occurs repeatedly during sleep. Respiratory arrest triggers an alarm reaction in the nervous system resulting in brief transitions to the waking state without the person concerned being fully awake. Although the breathing disorder is brought to an end at that moment, the physiological sleeping

process is briefly interrupted each time. The fragmentation of sleep finally leads to an increase in light sleep, while deep sleep and, to a lesser extent, REM sleep (“Rapid Eye Movement”, also previously known as dream sleep) decreases. As the illness progresses, sleep ultimately loses its recovery function without the person affected consciously experiencing the pathological processes.

This situation results in the consequences of increased daytime sleepiness and an excessive need for sleep. In the meantime, several studies have demon-

strated that truck drivers who suffer from sleep apnoea syndrome are exposed to a much higher accident risk than healthy drivers. Therefore, the risk of a driver becoming involved in a road traffic accident depends on the number of his or her sleep apnoeas per hour of sleeping time. In addition, ten or more apnoeas per hour of sleeping time were shown to be associated with a more than six times increased risk of a car accident.

However, even in humans who do not suffer from a sleeping disorder or a sleep medicine disorder, the performance



Momentary nodding off at the wheel frequently leads to serious accidents.



Regular breaks, among other things, help to combat fatigue at the wheel.

capability is subject to daytime fluctuations. Under conditions of monotony the capacity for sustained attention in the waking phase to remain at a constant level during the day is not possible. There is an increased propensity for sleep especially in the early afternoon, which is generally known as the early-afternoon energy slump. In people affected by increased daytime drowsiness caused by sleeping disorders and sleep medicine disorders, this condition may, however, appear at any time during the day – including during “automated” activity when seated or standing. The light sleep that then occurs exposes the person concerned to the risk of sliding into deep sleep, which is accompanied by a loss of control. The conse-

quences are absent, delayed or incorrect reactions to unexpected or rare events.

LANE-KEEPING SYSTEMS SUPPORT DRIVERS

Striking aspects of accidents caused by the driver falling asleep are, for example, journeys along straight roads, darkness, low traffic density or a long journey time. The majority of accidents caused by the driver falling asleep occur during the period from May to October. In a week, 40 per cent of all accidents occur between Friday and Saturday. A further three-month exhaustive survey carried out nationwide in 2003 to investigate behaviour-related causes of accidents involving

heavy goods vehicles on Federal motorways demonstrated that the majority of accidents occurred between 14:00 and 17:00, i.e., in the so-called mid-afternoon energy slump. Accidents caused by fatigue were characterised in this investigation with greater than average frequency by lane departure (steering manoeuvres not performed at the right time).

Technical possibilities as a way of preventing accidents caused by fatigue are offered by, inter alia, rumble strips, which prevent around 40 per cent of all accidents caused by lane departure, as shown in a study carried out by the Bundesanstalt für Straßenwesen (Federal Institution for Roads) (see box on page 26). Varied road architecture can prevent

Rumble strips as a measure against accidents caused by fatigue

Road safety on motorways can be significantly increased by means of cut-in rumble strips running parallel to the white roadside borderline. This is the result of a pilot experiment carried out by the Bundesanstalt für Straßenwesen (Federal Institution for Roads (BAST)) together with the Landesbetrieb Straßenwesen Brandenburg. In September 2003, 400 millimetre wide and a maximum 13 millimetre deep rumble strips were cut into the hard shoulder on the A 24 in the direction of travel towards Berlin between the road junctions at Herzsprung and Fehrbellin over a stretch of 35 kilometres. The rumble strips were positioned as close as possible to the roadside border but in such a way that, if the hard shoulder were used by the Traffic Operating Department or the emergency services, they would not systematically lie in the lane used by these vehicles.

High economic benefit

In order to assess the effects of the rumble strip on road safety, the incidence of accidents on German roads three years before and three years after the implementation of the measure were analysed. Taking the general trend of accidents on German roads into consideration, the analysis showed that accidents in which the vehicle left the lane to the right fell by 43 per cent. Accidents with serious and fatal injuries fell by 15 per cent. The rumble strips show their potential in particular in the case of accidents resulting from “other errors” – usually inattentiveness, perhaps caused by momentary nodding off: the number of these accidents fell by 34 per cent.

The reasons for the pilot experiment are obvious: every year on German autobahns there are more than 7,000 accidents resulting in personal injury, in which the vehicle driver leaves the lane with his vehicle. In addition to the driver losing control over the vehicle as a result of non-adapted speed or as a result of a collision with another vehicle, many of these accidents are caused by lack of attention, distraction or fatigue. Drivers leaving the lane receive a haptic and acoustic signal from the rumble strips, which increases or re-establishes their attention.

In Germany, in the past profiled edge markings were only used on certain stretches of motorway to prevent accidents through lane departure. However, in contrast to the passenger car, profiled edge marking are barely visible to the driver of a goods vehicle. What is more, they have a shorter lifetime than non-profiled edge

markings, as profiled edge markings are worn away, for example by the winter maintenance service. On the other hand, cut-in rumble strips are a permanently sustainable measure, which is effective for all makes of vehicle.



That the acoustic and haptic signals emitted when a vehicle crosses the cut-in rumble strip can also be clearly felt in goods vehicles is demonstrated by another result of the pilot experiment: the number of accidents involving goods vehicles fell by a good 40 per cent.

The costs of accidents were also significantly reduced by the measure. Simply by reducing the number of deaths and serious injuries, it was possible to reduce the economic loss over the 35 kilometre stretch under investigation by 690,000 euros a year. If one compares these effects with the financial expenditure for the installation of the rumble strips of 170,000 euros, this is

made up for many times over by the economic benefit within a short time.

Against this background, the BAST recommends the use of cut-in rumble strips especially on stretches of motorways on which accidents caused by lane departure to the right as a result of fatigue or inattentiveness occur with above-average frequency. In a further research project the BAST will investigate whether rumble strips will also be able to contribute to improving road safety on dual carriageways.

Source: Federal Institution for Roads



monotony and hence accidents caused by the driver falling asleep. The same is true of driver assistance systems such as the Lane Guard System (LGS) and the Lane Departure Warning System (LDW), which issue a warning in the event of unintended lane departure through an acoustic signal or haptically through seat or steering wheel vibrations, enabling the driver to take the necessary corrective action in good time. But, in the end, only one thing

helps against fatigue and falling asleep at the wheel, and that is enough sleep.

SHARE OF OLDER TRUCK DRIVERS INCREASING RAPIDLY

Germany and Europe are currently experiencing demographic changes that are unprecedented in terms of their extent and impact. While, at the start of the twentieth century, the composition of the population was characterised by the classic pyramid shape – higher birth than death rate – over the last decades, the pyramid has turned upside down. According to the eleventh coordinated population projection by the Federal Statistical Office of Germany, the share of older people (over 65) will rise sharply over the next few decades, namely from

19 per cent in 2005 to more than 30 per cent in 2050. On the other hand, the share of younger people (under 20) will fall from 20 per cent in 2005 to approximately 15 per cent in 2050. The share of people in the so-called active age, i.e. of working age (between 20 and 65), will steadily decline and will be approximately half of the population in 2050.

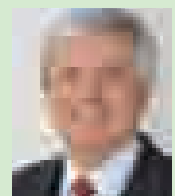
The demographic change will also make itself felt among truck drivers and professional drivers. The statistics of the Kraftfahrt-Bundesamt (Federal Motor Transport Authority) show that, from 2003 to 2006 the share of driving licences issued to drivers of Class C and CE vehicles rose from 4.36 million to 5.61 million. The 40 to 49 age group, i.e. the age group that will account for older drivers in the years to come, in



In breaks from driving relaxation exercises are a good means of averting possible fatigue.



Prof. Dr rer. nat. Wolfgang Schubert, first CEO of Deutsche Gesellschaft für Verkehrspsychologie e. V.



“Truck drivers must be made aware of the consequences of fatigue. It is precisely in the state of reduced vigilance that their ability to judge is diminished. Traffic signs and situations as well as other road users are no longer adequately perceived, which means that drivers no longer react to unexpected events or their reaction comes too late. A concrete example is that the brake light of a vehicle travelling in front is detected too late and this may lead to a collision. Moreover, this detection error corresponds, for instance, to driving under the influence of alcohol with a BAC of approximately 0.4 per cent, thereby also reducing colour sensitivity.”



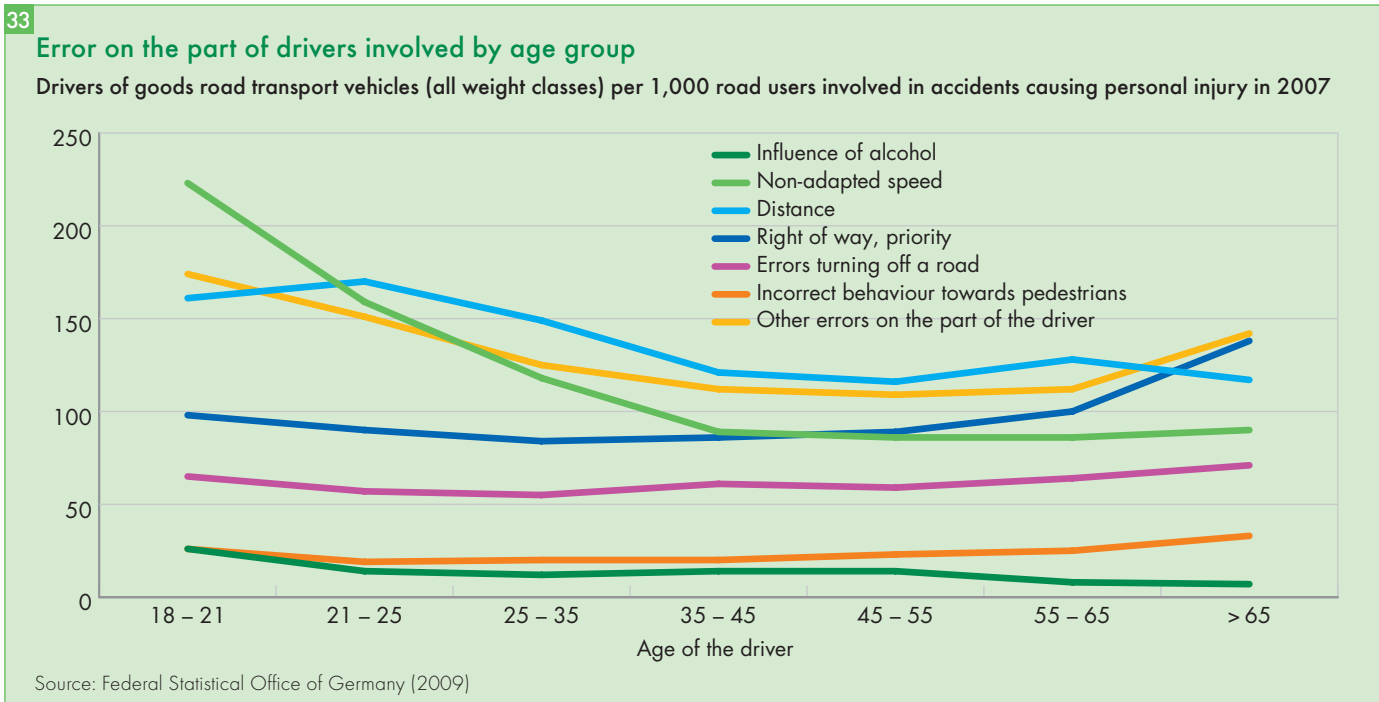
Fatigue on the steering wheel can also reduce the cognitive ability to measure heights and widths.

particular recorded a significant rise. At the same time, there will be steady growth in freight transport, while young truck drivers will be conspicuous in their absence. In the future, there will be more older truck drivers, especially in view of plans to increase the retirement age.

TRAFFIC-RELATED PERFORMANCE IMPAIRMENTS IN OLD AGE

With increasing age, psycho-functional performance, such as resilience, orientation, concentration, attention, ability to react and memory, decrease. In terms of

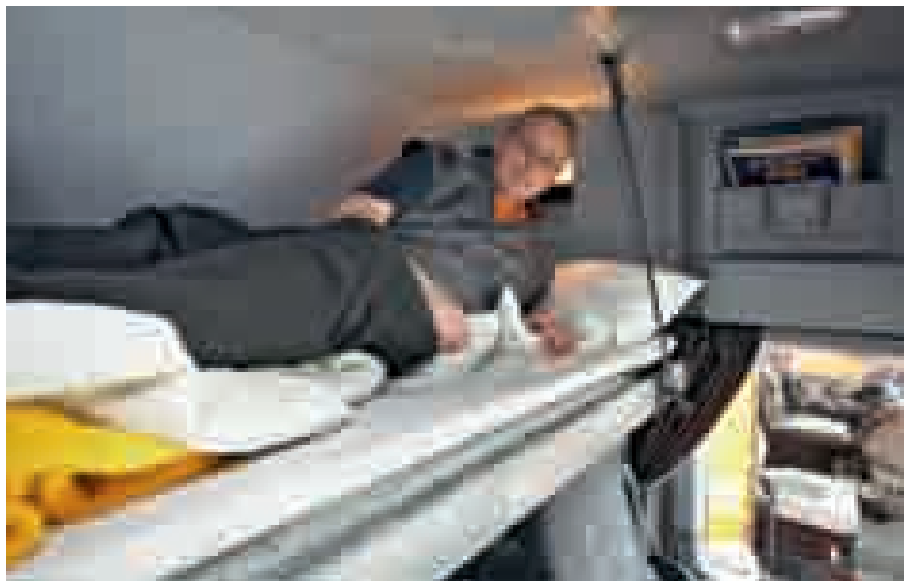
personality, self-control and the capacity for self-criticism – in relation to aspects that impinge on behaviour in road traffic – play a prominent and dominant role. Functionally related and mental impairments can often be compensated for by technical, but above all, by behavioural



measures. Opportunities for compensation arise, for example, from knowledge about existing impairments of the state of health, psychophysical performance, personality changes and the resulting special requirements for adapting behaviour in road traffic. However, truck drivers have fewer opportunities for compensation than drivers of passenger cars, who use their vehicles for private purposes. As a result, truck drivers are tied to a strict division of time and are unable to take account of time of day, weather conditions, duration of journey or choice of route. While drivers of passenger cars can for example avoid journeys during peak traffic periods or at night, this is not possible for truck drivers.

REVEALING ROAD TRAFFIC ACCIDENT DATA

An analogy between drivers of passenger cars and truck drivers can be drawn, however, in the analysis of road traffic accident data: From the age of 65 the risk of drivers of goods vehicles being involved in an accident resulting in personal injury rises. Human error also increases in certain areas. Offences relating to right of way and distance as well as turning manoeuvres play an important role. On the other hand, human error on the part of older drivers of goods road transport vehicles is not characterised by driving while under the influence of alcohol or error in overtaking or entering traffic and starting after coming to a halt (Charts 33 and 34).



In the sleeping cabins of today's goods road transport vehicles there is enough room for relaxing rest periods.

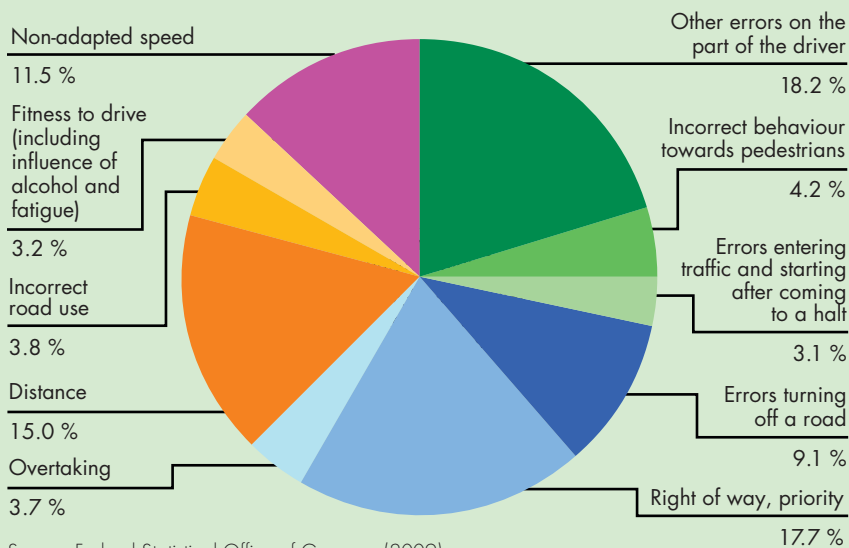
Light conditions also have an impact on the accident risk. In the dark, older truck drivers are at greater risk of committing errors relating to right of way and priority as well as driving too close to the car in front and non-adapted speed. It is clear that, when driving at night, they misjudge speed and distance. Avoiding travelling by night as a compensation strategy is, however, as mentioned above, not possible for truck drivers or professional drivers. When assessing the ability to see therefore, in addition to testing for central day vision

as well as colour and stereo acuity, it is important not to neglect mesopic vision and sensitivity to glare.

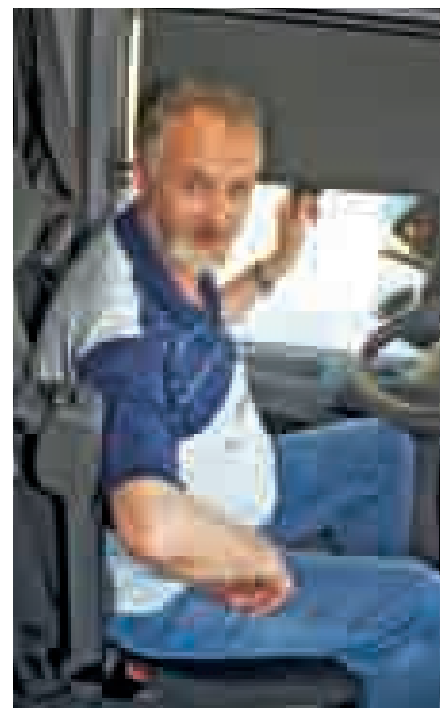
Because of their long working day, truck drivers are exposed to different stresses and strains than drivers of passenger cars. As well as long working hours, stresses and strains are mainly caused by frequent night journeys, heavy traffic, and the pressure of deadlines and bad weather. Truck drivers over sixty years of age in particular regard loading and unloading as well as boarding and alighting and load securing as special

34 Error on the part of drivers involved aged 65 and over

Drivers of goods road transport vehicles (all weight classes) per 1,000 road users involved in accidents causing personal injury in 2007



Source: Federal Statistical Office of Germany (2009)





During roadside inspections the police carefully examine whether the prescribed drivers' working hours have been adhered to.

stresses and strains. The high level of stress and strain leads, in turn, to symptoms of fatigue, which is increased by the monotonous task of driving. Breaks, which would now be necessary, are often not long enough. The result – as already explained in detail at the start of this section, is the development of an irregular sleeping pattern, which ultimately leads to a higher risk of accident due to fatigue. Family problems as well as poor health and a poor diet also have an adverse effect on truck drivers. As a result, truck drivers suffer permanent health problems, which they often ignore for fear of being laid off.

In the light of the development illustrated above, measures for truck drivers are indispensable and should be targeted at increasing road safety and, in particular, at protecting the health of truck drivers. In this context, in contrast to holders of a Group 1 driving licence

periodic aptitude tests for those who obtain and hold licences for Class C, C1, D and D1, etc. vehicles under Annex 5 (to Section 11(9), Section 48 (4) and (5) of the Verordnung über die Zulassung von Personen zum Straßenverkehr (Fahrerlaubnis-Verordnung) (Driving License Regulations) make a valuable contribution because of the special requirements of these drivers. In addition to regular road safety training and advanced training measures for truck drivers, advanced training measures are also recommended for employers and expeditors to raise their awareness of route planning, logistics and health in connection with the special requirements of their older truck drivers.

Better design of the work place in the form of an ergonomic driver's cab, modelled to suit the age of the driver, can relieve the stresses and strains on the driver. Last but not least, assistance at the

point of unloading is also conceivable, as this will reduce the strain on older truck drivers. The reason for this is that, when drivers are under less strain, there is also less risk of them causing an accident through fatigue. Driver assistance systems, for controlling distance for example, can also make an important contribution to reducing the frequency with which accidents involving goods road transport vehicles occur. But more of this in the section entitled "Vehicle safety".

DRIVERS MUST WEAR THEIR SEAT BELTS

The seat belt is without doubt a motor vehicle's most important passive protection device. This applies equally to all classes of vehicle, i.e. from the smallest van to the heavy goods vehicle.

As a restraining system in the vehicle, when worn the seat belt protects the

occupants of the vehicle from being flung around inside the vehicle and from being flung out of the vehicle. Because the seat belt is directly connected to the body of the vehicle, the passengers benefit fully from the effect of the crumple zone. The combination of the defined extensibility of the webbings with belt tensioner and belt force limiter means that the deceleration values for the occupants wearing a seat belt remain acceptable, even in serious collisions. The remaining components of the passive safety equipment such as airbags and head supports are also dimensioned for occupants wearing a seat belt and can only provide the optimal protection when the belt is worn.

The fact is that, in the last ten years, countless technical developments in the area of passive and active safety have contributed to increased safety. However, many of these systems have not yet been fitted in heavy goods vehicles to the desired extent. One reason for this may be that, in the case of accidents involving goods vehicles, the consequences of an accident for the driver of the truck are much less serious than for the other road user involved.

As data provided by the Federal Statistical Office of Germany on accidents involving goods vehicles demonstrate, in 2007, with 215 occupants fatally injured, the share of the total number of road traffic accident fatalities (1,095) in accidents involving goods vehicles was approximately 20 per cent. 80 per cent of fatalities were therefore cyclists and motorcyclists, pedestrians and occupants of passenger vehicles. For the segment of HGVs having a maximum permissible weight exceeding twelve tonnes and articulated trucks alone the 70 occupants of trucks who were fatally injured in 2007 accounted for "just" 6.4 per cent of the total number of deaths involving goods vehicles. The perceived stronger feeling of safety among drivers of heavy goods vehicles could, under certain circumstances, also be an explanation for the lower rate of seat belt use.

THE "HAT'S GEKLICKT?" CAMPAIGN HELPS TO SAVE LIVES

With the introduction of the general compulsory use of safety belts in passenger cars and the punishment of violations in the 1970s the number of fatal injuries to car occupants declined significantly. Since 1992 all newly registered goods vehicles have had to have safety belts, which must then be worn. Current traffic observations by DEKRA Unfallforschung show,



Safely on the move ...



... only by wearing a seat belt.

however, that only about half of all drivers of goods vehicles having a maximum permissible weight exceeding 7.5 tonnes wear their seat belts on motorways. On dual carriageways the rate of seat belt use is even lower, and only one in four drivers wear their seat belts in built-up areas. In comparison to the first traffic observation from 1999 there have clearly been improvements, but the overall level is still much too low.

The reasons for the low rate of seat belt use are many and varied, as shown by surveys of professional drivers. The large, heavy vehicles, with a high seating position, in an environment dominated by passenger cars, often give drivers a false feeling of security. The seat belt is also often seen as uncomfortable or even restricting. But overestimating their own driving ability frequently leads drivers not to use their seat belts. Analyses of the



At the DEKRA Symposium for Commercial Vehicles 2008 in Neumünster the difference between wearing a seat belt and not wearing a seat belt was impressively demonstrated in a crash test.



Under the aegis of the German Transport Safety Council (Deutscher Verkehrssicherheitsrat (DVR)) the joint "Hat's geklickt?" campaign for truck drivers got off to a successful start in 2002 with a number of DVR members and partners from industry, the media and associations, including DEKRA.

actual accident situation, however, show repeatedly that serious collisions can be survived with relatively slight injuries thanks to the seat belt. However, they also show how drivers of trucks who do not wear their seat belt die in relatively minor collisions without major damage to the cab because they are flung out of the vehicle and are then frequently run over by their own vehicle.

With the "Hat's geklickt?" campaign, in 2002, under the leadership of the Deutscher Verkehrssicherheitsrat (German Transport Safety Council), a project was introduced to increase drivers' awareness of the dangers posed by their failure to wear a seat belt through various main campaigns. Crash tests, prepared real accidents and a roll-over-simulator impressively indicated how important it is for a truck driver to wear a seat belt. The huge success of the campaign has encouraged all those involved to continue.

PROFESSIONAL DRIVER QUALIFICATION: ONE'S TRAINING IS NEVER FINISHED

An essential element of the prevention of accidents has always been the initial qualification and periodic training of drivers. The Berufskraftfahrerqualifikationsgesetz (German Drivers' Qualification Act (BKrFQG)) was adopted by the Federal Council in July 2006 to comply with Directive 2003/59/EC of the European Parliament and of the Council of 15 July 2003 on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers and is therefore an important contributor towards improved safety on Europe's roads. The said Directive will also contribute to a common initial qualification and periodic training situation within the EU. In the future, as well as having the relevant driving licence, truck drivers will have to demonstrate

special activity-related skills and knowledge through a basic qualification (for new entrants) and also through regular further training. Anyone who, as an entrepreneur, arranges or authorises journeys without the relevant qualification must anticipate a fine of up to 20,000 euros. This also applies to drivers who drive without the necessary qualification.

Under the Act, truck drivers who obtain a driving licence for Class C1/C1E/C/CE vehicles for the first time after 10 September 2009 must provide proof of their basic qualification. This can be done either by completing a vocational training programme in the recognised occupations requiring formal training "professional driver" or "employee qualified for driving on the road", through success in a 240-minute practical examination at an Industrie- und Handelskammer Chamber of (Industry and Commerce (IHK)) or in the context of the "accelerated initial qualification" through participation in a 140-hour course at a recognised training establishment and success in a 90-minute theoretical IHK examination. Truck drivers can be trained and be prepared for the IHK examinations at service providers such as DEKRA Akademie.

Regular further training is also indispensable for daily operation. Here too the BKrFQG introduces an important change: from 10 September 2009 every truck driver in possession of a driving licence of the classes mentioned above must provide evidence of 35 hours of further training every five years. The further training

Simulator-supported driver training

Under the name "ProFahrT" - Professionelles Fahrer Training (Professional Driver Training) DEKRA offers drivers of commercial vehicles training at the highest technical level available today. The training device consists of an original driver's cab for trucks and appropriately configured computer technology. Training in the driving simulator is today an integral component of the initial qualification and periodic training of drivers at DEKRA. Here, drivers can be trained in the most diverse traffic situations, from normal to dangerous, on all road

types, and under all conceivable weather conditions. From that point on, driving a real vehicle is more economical, effective and environmentally friendly. Emergency situations can be repeatedly practised without risk under constant conditions. In this way DEKRA makes an important contribution to active road safety. Every day, training is provided in the simulator in Norderstedt and can be booked both as a DEKRA seminar and as an individual corporate seminar.

Grants for initial qualification and periodic training of drivers

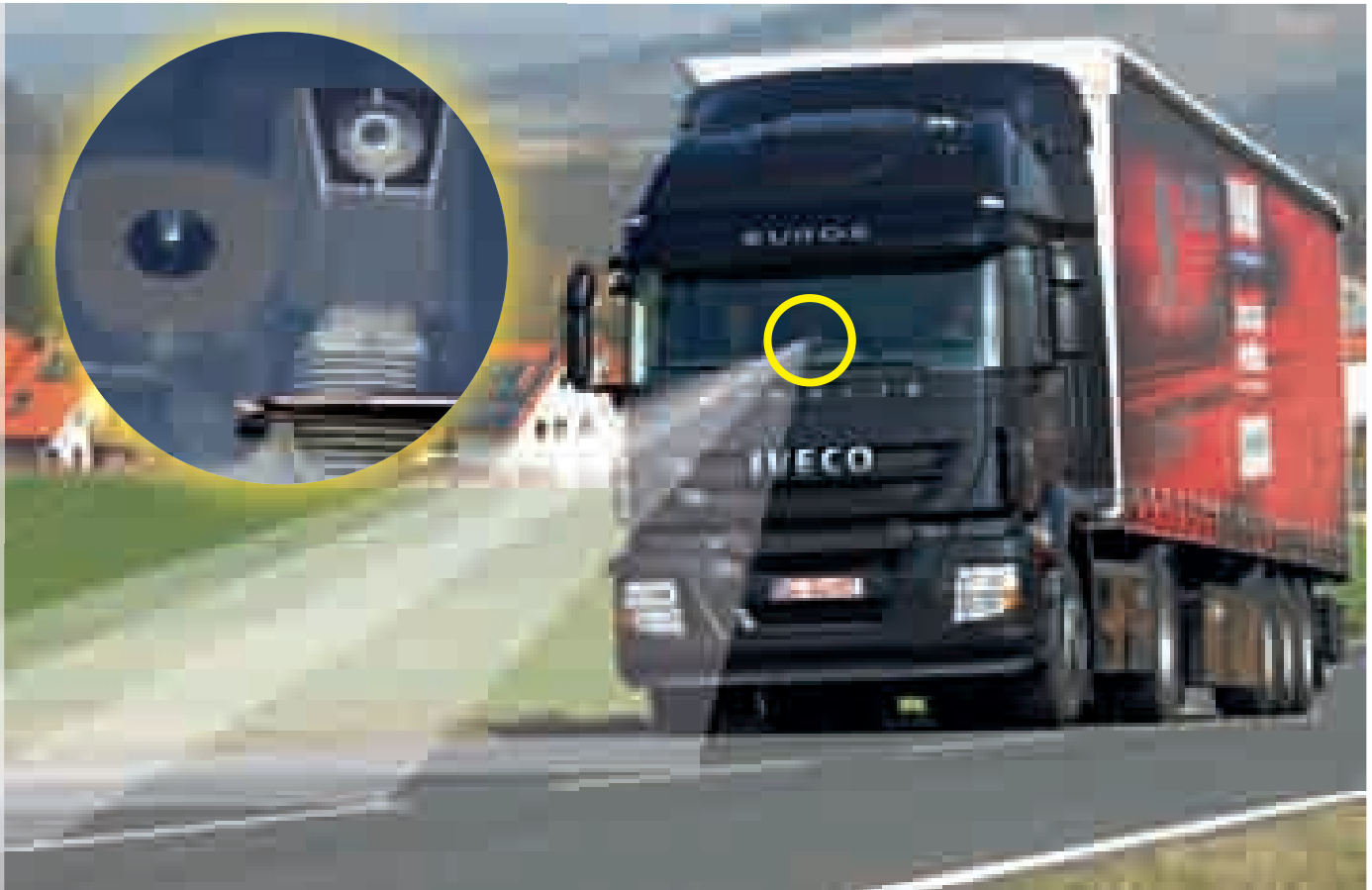
The initial qualification and periodic training of drivers in companies involved in the transportation of goods subject to the payment of a toll will continue to be supported in Germany. According to the Federal Ministry of Finance, in 2010 and 2011 grants will be awarded of 29 million euros and then, in 2012, of 19 million euros. The grants, which, in 2009, will total

85 million euros, are being awarded to combat the shortage of skilled workers in the road freight industry and to ensure that workers are qualified at a high level over the long term. Support is being given to provide apprenticeships for drivers and for further training measures such as courses, seminars and training programmes.

must take place through participation in a course at a recognised training establishment such as DEKRA Akademie. Topics covered include safety engineering and driving safety, load securing and (social) regulations for the transport of goods to give just a few examples.



Many traffic scenarios can be practised during simulator-supported training to ensure that driving is more economical, effective and environmentally friendly.



Safely on the move on all roads

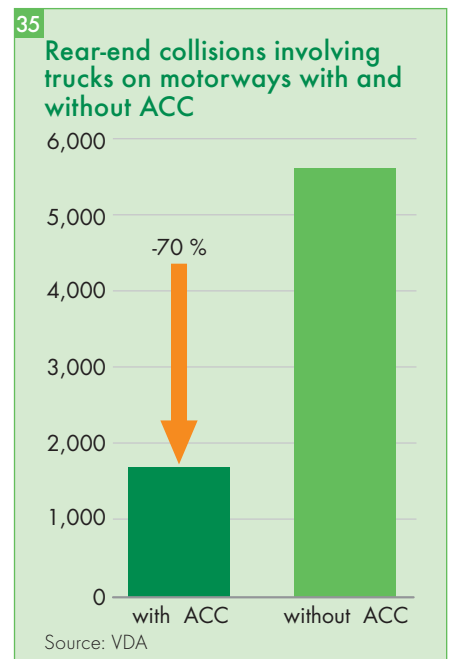
Electronic driver assistance systems, load securing, tyres, rear-view mirrors, vehicle construction, risk management, rescue from a articulated truck involved in an accident: there is still enormous vehicle-related optimisation potential for reducing the number and the consequences of accidents involving trucks.

The trend is certainly positive: although traffic density and transportation have increased significantly in the last 15 years the number of deaths resulting from accidents involving trucks has fallen by 40 per cent and the number of serious injuries by 35 per cent. Be that as it may, far too many serious accidents, such as collisions between trucks and pedestrians and lane departure, are still taking place. This costs human lives on a daily basis, leads to serious injuries and always results in high costs. The reason for this is that, when accidents involving goods road transport vehicles occur, they often have serious consequences, in which the size and the weight of the vehicle play a decision role.

Accident researchers are therefore unanimous that equipping heavy commercial vehicles with driver assistance systems offers huge potential for preventing accidents. The Electronic

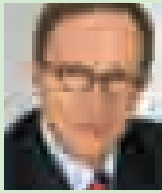
Stability Program (ESP), distance-regulated Adaptive Cruise Control (ACC) or electronic lateral support (lane departure warning and lane change assistant) (LGS) are just three examples. These systems can make a significant contribution to eliminating deficits in the gathering and processing of relevant driver information, avoiding or helping to mitigate driver error, and reducing the strain on drivers caused by mental overload or underload. On balance, drivers will be supported through information, warnings and, if necessary, through intervention in their driving task.

As many investigations have demonstrated, such systems have the potential to be extremely effective. According to a study carried out by the Allianz Zentrum für Technik (AZT), serious accidents causing personal injury could be avoided or their effects alleviated by up to eight per through the widespread use of elec-





Matthias Wissmann,
Chairman of the
Association of the
Automotive Industry
(VDA)



“The German commercial vehicle industry has not only set the benchmarks for the rest of the world to follow in terms of the efficiency of their vehicles but it has also invested heavily in vehicle safety and in numerous innovative assistance systems to support drivers and help prevent accidents. These include ESP, brake and lane guard assistants, as well as lane change assistants. We strongly believe that these assistance systems will be in increasingly greater demand among customers.”



Insufficient safety distance should no longer be an issue with the corresponding electronic driver assistance system.

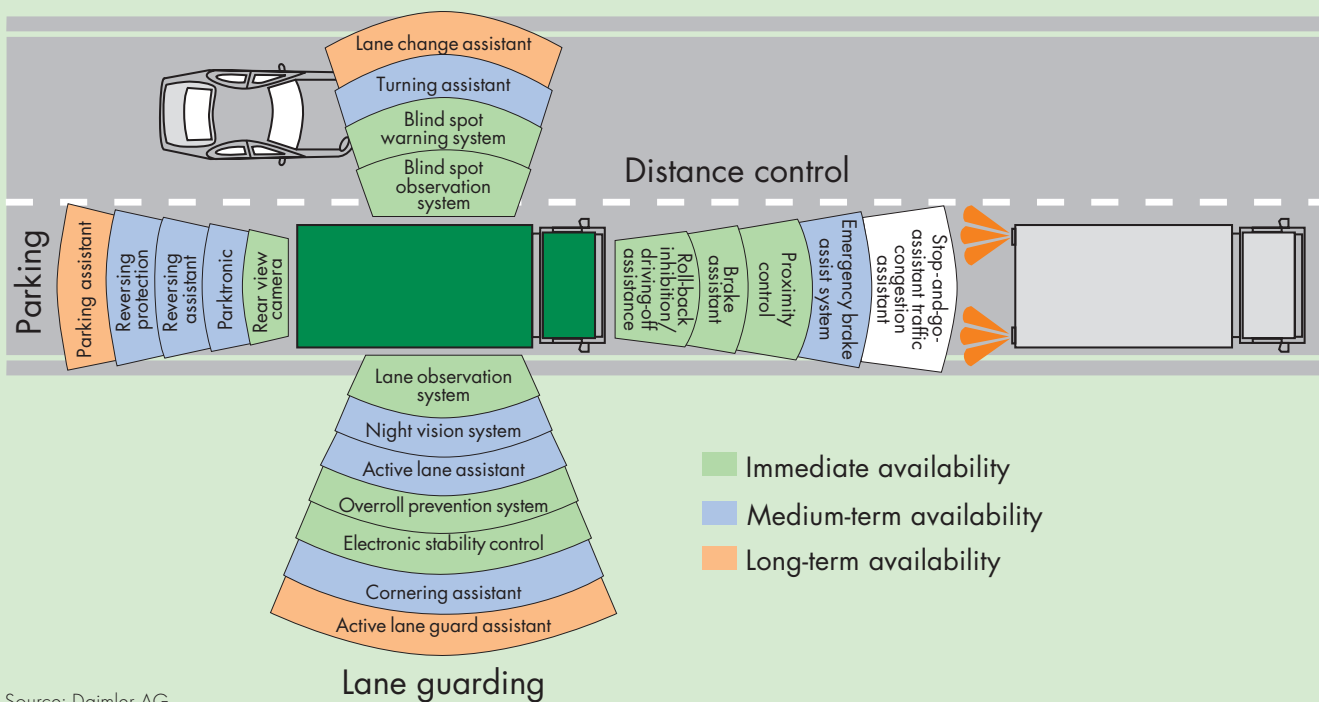
tronic stability programs, by up to seven per cent through distance-regulated ACC, and by up to four per cent through electronic lateral support. ACC and LGS are very effective especially on motorways. With the current ACC more than a third of serious accidents involving collisions with the vehicle in front and, with LGS, almost two thirds of accidents resulting from lane departure could be prevented (Charts 35 and 36).

A similar conclusion regarding the ESP was reached by a study carried out by the Unfallforschung der Versicherer (German Insurers Accident Research (UDV)) together with the manufacturer Knorr-Bremse and the Lehrstuhl für Fahrzeugtechnik der Technischen Universität München (Institute of Automotive Engineering at the Technical University of Munich). According to this study, the number of serious accidents



Electronic driver assistance systems will in the future play an even greater role in trucks.

36 Assistance systems for the active safety of commercial vehicles – today, tomorrow and the day after tomorrow



Source: Daimler AG



Campaign by BGL, BGF and KRAVAG-Insurance.

Safety initiative by Daimler Trucks, DEKRA and Allianz-Insurance.



involving trucks could be reduced by nine per cent if the truck was fitted with the ESP. Reverse cameras also have the potential to prevent serious accidents resulting in personal injury, though their main use lies in preventing physical damage caused while reversing.

CREATE FINANCIAL INCENTIVES

Investment incentives could, without doubt, be a very promising step towards

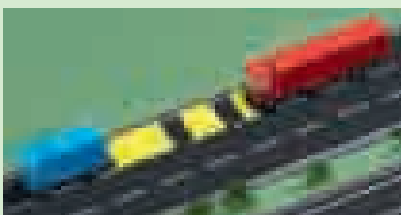
achieving greater acceptance. These could include insurance discounts, manufacturers' security packages at cost price and offers from testing and training organisations. These approaches have been first realised in the safety initiative "Safety Plus" by Daimler Trucks, DEKRA and Allianz Insurance, which was published in 2006.

In 2008 the Berufsgenossenschaft für Fahrzeughaltungen (Employer's Liability Insurance Association for the Vehicle

Five selected driver assistance systems in focus

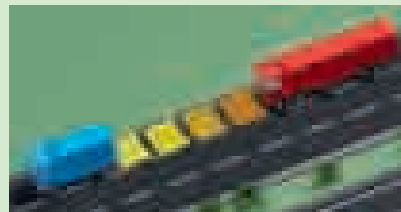


• **The Electronic Stability Program (ESP)** is a ride dynamics control system with sensors that constantly measures the dynamic status of the vehicle and intervenes in the brake management system if there is a risk of skidding or tipping over – and even in the engine management if necessary. ESP is thus able to recognise hazardous situations quickly and reliably, keeping the vehicle controllable within the physical limits. Typical accident scenarios such as cornering too fast, slippery road surfaces, emergency braking and hectic evasion manoeuvres can be defused and the risk of accidents significantly reduced. The general distribution of the ESP will not only save lives, it will also reduce congesting resulting from accidents involving heavy goods vehicles.



• **The Adaptive Cruise Control System (ACC)** is an extension of the normal cruise control and automatic braking systems. It uses radar sensors to determine the distance and differential speed to the preceding vehicle and, on the basis of its own speed, calculates a suitable distance to this vehicle. ACC then adjusts its own speed to that of the preceding vehicle and maintains an appropriate safe distance. ACC can be used from a road speed of 25 kilometres

per hour upwards, but its main sphere of operation is on dual carriageways and motorways. However, the current system is not yet geared towards detecting standing obstacles.



• **The Active Brake Assist System (ABA)** is based on the radar system of the active cruise control system and is intended to contribute to preventing rear-end collisions or, at the very least, to reducing the speed of collisions. If there is not enough distance between the truck and the vehicle in front, the truck driver will initially be warned by an optical signal. If he does not react, an acoustic signal will follow. If the driver still does not react partial braking will be automatically triggered. If no reaction on the driver's part is detected despite these escalating warnings, the active brake assistant automatically initiates full brake application to bring the vehicle to a halt. If the driver still does not react the vehicle will be brought to a halt. The ABA cannot yet detect standing obstacles.



• **The Lane Guard System (LGS)** and Lane Change Assist System (LCA) warn the driver if he is inadvertently straying from his

lane. It is a valuable aid, especially on long and monotonous stretches of road, where the driver's attention may well lapse. A video camera behind the windscreen records the course of the lane and evaluates the lane markings by digital means. If the system detects that the vehicle is leaving the lane without the direction indicator being actuated, the driver will hear an acoustic signal and will then be able to correct his course.



• **The Turning Assistant System**, an electronic system that detects and interprets the driving environment, prevents drivers from failing to see other road users such as pedestrians or cyclists. Turning errors are often the cause of serious accidents involving these "unprotected" road users. When a truck stops at a road junction or a red light for example sensors monitor the environment around the driver's cab from one metre to approximately two metres and calculates the distance to the objects within that range. If a pedestrian or cyclist approaches the vehicle while it is stationary for example the sensors calculate a new, shorter distance. If the measured distance is below a specified measurement, the truck driver is warned by an optical signal. When the truck driver wants to drive off and there is still an object in the danger zone close to the truck, he will also be warned of the risk of collision by an acoustic signal.

Operating Trade (BGF)), the Bundesverband Güterkraftverkehr Logistik und Entsorgung e. V. (Federal Association of Road Haulage, Logistics and Disposal (BGL)) and KRAVAG Insurance launched the “Sicher. Für Dich. Für Mich” campaign. The aim of this initiative was to increase the distribution of driver assistance systems. To this end, the BGF provided two million euros for trucks to be fitted with proximity cruise control, lane assistants, lane-change assistants, and the Electronic Stability Program (ESP). And success was swift: within five months the budget was almost exhausted.

The politicians are therefore being urged to contribute to greater safety, as in the field of the environment, through suitable framework conditions and funding. A first step has already been taken: from 2009 the Federal Ministry for Transport, Building and Urban Affairs will fund projects by road haulage companies, including in the area of safety, from receipts from the truck toll.

The annual maximum grant awarded will, as part of the “De minimis funding programme”, be dependent on the number of heavy commercial vehicles registered to the applicant companies in accordance with traffic regulations. Within this maximum amount, a company may, for example, receive non-repayable grants of 33,000 euros a year for the purchase of driver assistance systems.

To this end, a Commission Regulation (EC) was adopted according to which newly developed models of commercial vehicles will have to be equipped with ESP from 2011 in order to obtain EU type approval. In addition, from 2012 newly developed trucks will have an electronic emergency brake system and



The electronic driver assistance systems should also be checked during the main inspection.

a lane assistant. According to initial estimates, in the EU alone approximately 2,500 human lives will be saved every year, of which around 500 will be attributable to ESP, 1,000 to the electronic emergency brake system and 1,000 to the lane assistant. Outside the EU there will also be approximately 2,000 to 2,500 fewer road traffic fatalities, if manufacturers fit their vehicles for all markets with ESP.

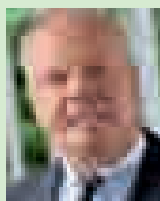
ELECTRONIC SYSTEMS MUST ALSO BE CHECKED PERIODICALLY

If electronic driver assistance systems are integrated into a vehicle, it must of course always be possible to rely on them functioning properly. That is why such systems and components should be generally checked at a European level as part of the main inspection. As various investigations have shown a vehicle's electronics are subject to a certain wear and tear. They are not free from system failures and can be manipulated, switched off and removed from the vehicle. Investigations by the Internationale Vereinigung für die Technische Prüfung von Kraftfahrzeugen (International Motor Vehicle Inspection Committee (CITA)) have shown that electronically controlled systems display, by way of comparison, the same failure rates as mechanical systems, which are categorised as important enough to be included in periodic inspections. The failure rates of electronic systems increase with both the age and the mileage of the vehicle.

To determine which electronically supported systems are integrated into a vehicle and whether they work properly the experts in Germany have had access



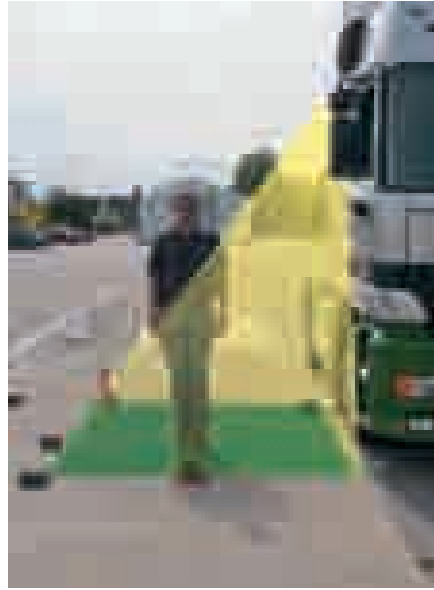
Volker Lange, Chairman of the International Association of Motor Vehicle Manufacturers (VDIK)



“International motor vehicle manufacturers focused on constantly improving the safety technical equipment of heavy goods vehicles worldwide at an early stage. These improvements made a significant contribution to reducing the death toll on our roads to its current low level while the number of vehicles has quadrupled. In order to achieve the objective of the EU Commission of halving the number of fatalities in Europe by 2010, driver assistance systems and their linking play a decisive role. The international automotive industry and its suppliers have set themselves this challenge.”



A comparison of old and new rear-view mirrors using the close-proximity rear-view mirror as an example.



to a comprehensive system database since January 2006. In order to set up this database 13 monitoring organisations, including DEKRA, founded FSD Fahrzeugsystemdaten GmbH based in Dresden in October 2004 specifically for this purpose. The creation of the system database is largely based on information from vehicle manufacturers and importers about the systems built in to their vehicles as well as the relevant test procedures to be applied. With the help of the data provided in the system database, the test engineers will be able to determine whether the prescribed safety level of the vehicle is reduced as a result of defects, changes or add-ons for example.

BETTER REAR-VIEW MIRROR SYSTEMS TO COMBAT BLIND SPOTS

Accidents involving trucks very often happen because of the difficult visibility conditions with a very large blind spot. This is the case in particular when trucks turn right, which is one of the most dangerous situations in road traffic especially for pedestrians, cyclists and moped drivers. Not only do children incorrectly assess the truck driver's field of vision but also pedestrians and cyclists frequently get into a blind spot if they stop at a road junction directly alongside a truck, where it is impossible or difficult for the truck driver to see them. If the truck then turns

right, they are in great danger of being run over. This problem is worse in cases where the unprotected road user who is driving straight ahead wishes to pass a truck on the right – in the belief that the truck driver can see him and confident that he has priority. According to the European Parliament, Europe-wide every year around 400 pedestrians and cyclists die in identical or similar situations caused by the poor visibility of the truck driver.

However, the problems of visibility are not restricted to unprotected road users; truck drivers are also often unable to see passenger cars in close proximity because they are concealed. They are out of the driver's field of vision beneath the lower edge of the windscreen or behind an obstacle such as the A-pillar of the driver's cab. The restricted visibility from the truck is a special burden for truck drivers, which makes their driving task more difficult.

The EU therefore reacted and prescribed the obligatory introduction of new safety devices especially for trucks, including rear-view mirrors to reduce blind spots and to improve indirect vision (Directive 2003/97/EC). The new rear-view mirror systems can now seamlessly show a two-meter wide strip in front of and to the right alongside the truck. This is intended to reduce the number of fatally injured and seriously injured road users significantly. This regulation has applied to newly registered vehicles since 26 January 2007. Directive 2007/38/EC provides for the retrofitting, by not later than 31 March 2009, of mirrors to heavy goods vehicles having a maximum permissible weight of 3.5 tonnes that were originally registered on 1 January 2000 or later.

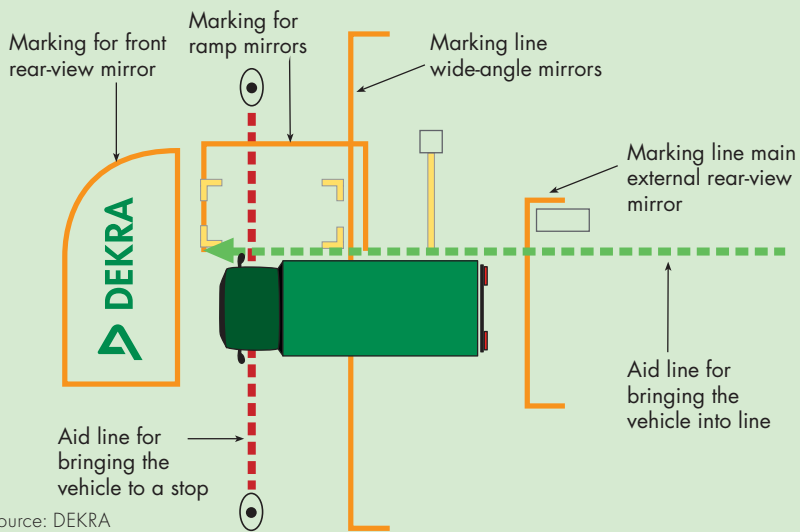


New mirror systems will improve the truck driver's indirect field of vision.



Guide to adjusting mirrors

Only commercial vehicles with old and new mirrors. To improve the all-round vision of drivers in the cab of left turning trucks.



Source: DEKRA

There is a problem, however, in that fitting and retrofitting wide-angle and close-proximity mirrors on the passenger side may well improve visibility on the passenger side, but it cannot cover the whole area that is visible through the new mirror systems. It must also be borne in mind that such new regulations can only increase safety if the driver is also able to adjust and use these technical aids appropriately. Mirrors that show more of the body of the truck than of the surroundings only give the driver limited information.

The investigation by DEKRA shows, however, that many truck drivers do not know what the new mirrors are capable of. In the usual driving situations the mirrors are therefore often used insufficiently. Relevant training measures are therefore crucial. In cooperation with Mercedes Benz and MAN DEKRA has also developed an innovative method enabling drivers to adjust their mirrors with maximum effect in the shortest possible time (Chart 37). Ideally suited for this are the approximately 100 mirror settings that currently are available in Germany. The method is a further contribution from DEKRA towards implementing the objective of the EU Charter on reducing the number of fatally and seriously injured road users.

REFLECTIVE MARKINGS ON COMMERCIAL VEHICLES

A large number of accidents involving trucks occur in bad weather conditions,

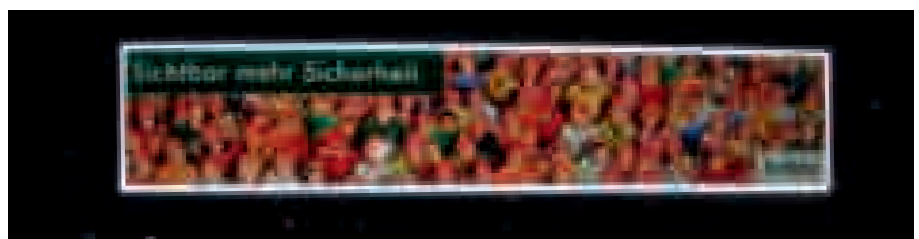
at dusk and at night. One of the reasons for this is the often inadequate visibility of the vehicle and the attendant risk of nose-to-tail collisions involving following vehicles. Retro-reflective markings

on commercial vehicles must therefore be seen as an active contribution towards greater road safety by enabling vehicles to be clearly recognised from a great distance, thereby reducing the number of nose-to-tail collisions in the long term.

In many countries such markings have been prescribed for years. In Germany, however, they have just been described as permissible. With the updating of the international regulations of the UN ECE R 48 (Fitting of lighting equipment to vehicles) in conjunction with UN ECE R 104 (Design of retro-reflective markings to improve the visibility of heavy and long goods vehicles and their trailers), which are also applied by Germany, the fitting of reflective markings throughout Europe will now gradually become obligatory.

Retro-reflective markings in accordance with ECE regulation 104 (with type C tapes) have been prescribed since October 2007 for new types of commercial vehicles – including categories N2 and N3 (maximum permissible weight exceeding 7.5 tonnes, over 2 metres wide, over 6 metres long) as well as their trailers. They are also prescribed from the time of the original registration of the vehicles con-

Retro-reflective markings offer the best visibility.





For efficient rear underrun protection the floor distance must not be too great.



Effective lateral protection: When a passenger car crashes into the (current) standard palette box, there is deformation reaching as far as the area behind the driver's seat. The airbag is not released. On the other hand, the passive safety integrated in the passenger car can be effective. The deformation ends in front of the windshield. The airbag is released.

cerned after October 2009, if the fitting of the lighting equipment in accordance with ECE Regulation 48 (sequence no 03) has been approved.

A distinction is made between full contour, partial contour and line markings. The bands used must carry the corresponding ECE approval mark. Discrete advertising is allowed inside a full contour marking by means of weakly reflecting bands (type D and E), but currently only on the side surfaces. A field trial being carried out under the supervision of the Regional Administrative Authority Darmstadt (Regierungspräsidium Darmstadt), in which DEKRA is also involved, is aimed at demonstrating the innocuousness of retro-reflective markings inside a full contour marking on the rear end of the vehicle.

IMPROVING UNDERRUN PROTECTION SYSTEMS FURTHER STILL

In accidents involving goods road transport vehicles, the majority of fatally and seriously injured road users are passenger car occupants. The numbers provided by the Federal Statistical Office of Germany demonstrate this emphatically. In 2007 in Germany, in accident scenarios involving a passenger car and a truck, there were 19 deaths among truck occupants and 356 deaths among passenger car occupants. There was a similar picture in 2006. In both head-on collisions and nose-to-tail collisions the consequences can be equally devastating.

Although rear underrun protection has been part of the standard equipment

of trucks and trailers for decades, accidents in which a car collides with a truck often end in serious injuries, sometimes even fatal. Because the distance between the bottom of the vehicle and the road is too great and because its structures are overburdened, the fixed underrun protection does not always withstand the speed of impact of a vehicle colliding from the rear. The underrun protection available on the truck gives way or even snaps off. The body structure of a passenger car designed for a crash cannot therefore come into effect and the passenger car underruns the body of the truck.

Accident researchers therefore regard stricter test requirements for rear underrun protection as necessary. This is because the statutory regulations for this safety feature still stem from the 1970s. Although the most recent EU Directive tightened them up to some extent, they are, in the opinion of accident researchers, still unsatisfactory. This was also demonstrated by the EU "VC-Compat" project on vehicle crash compatibility. It is not enough simply to increase the static stability of the rear underrun protection, the dynamic load in reality must be adequately simulated and the distance between the bottom of the vehicle and the road must be reduced. With front underrun protection, which has been prescribed for new trucks with a maximum permissible weight exceeding 7.5 tonnes since 2003 in the EU, there is also a need for improvement. After a collision with a passenger car a structure at the front of the truck, which absorbs impact energy, would increase the survivability of passenger car occupants further still.

There is, finally, further potential for optimisation in the area of side protection, which is why it was paid a great deal of attention in the context of the APROSYS (Advanced PROtection SYStems) road safety project funded by the EU. The background to this project is that the current side protection of a truck is designed for an impact with an unprotected road user, such as a cyclist or a pedestrian, and to prevent them from rolling under the vehicle. Now, however, efforts are under way to introduce lateral underrun protection to absorb the lateral impact of a passenger vehicle and to prevent it from rolling between the axles. The problem that needs urgent attention is that the safety elements integrated in the passenger car cannot work because the predefined deformation zones are "grasping at nothing". The airbag is not released.



APROSYS has therefore considered and assessed various concepts. A relatively simple possible variant is the redesign of the palette box. The demonstrator of APROSYS emerged through the almost exclusive use of standard elements, some of which were integrated rotated by 90 degrees, thereby producing a brace against a side impact.

ACCELERATING THE RESCUE OF TRAPPED TRUCK DRIVERS

The protection of truck occupants in collisions enjoys a very high priority among vehicle manufacturers. As well as restraining devices such as the seat belt and the airbag, such protection includes, in particular, reinforced passenger cabins for maintaining the survival space and complex cab mountings. However, if truck occupants are trapped in their vehicles as a result of a collision, the fire services face a particular challenge. The use of

high-strength steel to make structures more rigid and the ever-increasing height of vehicles make rescue more difficult, as the hydraulic rescue equipment reaches the load limits and tactical procedures need changing.

From a medical point of view, it should take no longer than one hour to deliver accident victims to a trauma clinic after an accident has occurred. Through early full medical care the chances of recovery improve and the rehabilitation processes are shortened. The derived "Golden Hour of Shock" leaves a period of no more than 20 minutes to free trapped patients. It is currently not uncommon for it to take more than an hour to free the most seriously trapped occupants.

To improve this situation, Mercedes-Benz accident-analysis for trucks worked out the first truck rescue-guidelines. Taking this as a basis, on account of emergency doctor Dr. Rainer Zinser of



Shorter rescue times mean that trapped truck occupants can be helped more quickly. DEKRA has therefore supported the development of special rescue guidelines.



Lack of tyre care is a danger for all road users.

Oberschwabenklinik Ravensburg, common guidelines have been developed for the use with all cabovers. They were developed in co-operation with Mercedes-Benz, MAN and the fire brigades. Series of experiments, several of them in the DEKRA crashtest-centre in Neumünster, proved the effectivity of the standards worked out. By the especially developed ways of cutting and strictly defined toe-holds for the hydraulic rescue apparatus, time for rescue itself have been shortened

significantly, while at the same time, a gentle way of rescuing is assured.

TAKING TYRE CARE SERIOUSLY

An important aspect of road safety regarding commercial vehicles is the regular maintenance and care of tyres. Overloading a vehicle or individual axles is a common cause of tyre failure. Drivers and repair shop staff are also required to check and set the air pres-

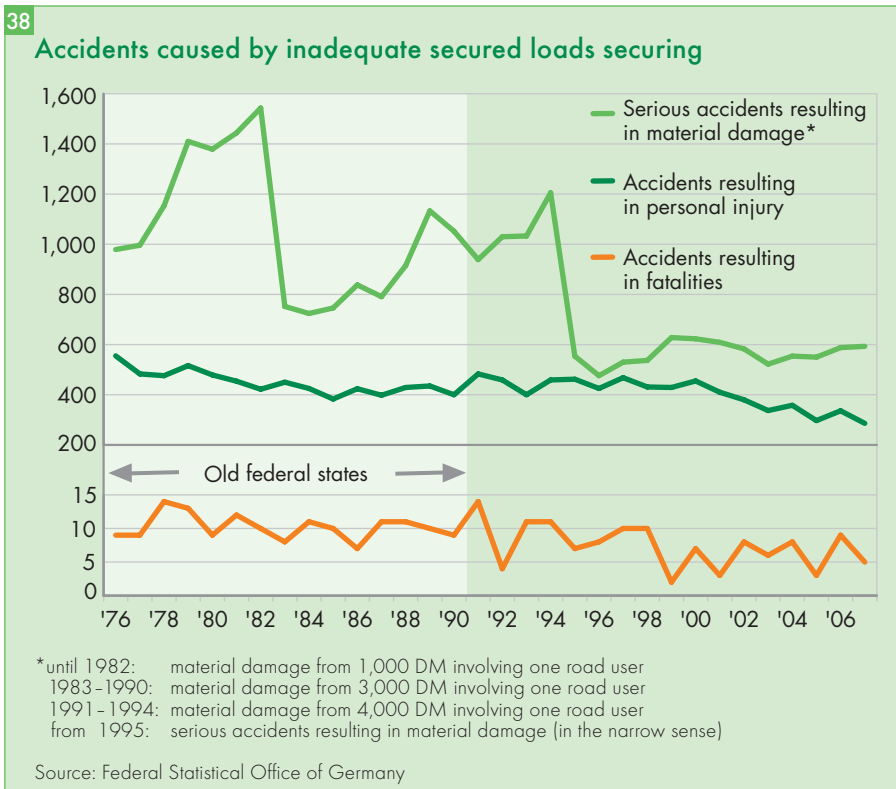
sure of all tyres regularly and to check the treads for early signs of damage. Flat tyres on trucks, unlike on passenger cars, seldom lead to skidding movements and accidents, as the still intact tyres can generally guarantee the driving stability of the commercial vehicle. However, following road users in particular are put at risk as a result of large parts and remnants of tyres having come loose and lying on the carriageway with possible material damage and personal injury as possible consequences.

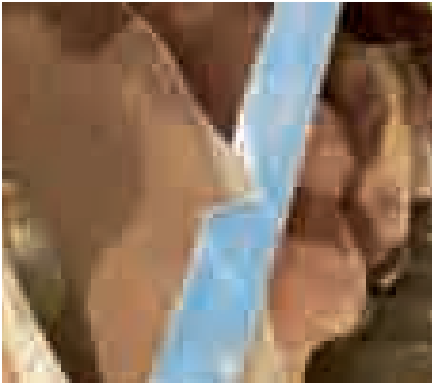
The statistical assessment of tyre defects by DEKRA Automobil GmbH has shown for decades that maintenance defects in particular, i.e. reduced air pressure or operation in overload, may be responsible for damage to tyres. Approximately 50 per cent of tyre failures can be attributed to this. Even where the cause cannot be clearly determined, reduced air pressure is involved in a high proportion of cases. "Cannot be clearly determined" means that, in these cases, several overlapping factors have led to the tyre failure. However, by using an automatic tyre pressure-monitoring system the danger of low pressure could be avoided.

Manufacturing defects represent a not insignificant proportion of the causes of accidents. However, this includes the increased share of remoulded tyres. Carcasses of tyres that have been used many times with the dimension 315/80 R 22.5 are in short supply on the remoulded tyre market. This means that carcasses of this size are sometimes used for remoulding although they are in fact no longer suitable. In some cases, the tyres have such serious existing defects that it is no longer possible to repair them properly. Although tyres occasionally have 10 to 20 serious belt injuries, because they are in such short supply, they are nonetheless remoulded.

The problem lies in the fact that pre-existing damage in the tread area in particular means that moisture can penetrate as far as the steel belt causing it to corrode. This reduces the adhesion between the steel chord and the rubber below the surface of the tread to such an extent that the protector suddenly detaches from the tyre carcass together with parts of the belt. In these cases the tyre may also burst.

Pre-existing damage caused by incorrect recutting of the profile is also rarely detected. This work is carried out at some hauliers by untrained personnel. A profile that is recut too deeply may also lead to the steel chord of the belt being exposed.





Many accidents are caused every year by poorly secured or unsecured loads.

PROBLEM LOAD SECURING

Hazards in goods vehicles also lurk under tarpaulins and on loading platforms. Countless accidents are caused every year by poorly secured or unsecured loads – many with serious consequences (Chart 38). According to official statistics, in 2007 in Germany “an inadequately secured load or vehicle accessories” was cited as the case of five accidents resulting in fatal injuries, 286 accidents resulting in personal injury and 593 accidents resulting in material damage. However, when interpreting these figures, consideration should be given to the problem of the estimated number of unreported or undetected cases and the bases on which statistics on the upper limit of material damage

are gathered, which have changed several times over the years.

However, an inadequately secured load is not only a matter of concern for road safety; accidents also frequently involve the truck drivers themselves and other persons going about their business in and on the truck. As load securing is also extremely important in terms of occupational safety, the Berufsgenossenschaft für Fahrzeughaltungen (statutory accident insurance body for transport, BGF) devoted itself to this issue very early on under the aspect of accident prevention. In 1980 it published the brochure entitled “Ladungssicherung auf Fahrzeugen” (Load Securing on Vehicles) – a manual for operators, schedulers, driving and loading personnel, which has become a standard work.

TRAINING FOR LOADERS, DRIVERS AND MANAGEMENT EXECUTIVES

Building on this, the level of load securing practised in the years to come in Germany will continue to improve. Several comprehensive manuals on load securing are currently available. With its publication of the “Praxisratgebers Ladungssicherung” (Guide to Load Securing) in 2007 and the Berufskraftfahrerinfo (professional driver information) in 2008 DEKRA contributed to ensuring that practitioners obtained an overview of the regulations of importance to them and were able to understand them and put them into practice. Through the symposium introduced in 1996 entitled “Ladungssicherung auf Straßenfahrzeugen”



In their seminars the experts from DEKRA also explain ...



... how to secure loads correctly.

(Load Securing on Road Vehicles) DEKRA also offers an international platform every two years on which experts can meet to discuss load securing on the basis of the latest findings and requirements.

In addition, in the context of special training programmes experienced trainers from DEKRA show loaders and drivers how to make their goods secure on the journey and deliver them

safely to the consignee and also how to avoid accidents. There are also training programmes for management executives. And not without reason. A look at the Straßenverkehrs-Zulassungs-Ordnung (Road Traffic Licensing Regulation) is enough to convince one of the special responsibilities of the vehicle owner. The Regulation states, in Section 31, paragraph 2: “The owner must not order or permit the operation [of the vehicle],

if he knows or should know that ... the vehicle, ..., the load or the passenger occupation is contrary to the regulations or that roadworthiness of the vehicle, the load or the passenger occupation suffers.”

And the accompanying operating regulation states: “If a vehicle or a load does not comply with the regulations inquiries shall always be made into whether the owner as well as the driver is at fault.” In accordance with Section 412 HGB (Handelsgesetzbuch or German Commercial Code) and a ruling handed down by the OLG (Oberlandesgericht or Higher Regional Court) the consignor or the loader, as the case may be, is also responsible for securing the load. Therefore both industry and business make the most of the information and services offered in relation to load securing.

The training provides, among other things, the physical bases of load securing and answers to such important questions as “What forces actually act on the load in the different traffic situations and for different types of use?” or “What are the principles of load securing and how do they operate?” The choice of vehicle is also addressed. Before loading takes place, it must be clear what type of vehicle is best suited for the transportation in question taking into consideration type, height of the centre of gravity, dimensions and the packaging of the goods. The different load securing materials are also dealt with in depth, in other words the operation and handling of, for example, lashing straps, shoring beams, nets, tarpaulins, airbags, anti-slip mats and wire ropes. In addition, it is explained to forwarders and hauliers, consignors and loaders as well as drivers what consequences any violations may entail under traffic regulations or criminal law.

HARMONISING EXISTING STANDARDS

The training programmes are based on, among other things, VDI Directive 2700 “Load Securing on Road Vehicles”. In October 1975 this milestone was issued for the first time by the VDI-Gesellschaft Fördertechnik Materialfluss Logistik (Society for Materials Handling, Materials Flow and Logistics Engineering) as a collaboration between experts from industry, freight transport, professional associations, the technical monitoring organisations as well as vehicle and body manufacturers. The Directive is not a piece of legislation, but it is recognised as an “objective expertise” and classified accordingly. It is currently valid in the

version of November 2004 and is regularly supplemented by follow-up sheets and adapted to the state of the art as an entire work.

Although VDI Directive 2700 is a Directive developed in Germany, it is available worldwide in an English translation. As a result, it was used by the Australian National Transport Commission between 1995 and 1996 as a basis for its "Load Restraint Guidelines". Germany also applies the DIN norms, which have been harmonised as the EN norms throughout Europe. The globally applicable ISO norms are of interest especially for globally operating manufacturers of vehicles and load securing equipment. Getting German experts to actively commit themselves in these international bodies is currently a major objective. That, in doing so, they can successfully contribute their practical experience and their knowledge of practical requirements is shown by the latest publication of EN 12642, which entered into force in January 2007. In this norm, demands placed on stronger body structures of vehicles are defined for the first time (Code XL), so that they can be involved in load securing more effectively than before. This working group, which was established in



With their roadside checks police and BAG check load securing and the technical condition of a vehicle.





The safety of the load is carefully scrutinised in roadside checks.



the Automotive Standards Committee of the Verband der Automobilindustrie (German Association of the Automotive Industry (VDA)), is chaired by DEKRA.

The certification of vehicle bodies and parts carried out by DEKRA in accordance with this and other standards is now the basis for load securing in road freight traffic. In consultation with customers from the transport industry, load-securing measures are developed that are both cost-effective and sensible and comply with the relevant regulations. The effectiveness of the load securing measures demonstrated in static and dynamic tests is documented by the DEKRA seal, which confirms proper load securing.

UNIFORM CONTROLS NECESSARY THROUGHOUT EUROPE

As these examples show, the European and global internationalisation of existing norms of load securing is currently a policy topic. The harmonisation of very different theoretical bases and physical models as well as their parameters for

calculating load-securing measures is necessary. This cannot be done without making compromises, but these must not be to the detriment of road safety and safety at work. The actual accident situation is, ultimately, what matters and, in this connection, European countries must be called upon to make the relevant official statistics available.

Germany and German hauliers are internationally recognised role models. However, you don't need to travel far in Europe to recognise that, in some countries, load securing can be improved still further. Transcontinental freight transport faces new challenges. No compromises can be made with regard to safety. In particular, competition must not be distorted through cost advantages gained as a result of load securing that is not done according to the rules or even not done at all. Reasonable checks at the roadside and at border crossings are therefore necessary. It is very important that these checks are carried out uniformly; otherwise there would be unnecessary uncertainty and loss of time, which would ultimately damage the acceptance of load securing in practice. The strategic aim must be to establish and implement uniform load securing in practice throughout the entire European economic zone.

ACCIDENT PREVENTION IN THE VEHICLE FLEET

Risk management should be at the very top of the agenda in every vehicle fleet. Targeted measures can prevent damage and significantly increase the safety and efficiency of a fleet. Every accident may ultimately endanger the health and even the life of a company's own employees as well as third parties and is also associated with particularly high consequential costs for the company, which are not covered by insurance. In the event of multiple losses or individual major losses, this can cost a pretty penny and may even have criminal consequences. In extreme cases a company's very existence may hang in the balance. What is more, every accident is detrimental to a company's image.

In this context, targeted measures that are exactly tailored to meet the needs and resolve the problems of the fleet concerned are extremely important. Very little is achieved with standard solutions and standard training. Initially, therefore, damage areas must be determined before improvement measures can be implemented in the form, possibly, of theoretical and practical driver training and driver safety training.

To be lastingly effective the measures must not be seen as temporary. Risk management is an ongoing process. Another crucial element is the active involvement of decision-makers in risk management. Management executives in particular must be made aware of the company's damage situation and set a good example. The driver is, ultimately, just a part of the overall structure of a vehicle fleet. Regular controlling is just as important for checking the effectiveness of the implemented measures.



Through driver safety training drivers also learn how to control their vehicles better in critical situations.



There is still the potential to improve the road safety of heavy goods vehicles.

Increasing the level of safety further still

Better equipping with driver assistance systems, financial incentives for their purchase, higher rate of seat belt use, better load securing, methodical ongoing training, high and comparable standards for main inspections and roadside controls across all borders: in order to improve the road traffic accident situation especially involving heavy goods vehicles there is still a need for action in many regards. The necessary measures must be implemented as quickly as possible throughout Europe at all political and economic levels.

A rapidly rising number of kilometres driven and increased transport capacity, rapidly falling numbers of serious accidents and therefore fewer fatally injured and seriously injured road users: this is the common denominator in the development of heavy goods vehicle use over the last few years. It is also a clear indication that the vehicle safety and road safety aspects of commercial vehicles have improved significantly. But there is more to it than that. Enhanced active safety elements such as electrodynamic vehicle control and turning assistance, distance-regulated ACC, electronic lane control have been integrated into vehicles. All commercial vehicle manufacturers have carried out a lot of development work in this area for many years and are keeping the various systems in readiness. However, until now these new safety systems have not been part of the standard equipment.

ASSISTANCE WITH THE PURCHASE OF DRIVER ASSISTANCE SYSTEMS

These safety systems are currently installed in only about five per cent of newly purchased commercial vehicles for several reasons, including because of the high upward pressure of costs in

the transport industry. It is therefore necessary to create stronger financial incentives. It is pleasing to note that this has now been acknowledged by politicians. From 2009 the Federal Ministry for Transport, Building and Urban Affairs will fund projects by road haulage companies, including in the area of safety, from receipts from the truck toll.

This is to be welcomed, especially since the development of electronic driver assistance systems is surging ahead. There will be new systems but, above all, the currently mostly independently working systems will be combined into an integrated concept.

The European Commission has also reacted to the importance of driver assistance systems for road safety and has issued a Directive, according to which newly developed commercial vehicle models must be equipped with ESP from 2011 in order to receive EU type approval. From 2012, newly developed trucks will also be equipped with an electronic emergency braking system and a lane assist system. Initial estimates have shown that, in the EU alone, approximately 2,500 lives will be saved every year. Active safety components such as ESP generally help drivers to control traffic situations better.

THE EFFECTIVENESS OF DRIVER ASSISTANCE SYSTEMS MUST BE DEMONSTRATED

If electronic driver assistance systems are prescribed by law it makes sense to define relevant minimum safety requirements that apply uniformly throughout Europe, as it cannot be ruled out that products will come onto the market that are competitively priced but may not have the desired effect. The definition of minimum requirement criteria should also be required if financial aid is provided for the purchase and fitting of driver assistance systems. Relevant legislation is therefore called for.

Not only trucks with their latest control and driver assistance systems can contribute to greater road safety but also passenger cars, which should also be equipped with the latest safety systems. Ultimately it is of no benefit to the occupants of passenger cars if a truck coming in the opposite direction is able to hold its lane through an assistance system but the passenger car is not.

If electronic driver assistance systems are integrated into vehicles they must be reliable over the entire lifetime of the vehicle. This is extremely important since the relevant components will be widely

checked at a European level during the regular main inspection. Germany is the first country in the world – including through the commitment of DEKRA – to have started to check electronic systems in heavy goods vehicles.

THE RATE OF SEAT BELT USE MUST BE HIGHER

Passive as well as active security also contributes significantly to road safety. This is particularly true of the seat belt. However, current traffic observations by DEKRA show that only about half of all drivers of trucks with a maximum permissible weight exceeding 7.5 tonnes use their seat belts on motorways. The rate of seat belt use on dual carriageways is even lower and, in built-up areas, only one in four drivers fasten their seat belt.

The sad fact is that many truck drivers suffer serious, even fatal, injuries as a result of accidents because they do not fasten their seat belts. Accident research has clearly demonstrated that injuries to truck drivers would be reduced or even prevented in up to 80 per cent of all serious accidents if drivers fastened their seat belts. Bearing in mind that a truck is also the driver's workplace, the benefit provided by a seat belt is very important.

Against this background, the "Hat's geklickt?" campaign, which was introduced in 2002 under the leadership of the Deutscher Verkehrssicherheitsrat (German Transport Safety Council) and supported by DEKRA is all the more important. The aim of the ongoing campaign is to raise the awareness of drivers of the dangers of not wearing a seat belt through different main campaigns.

PROFESSIONAL TRAINING TO IMPROVE THE SKILLS OF PROFESSIONAL TRUCK DRIVERS

Under Directive 2003/59/EC from 10 September 2009, as well as having the relevant driving licence, truck drivers will have to demonstrate special activity-related skills and knowledge through basic training (for new entrants) and also through regular further training. The purpose of the Directive is to ensure that the training of professional drivers is uniformly regulated in all EU Member States as well-trained drivers means fewer accidents. The most important safety factor in road traffic is and will remain the human being. Therefore, establishments such as DEKRA Akademie purport to be competent partners for driver training.

DEKRA also makes a major contribution to increasing load security, for example in the form of the publication of the "Praxisratgebers Ladungssicherung" (Guide to Load Securing), giving practitioners an overview of the regulations of importance to them. DEKRA Akademie also offers training programmes at regular intervals for loaders, drivers and management executives. In addition, for more than a decade DEKRA has organised international symposiums on load securing. The strategic objective for the future must be to achieve uniform load securing throughout the entire European economic zone.

RISK MANAGEMENT AND BONUS-MALUS REGULATIONS

Keyword – Human Being: Through damage prevention in the vehicle fleet the transport industry itself can do still more to improve safety on Europe's roads. The damage situation in the company concerned should be regularly scrutinised and analysed so that measures to reduce risk that are specific to the company's needs can be implemented. In addition to theoretical and practical training programmes and the continuous controlling of the measures implemented the "bonus-malus" systems may be worth considering as a way of providing incentives to encourage the careful handling of vehicles. Ultimately, every accident puts the life of employees and third parties at risk and every accident gives rise to considerable costs for a company, especially costs of damage that are not covered by insurance – not to mention the harm it does to the company's image.

INTELLIGENT ROADS ALSO INCREASE ROAD SAFETY

Road safety can also be increased by intelligent roads. Especially on highly congested motorways serious accidents occur again and again because of tailbacks. If, with an even greater differential speed to the preceding vehicle, a rear-end collision between a truck and a truck, a passenger car and a truck or even a truck and a passenger car usually leads to road users being seriously injured or even fatally injured. The temporary release of the hard shoulder can help by significantly improving the flow of traffic. The hard shoulder can also be used as an additional lane, especially for goods traffic, at peak times, thereby considerably defusing congestion and accident situations.



In Germany today, traffic on approximately 1,300 of the 12,400 kilometres of motorway is flexibly controlled by traffic management systems that respond to the relevant situation. It is known that the federal government intends to continue its activities to modernise traffic control in the future. Both the federal and state governments have approximately 40 million euros per annum at their disposal for this. DEKRA is calling for these funds to be increased in connection with current incentive measures for overcoming the financial crisis. Equipping major roads in Europe with more traffic management systems is a clear objective.

SINGLE ACCIDENT DATABASE AS A BASIS

The foregoing examples show that there is still unused optimisation potential when it comes to vehicle and road safety involving trucks weighing in excess of 12 tonnes. DEKRA is therefore calling on national and European politicians and on the transport industry to contribute, within the limit of their abilities, to greater safety on Europe's roads. The aim must be to reduce even further the number of accidents causing personal injury and material damage within the meaning of the European Road Safety Charter, which has pledged to reduce the number of traffic fatalities to 25,000 by 2010. This goal can be achieved through decisive and consistent action.

Detailed international statistics on accidents involving trucks are crucial in this connection. The current state can only be described as woeful. A harmonised European accident database, in which the trucks concerned can be clearly distinguished from other vehicles, is very important for two reasons: first, because politicians can only create the relevant framework conditions on the basis of accurate accident figures and, second, because manufacturers will then be able to better assess the benefits of new developments.

Any questions?

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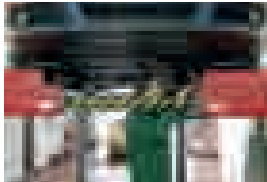
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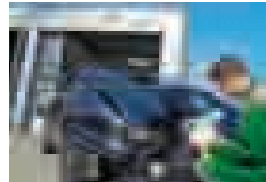
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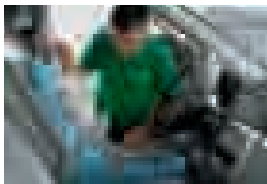
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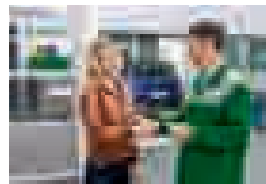
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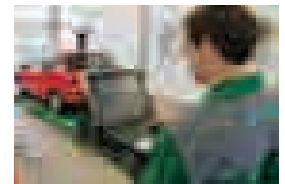
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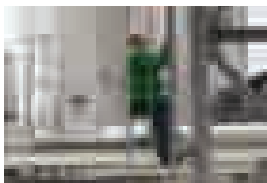


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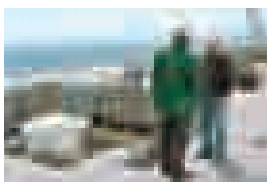
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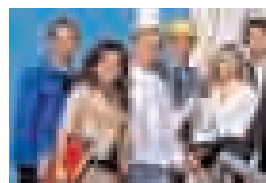


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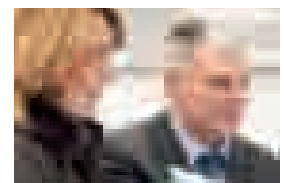
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