Commercial vehicles – efficient, flexible, future-proof
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Commercial vehicles – efficient, flexible, future-proof

Commercial vehicles are essential for the supply of our daily needs. They are the only viable means of transport for the economical transportation of even small quantities over relatively short distances and are flexible enough to supply goods to the warehouse or to the front door. Their designs are adaptable and can be customised to suit any conceivable transport requirement. They range from heavy duty vehicles, vans for smaller distribution tasks, disposal vehicles, dump trucks for the construction industry, trademen’s vans through to ambulance vans, school buses, fire engines and removal vans.

But they are not just designed and optimised with the individual transport task in mind. For the manufacturers it is at least as important to comply with the ecological and safety expectations of the future. Commercial vehicles have been able to improve their performance in these areas in recent years like no other. On introduction of the Euro-VI standard, their emissions of pollutants will be reduced by up to 97 per cent compared to 1990, thereby returning them to an almost “homeopathic” level. This is why engineers see their job in the coming years to be primarily the continuous reduction in CO₂ emissions.

Hybrid technology and electric motors will become increasingly important for light and medium-weight vehicles and buses, especially in towns and cities. As far as heavy duty commercial vehicles are concerned, reduction potential is to be found in aerodynamic optimisation alongside numerous other approaches.

The success achieved in safety is also impressive. Nowadays, commercial vehicles are just as safe as passenger cars in relation to the kilometres travelled. The increasing penetration of the fleet with innovative driver assistance systems such as brake assistant, lane departure warning systems and electronic stability control will help to further improve safety on the roads.

Despite all this, as efficient, flexible and future-proof as the commercial vehicle may be, it does not claim the entire area of goods transportation for itself – and it simply could not do so. Transports with high volume and great distances to cover can be far better taken care of by rail and inland shipping. Conversely, for smaller freight volumes and shorter distances, commercial vehicles take the lead in economic and ecological respects. So it is all the more important for the interaction between the different transport modes to be optimised and the efficiency of intermodel transport chains increased.

Irrespective of this, commercial vehicles will in future account for the greatest share of over 70 per cent of freight transport services in the estimate of all transport experts. Therefore, transport policy should beware of making road goods transportation increasingly expensive because the burden is ultimately borne by the consumer. Any such transport policy would be neither efficient nor future-proof.

Matthias Wissmann
President, German Association of the Automotive Industry
Commercial vehicles: efficient, flexible, future-proof

Commercial vehicles are the epitome of efficiency, flexibility and future orientation.

- They are efficient because they are able to economically transport even small volumes of only a few tonnes, as is usual for the path to the consumer.

- They are flexible because they are able to drive to virtually any location, stopping in front of every front door and every loading ramp and delivering the goods without complicated transhipment mechanisms. They are also flexible because they can be “tailor made” to suit all conceivable transport jobs. The adaptability of commercial vehicles to transport demands knows no boundaries.

- They are future-proof because work is already in progress today to adapt them to the demands and requirements of tomorrow - to the needs of their customers and users and above all to the needs of our environment for which they endeavour to become even more economical and cleaner.

Given all this versatility, it is no wonder that commercial vehicles shoulder the majority of freight transport, accounting for 72% of the entire freight transport performance in Germany.

...and good for employment

What is more, commercial vehicles are also an important employment engine. This applies precisely to Germany as one of the 10 leading commercial vehicle producers in the world. Some 210,000 jobs are provided in production alone, corresponding to over one quarter of all jobs in the automotive industry. Then there are those whose jobs depend indirectly on commercial vehicles, in their operation, maintenance and use, accounting for around 2.5 million people in Germany alone.
Commercial vehicles: partners to rail

Road and rail need each other

In every good partnership both sides complement each other with their respective strengths and weaknesses. This is also the case with road and rail. Commercial vehicles are able to economically transport small consignments of only a few tonnes over short distances. Above all, they can reach every front door and every loading ramp. But rail is better for very large transport volumes over longer distances – especially so if sender and recipient have a rail connection. This is the exception, however, so that commercial vehicles are usually indispensable upstream and downstream of rail transportation.

However, in all those cases where there are no railway sidings, the economic efficiency of rail starts to diminish because compared to transportation using road only, extra road transport arrangements need to be made upstream and downstream of rail, including transhipment operations. Logistics experts estimate that the economic efficiency threshold for rail on average is around 300 kilometres overall distance (sender to recipient). If the distance is shorter, it is frequently not worth using rail at all and the goods are transported exclusively by road. This is the case for virtually the entire domestic transport volume which after all accounts for some 78% of the freight volume in Germany.

Economic efficiency of commercial vehicles, railway and shipping

- Economic efficiency for short and small transports
- Reachability

+ \hspace{2cm} -

- Mass volume performance

Source: VDA
Cooperation through a division of labour

So road and rail are not real competitors in the truest sense. Rather, they cooperate in that every transport mode leaves those tasks to the other for which it is best equipped.

Rail needs commercial vehicles

In addition, commercial vehicles transport over 160 million tonnes of goods every year to the next rail connection for combined road-rail transportation.

Commercial vehicles need rail

Not least, millions of cars are transported by rail every year: virtually half of the new vehicles produced in Germany, including many commercial vehicles, are transported the greatest distance by rail.

Per capita goods volume according to transport modes in kilograms (per annum)

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<tr>
<th>Transport Mode</th>
<th>Per Capita Goods Volume (kg/annum)</th>
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<tr>
<td>Truck</td>
<td>100.3</td>
</tr>
<tr>
<td>Rail</td>
<td>10.2</td>
</tr>
<tr>
<td>Internal waterways</td>
<td>8.0</td>
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Source: ProgTrans AG, internal calculations
The commercial vehicle is like the good spirit in a large house. It takes care of any work and tasks that need to be accomplished in the background. It cleans the paths, takes the children to school, brings in food and other consumer goods. But the appreciation from the members of the household is modest and they are happy for it to stay out of sight. The main reason for this is usually that people view these services as a matter of course and are completely unaware of the work involved. This is reason enough to present a small selection of the range of work the commercial vehicle does:

• Every year commercial vehicles make some 8.3 rescue and ambulance trips
• Every year fire engines extinguish around 200,000 fires
• Every year commercial engines are involved in some 4 million home moves
• Every day commercial vehicles deliver over 70 million letters
• Every year commercial vehicles take care of some 2 billion courier, express and package deliveries
• Every year commercial vehicles dispose of 37.6 million tonnes of household waste
• Every year commercial vehicles deliver 492 litres of mineral water, lemonades and juices per household
• Every year commercial vehicles deliver 114 litres of beer per household
• Every year commercial vehicles bring 8.8 kilograms of coffee to the supermarket per household
• Every year commercial vehicles deliver over 60 kilograms of potatoes per household to the shops
• Every year commercial vehicles deliver 35 kilograms of apples to the shops per household
• Every year commercial vehicles deliver over 32 kilograms of meat per household to the consumer
• Every year commercial vehicles supply 110 litres of milk per household
Safe and assured for everyone

Commercial vehicles bear a very special responsibility for traffic safety. They move up to 40 tonnes on the road and, with an average of 80,000 kilometres per year, they travel more than six times as far as passenger vehicles. This is why they must be very safe. The manufacturers are aware of this responsibility and are permanently working on further improving the safety equipment.

A good achievement

Nowadays, commercial vehicles are just as safe as cars. For every 1 million kilometres travelled, trucks are involved in 0.44 accidents involving injuries to humans. With the same kilometres travelled, cars are involved in 0.46 accidents with human injuries.

In particular it has been possible to distinctly reduce the number of persons killed and seriously injured since the start of the decade, namely by 42% and 34% respectively. And this trend of decreasing accident figures will also continue into the future because our manufacturers already have numerous safety innovations which are more and more in demand by the transport companies.
What the manufacturers already have on offer today

The following are available even today…

• Brake assistants which recognise the intention to brake in full and maximise the braking force in seconds.

• Adaptive cruise control (ACC) which recognises slower vehicles in front and automatically brakes the commercial vehicle until the distance selected by the driver has been reached again.

• Emergency brake assistants which make an automatic emergency brake operation in the case of an impending collision with an obstacle if the driver does not react to acoustic and visual warning fast enough.

• Lane departure assistants which give the driver an acoustic signal if he strays from the lane.

• Lane change assistants that acoustically warn the driver of vehicles in the blind spot when he intends to change lanes.

• Electronic stability control (ESC) which is able to prevent skidding by selective braking of individual wheels.

• Cameras that help to avoid accidents when reversing by observing the area behind the vehicle

• New mirror systems that reduce the blind spot to a minimum to avoid accidents when turning a corner.

The manufacturers have correctly concentrated on the development of those innovations that help to avoid those accidents occurring most frequently with heavy-duty commercial vehicles. These are rear-end collision accidents (33%) as well as lane accidents and accidents caused by departing from the lane (39%).

Persons killed in accidents with truck involvement

[Graph showing decrease in persons killed with truck involvement over years]

Persons seriously injured in accidents with truck involvement

[Graph showing decrease in seriously injured persons with truck involvement over years]
Adaptive cruise controls help against rear-end collision accidents, for example. According to a study conducted by the Allianz Technology Centre on serious accidents with commercial vehicles, 70% of all truck rear-end collision accidents on motorways could be avoided if all trucks were equipped with the adaptive cruise controls.

Electronic stability control and lane change assistants help to avoid skidding and dangerous lane changes.

If combined with each other these three innovations reduce the number of truck accidents of this type (rear-end collisions and lane change/skidding) by 50%. In the case of an accident the damage sums are also 90% lower.

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**Truck accidents on all interurban roads through rear-end collisions, lane change and departure from the lane with and without safety package (emergency brake assistant, lane assistant, stability control) (per year)**

Source: Daimler AG

**Number of persons injured daily when turning left and reduction potential through left turn traffic lights**

Source: UDV
Equipment offensive coming soon

This is being taken into consideration by politics. According to the EU Safety Regulation of 2009, as from 1 November 2015 all new medium-weight to heavy-duty commercial vehicles must be equipped with an emergency brake assistant, a lane control system and an electronic stability program (the latter starting from 1 November 2014). Accident experts estimate that this will rescue 2,500 lives per year in Europe.

Manufacturer’s innovation work continues

A 50% reduction in the most frequent truck accidents is good, but not good enough for the manufacturers. They are therefore already working on further systems today which will make commercial vehicles even safer in the future.

In the medium term further applications will be available such as

- Bend warning assistants, which in combination with the navigation system can analyse the narrowness of the next bend and warn of an excessively high speed into the bend.
- Night vision systems which extremely improve vision by night using infrared.
- Active lane departure systems which do not just warn but carefully intervene in steering if the vehicle unintentionally departs from the lane.
- Parking and shunting systems that read out the distances to obstacles by ultrasound sensors at the front and rear.

All-round protection…

Source: Daimler AG
For long-term use work is being conducted on automatic lane departure control, lane change and parking assistants. It should nevertheless be mentioned that these assistance systems are in a position to support the driver but they cannot and should not relieve him of his responsibility. They are essentially aimed at avoiding the most frequently occurring driving errors.

If an accident happens despite all precautions, passive safety devices ensure that the damaging consequences of the accident are minimised. For this purpose, the commercial vehicle manufacturers have crash-optimised the driver cabins with special protection against rolling over, rear-end collision accidents and impact from loads slipping forward. Partner protection is also important for the manufacturers, for example, by the standard feature of a front guard that prevents a passenger car from slipping beneath the vehicles if there is a frontal collision.

The infrastructure is also a safety factor

The third element in the triangle of responsibility for commercial vehicle safety is the public sector. It makes a very substantial contribution to avoiding accidents with commercial vehicles by providing infrastructure.

One problem continues to be the lack of a sufficient number of truck parking spaces along motorways. This makes it difficult for the truck drivers to observe driving and rest times with all the negative consequences for traffic safety.

A good idea would also be the greater use of left turn traffic lights at junctions. 18 people are injured every day through this manoeuvre. As traffic experts have discovered, some 80% of these accidents could be avoided if the junction had its own left turn traffic lights.

Truck rear-end collisions on motorways with and without ACC
(per year)

Source: VDA
For the environment - a clean performance

Now that the manufacturers have managed to reduce their emissions of pollutants from their commercial vehicles by up to 97% compared to 1990, the ecological challenge of the future is primarily to further reduce consumption and CO₂ emissions so that we are further able to relieve the burden on the environment. The competition of ideas has already started here.

These successes in reducing emissions were not to be had for free. The complex technology required intensive research from the commercial vehicle manufacturers and ultimately had to be purchased by technical changes to the vehicles (e.g. use of exhaust gas recycling and particle filters) which in their turn increase fuel consumption. The Technical University of Vienna has found out that a commercial vehicle would use 17 per cent less fuel if it did not have to satisfy the Euro V emission standard.

A renewed reduction in emissions will be achieved by the introduction of the limit value stage Euro VI which will be binding on all commercial vehicles by 31.12.2013 at the latest. The NOx emissions are to be reduced here in particular so that a 97 percent reduction will be achieved compared to 1990.

Compliance with the emission standard leads to greater consumption

40t trucks in litres per 100 kilometres

Source: IVK, Technical University of Vienna
The pollutant emissions of commercial vehicles therefore drop to a “homeopathic” level that can hardly be reduced any further from a physical and primarily economic point of view. This is why in future manufacturers will be concentrating on reducing the fuel consumption and CO$_2$ emissions.

Great successes have been achieved here too. A 40-tonne truck nowadays consumes some one third less of fuel than its predecessor at the end of the sixties despite the minimisation of the pollutant emissions and improved safety equipment.

Reduction of exhaust gas emissions of heavy-duty trucks

Source: VDA
Commercial vehicles are sometimes more environmentally friendly than rail

But modern commercial vehicles are not just more environmentally friendly when compared to their predecessor models. They also need not shy from the comparison with other transport modes. Away from the prejudices that are quick to be made, it is emerging that no means of transport is the most environmentally friendly. The climate balance of a means of transport will depend very strongly on the respective framework traffic conditions in individual cases. The most recent investigations of environmental experts show that rail tends to offer environmental advantages, for example, in heavy bulk goods and container transport as long as the train is sufficiently long, the empty carriage percentage low and the upstream and downstream distance sufficiently short. However, as soon as the conditions are not ideal for at least one of the factors, the balance can quickly move in favour of the commercial vehicles. It can be shown, for example, that when transporting gear parts from Stuttgart to Rastatt the commercial vehicle is more environmentally friendly if the train consists of only 6 carriages for logistic reasons despite the extremely short prerun.

Greenhouse gas emissions for selected transports

![Comparison of the greenhouse gas emissions in the transportation of heavy goods in factory traffic from Stuttgart to Bremen. For the train the main run is shown in blue and the prerun in yellow.](image)

Transport case 1: transport of engines and gear parts from Stuttgart to Bremen

The following assumptions were made for the calculation:

- General assumption:
  - no consideration of empty trips

- Transport-mode-specific assumptions:
  - Truck: 30 l/100 km (in the case of full load, average value for this study)
  - Distance 633 km; load capacity utilisation: 84% with respect to the maximum effective freight load (semi-trailer)

- Rail: entire train (20 carriages); distance 628 km; swap trailers which are each filled with approximately 10.5 t load (92% with respect to the maximum effective freight load).

Transport case 2: transport of engines and gear parts from Stuttgart to Bremen

The following assumptions were made for the calculation:

- General assumptions:
  - 220 t, just-in-sequence delivery (twice per working day)
  - no consideration of empty trips

- Transport-mode-specific assumptions:
  - Truck: fuel consumption: 2 cases:
    - a) 30 l/100 km (in the case of full load, average value for this study)
    - b) 36 l/100 km (real consumption for the route travelled and actual load, demanding route profile)
  - Distance 115 km; load capacity utilisation: 79% (semi-trailer)
  - Rail: distance 108 km; load capacity utilisation 73% (40 ft containers); 6 carriages; prerun to rail transport: 2 km truck

Source: PE International
End of consumption reduction not yet in sight

And for the future even further improvements in the environmental performance of commercial vehicles are to be expected. It is the declared objective of the project entitled “Energy-efficient Trucks” conducted by the Research Association for Automotive Technology (FAT) to increase this potential. The project currently investigates which bundle of vehicle-related and also logistic and traffic flow optimising measures are required to achieve a further reduction in consumption.

Attention is being given amongst other things to improving the vehicle dynamics because almost 40% of the entire energy expenditure must be used to move a 40-tonne truck along a level road with a constant speed of 85 km/h to overcome the air resistance.

“Green telematics” will help drivers

There is also potential in the use of telematics applications which help to reduce fuel consumption. This also includes automatic vehicle reports which document the driving, braking and consumption behaviour of the vehicles in order to suggest technical measures during the next service. For example, they point out low tyre air pressure which can increase fuel consumption by up to eight per cent. The individual driving style of the driver can also be analysed to help him practice a driving style that is as ecological as possible.
Therefore, all environmental experts are agreed that the fuel and CO₂ efficiency for road freight transportation will distinctly increase in the coming years. The use of innovative commercial vehicle concepts alone and a 20% admixture quota for biofuels of the second generation will reduce the CO₂ output of road freight transport for lightweight goods by 20%.

Quietly does it

But commercial vehicles have not just become cleaner and more economical. They have also become distinctly quieter over recent years. Thanks to the permanent further development of engine technology and the almost complete encapsulation of engines nowadays, 13 trucks are no louder today than one truck in 1980.
External costs: EU concept has no viable foundation

The EU Commission also wishes to impose the environmental costs of trucks on them by way of the road toll. It is overlooked here that the negative environmental effects of trucks are declining and that nowadays trucks make a contribution to covering the remaining environmental expenses via taxes.

Environmental costs essentially covered even today

Road freight transport is often reproached for not bearing the costs of its environmental burden and must therefore be made more expensive. However, this discussion is not always conducted in an honest and objective manner. Enhanced income for the public sector is expected from making road freight traffic more expensive along with a shift of market shares to other transport modes. Both are unjustified. Thinking in market shares and competition between traffic modes should be a thing of the past and make way for the understanding that a successful traffic system can only function as a cooperative interaction of all modes of transport.

In addition, road freight transport covers its infrastructure costs by far so that even today the arithmetical surplus can be used to cover any possible external costs. As the DIW calculated in a detailed analysis in 2009, the degree of coverage of trucks liable to pay tolls on the federal motorways is 152% for foreign vehicles and even 208% for domestic vehicles.

Income from vehicle-specific taxes and charges and road costs of trucks liable to pay tolls on federal motorways (in € million per annum)

Quelle: Source: DIW
Both vehicle groups together pay over €3.2 billion more than the road costs they cause. Economists point out time and again that when quantifying the so-called „external costs” the door is wide open to arbitrariness. Despite all this, in June 2008 the EU Commission submitted a proposal to attribute air pollution and noise costs to road freight transport, but left rail transport out of the equation. In addition road freight transport is also to pay for the costs of its traffic jams. The new federal government now correctly wishes to request the EU Commission to submit a new proposal for the allocation of external costs which incorporates all transport modes to an equal extent and foregoes allocating the costs of congestion.

Development of road travel shares of trucks subject to tolls

Source: Federal Agency for Freight Transport
Experience shows that reward is better than punishment

The past has shown that transport companies modernise their commercial vehicle fleet quickly also without “penalty payments”. Since 1 January 2005 the classification of the truck toll according to pollutant classes and the innovation programme have led to the share of toll kilometres travelled by Euro V vehicles rising since 2006 from 5.6% to around half today.
Innovative commercial vehicle concepts – ideas in the service of the environment

An intelligent transport and environmental policy should also make use of new ideas instead of making things more expensive. The environment will then also benefit from this approach.

Making transport more expensive to relieve the environment is the wrong strategy. Investment subsidies for low emission commercial vehicles and ecologically graded tolls and not least the use of innovative commercial vehicles concepts have a far better effect. These are far better attuned to today’s logistic requirements of industry than traditional concepts and can therefore offer transport services with far fewer trips and emissions.

Unfortunately, the German transport policy has always found it difficult to even examine concepts of this nature. By contrast, in other European countries, such as in the far more densely populated Netherlands, these concepts have long been used with great success and belong to the everyday picture.

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Environmental relief through innovative commercial vehicle concepts in Germany
in millions of tonnes/year

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<th>without innovative commercial vehicles</th>
<th>with innovative commercial vehicles</th>
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<tr>
<td>PM</td>
<td>6.9</td>
<td>0.6</td>
</tr>
<tr>
<td>NO\textsubscript{\text{\textalpha}}</td>
<td>4.7</td>
<td>1.7</td>
</tr>
<tr>
<td>CO\textsubscript{\text{\textalpha}}</td>
<td>21.6</td>
<td>14.7</td>
</tr>
<tr>
<td>Consumption</td>
<td>110.6</td>
<td>75.36</td>
</tr>
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</table>

Source: EU Commission
Using 25.25 m long vehicle combinations which would arise from bringing together the transport modules used today, three conventional truck combinations can be merged into two combinations so as to transport the same volume of goods with distinctly fewer emissions and less road use. For Germany, the EU Commission expects an annual saving of 2.2 million tonnes of fuel and some 7 million tonnes of CO₂ if innovative commercial vehicle concepts are permitted in this country.

And not only the environment would benefit from this. Precisely for combined road-rail transport, the costs for the upstream and downstream road transport would be reduced. In many cases this would be the argument to convince hauliers to decide in favour of combined transport instead of purely road transport.

It was therefore with good reason that the federal government decided to examine the promise of innovative commercial vehicle concepts in Germany as part of a national field study.
Infrastructure may not be neglected

Ensuring a future-oriented transport system cannot be the sole task of commercial vehicle manufacturers. The most environmentally friendly technology is useless if its success is negated by inadequate infrastructure development and congestion.

Investments are a must!

Every year our commercial vehicles spend 180,000 hours in traffic jams and that is just on the motorways. Just how damaging this is to the environment becomes clear if it is considered that the current fuel consumption of a 40-tonne truck can triple even if it has to brake only twice over one kilometre instead of cruising through at 50 km/h.

Traffic jams may be attributed to the investment deficit in the construction of the federal highways over the years. Whilst infrastructure experts assume an annual investment requirement of 7 billion euros, the actual investments total around 5 billion euros and will only be noticeably above this figure in 2009 and 2010 thanks to the additional funds from the economy boost packages.

Distribution of the federal highway investments according to budgetary funds, toll and economy boost funds (in € million)

Source: VDA, Pro Mobilität
No increase in investments despite the truck toll

It is difficult to understand that the investments in federal highways have nevertheless not been increased despite the introduction of the truck toll and increasing the tolls in 2009. Rather, investments in the federal highways are threatening to be reduced to below the level before introduction of the tolls - despite the additional income generated from them. By constantly decreasing the investments financed by the budget and increasing the toll as of 1 January 2009 the income from the tolls will account for almost half of federal highway financing by 2011 according to current budgetary plans.

Whilst the federal government’s announcement that it wishes to examine a closed finance system for the roads with a complete allocation of income generated by tolls is to be welcomed, this may not be associated with a further reduction in budgetary funds. The infrastructure would ultimately not be helped by an approach of this nature.
Germany as a sustainable logistics location

Logistics continue to be one of the fastest growing economic sectors in the world. But they do not always meet with favourable framework conditions here, making it difficult to attract new logistics companies and inhibiting industrial growth as a whole. Further countermeasures are required here.

Strengthen logistics as a driver of growth

The logistics industry is the third largest industrial sector in Germany with an annual turnover of some € 200 billion and over 2.6 million direct jobs. Thanks to globalisation, it is one of the world’s fastest growing industries so that it is all the more important to ensure framework conditions in Germany that are conducive to logistics operations and to strengthening the industry.

Small difference with great effect

One disadvantage for Germany as an industrial and logistics location is the restriction of the vehicle height to 4 metres. Other countries such as France manage without any restrictions of this nature. The strict assertion of the 4.0 metre limit is contrary to an efficient transportation of the standardised meshed containers with a height of one metre in three layers usual in industrial logistics because with a restriction to the vehicle height to 4 metres, only a loading room height of less than 3 metres can be realised.

Only a few centimetres more permit three-layer transportation = > 50% more load factor

Source: VDA
Goods transport and logistics action plan – a good start

The new federal government intends to re-adjust the goods transport and logistics master plan submitted by the previous government – moving away from the old approach which was aimed at traffic avoidance and shifting, and making it more expensive. This re-adjustment of the plan toward a more demand-oriented and logistics-friendly approach could improve the conditions for international competitiveness of Germany as a logistics location.
Vans – suppliers to every last corner

Vans are the commercial vehicles for urban goods supply. They are not only able to reach end consumers directly; the requirements of road traffic also require that vans satisfy highest ecological standards. Today’s modern vans fully satisfy these demands.

In actual fact „the“ classic van does not exist. It is always customised to suit the specific function and is therefore available in a wide range of versions. For example, it comes as an ambulance van, school bus in rural areas, delivery van for lightweight material or for courier, express and package consignments or as a mobile tool store and service station for tradesmen – the versatility of “the” van knows no limits.

Vans “near to people” in the truest sense of the word

It is only thanks to the van that goods and mail can be delivered directly to our homes. It is the ultimate service provider and therefore always close to the people. Its proximity to people in urban traffic also calls for environmental compatibility at the highest level. Today’s modern vans satisfy this requirement in every respect.

With the limit value level of Euro V, the emissions have been reduced by between 96% and 98% since 1990. The future limit value level Euro V will lead once again to a distinct reduction in the NOx values.

Modern vans can then hardly be topped in matters of cleanliness. In future therefore efforts will be concentrated on further reducing the fuel consumption and CO2 output. The use of hybrid and electro motors are suitable precisely for vans because in the small volume urban distribution traffic with many stops, frequent trips and permanent charging facilities, the full potential of this mode can be fully exploited.

Today’s vans are already available on the market as start-stop hybrids. Their fuel and CO2 savings average 5% compared to conventional diesel engines. The use of hybrid vehicles can in future lead to up to 20% fuel savings in distribution traffic. First products for purely electrically driven vans are already on the market or in preparation and will then function completely without fossil fuels and will travel locally free from emissions.
Safety offensive of the manufacturers takes effect

In order to continuously improve the safety of vans, the manufacturers have brought the “Safetyplus Van” initiative into life together with partners which is intended to make the path to market easier via a certification of safety-related equipment of the vehicle systems of active and passive safety. As a result, the equipment level with servo-assisted steering, anti-blocking systems (ABS), traction control systems (TCS), electronic stability control (ESC) and brake assistants has constantly risen.

The manufacturers, together with other partners, have also initiated the joint research project “Safety of Vans” within the framework of which data on transport accidents are analysed to obtain further knowledge on the significance of safety features.

Speed limit for vans is justified neither by safety nor climate protection arguments

A speed limit for vans in Germany has frequently been discussed in the past because individual van accidents and their temporal concentration led temporarily to great public attention. Investigations initiated subsequently by the Federal Highway Research Agency in 2002 and 2006 have shown, however, that the risk of vans being involved in accidents is even lower than that of passenger cars and that vans do not encounter accidents in terms of the kilometres travelled any more frequently than other vehicle categories. It was also shown that the accident burden (accident involvement per 1,000 vehicles) continues to drop for vans on the whole. The national discussion of the speed limit for safety reasons has now ebbed.

However, the Draft Regulation submitted by the European Commission in autumn 2009 for a CO₂ regulation for lightweight commercial vehicles also recommends the installation of speed limiters. The argumentation of the Commission in this case is therefore not very convincing, stating that in the absence of special speed restrictions for vans, increasingly higher maximum speeds leads to a competitive advantage which in its turn could lead to overdimensioned engines with corresponding inefficiency and slower operating conditions. This can be answered with the argument that the maximum speed of N1 vehicles is not an element of competition in this segment. The market for vans is driven by cost that stops manufacturers using capacities and therefore also financial resources for increasing the maximum speeds of vans. This may be recognised not least by the fact that 70% of the lightweight commercial vehicles produced in Germany have an engine power of less than 100 kilowatt hours. In this respect therefore the demand for speed limiters in vans has no foundation whatsoever from the point of view of environmental protection.
Buses – partners to rail soon in scheduled long distance transport

Buses are unbeatable in terms of flexibility and efficiency. No other means of public transport can be used so widely and in such an environmentally friendly and economical manner for traveller and tax-payer alike.

In local transport …

the flexibility of the bus is demonstrated by the fact that it can still be deployed economically where rail transport is no longer worth it. For municipal transport, it can be designed such as to use the finest road network and bring people almost to their front doors. Walking from next bus stop home takes only 6 minutes on average whilst a traveller must walk over 27 minutes from the next railway station home. The bus is indispensable primarily in rural areas: depending on temporal distribution of demand, it can flexibly adjust its route and is economical into the bargain. Although it serves almost half of the local transport demand, it receives only one tenth of the public sector spending on local transport.

Buses are the backbone of local transport

Percentage share in traffic volume in local public transport in Germany

Source: VDV
In tourism …

Buses demonstrate their efficiency by the fact that they are almost always 100% full. Which other means of transport can claim this? After cars and planes, buses rank third in the most popular means of travel and have a share in the overall travel market of some 10 percent – and the trend is on the increase. By 2015 it is expected that buses will extend this market share to 12 per cent – not least due to the fact that it is an attractive choice for customers in the growth market of culture, educational and wellness trips.

In scheduled long distance travel …

Buses will also soon have the opportunity to fully exploit their possibilities. The federal government has decided to deregulate scheduled long distance travel for buses where today only very few routes are allowed. Although buses will be able to offer a seated kilometre which is probably 50% cheaper than the railway, the establishment of long distance bus transport will not be to its detriment because buses will deliberately aim at the price-sensitive customer segment and therefore attract people who would tend to take the opportunity of lifts in private cars or who would forego longer trips entirely due to the cost. Thanks to buses these people too can enjoy longer trips away. From this it may be seen that road and rail now also work hand in hand in the long distance transportation of people alongside goods transport and local transport.

CO₂ emissions of bus and rail

<table>
<thead>
<tr>
<th></th>
<th>Distance transport</th>
<th>Local transport</th>
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</thead>
<tbody>
<tr>
<td><strong>Bus</strong></td>
<td>32</td>
<td>75</td>
</tr>
<tr>
<td><strong>Rail</strong></td>
<td>52</td>
<td>95</td>
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Source: Federal Environment Agency
Efficient also for the environment …

Buses are not just efficient in terms of traffic and economy but also with respect to the environment. Per person kilometre they emit less CO₂ than all other means of transport and are therefore the consumption and climate efficiency winners in passenger transport. In urban traffic the use of hybrid buses can lead to consumption savings of up to 25%.

… and for safety

The performance of buses with respect to safety is equally impressive. Per 1 billion vehicle kilometres only an arithmetical 0.2 passengers are killed in traffic accidents involving buses. Since 2000 the number of persons killed with bus involvement has declined by almost half (47%).
“Green telematics” on the advance

Shippers and transport companies are correctly paying increasing attention to environmentally friendly „green“ logistics. A central instrument here is telematic applications for fuel economies which are available on the market today in a broad range of products. So far hauliers have been hesitant to acquire this new technology.

The avoidance of mileage is at least just as important for the environment as clean and economical engines. More and more manufacturers of commercial vehicle telematics have devoted themselves to this objective because the avoidance potential is even greater in goods transport than in passenger transport due to the possibility of coordinated control of entire corporate fleets and in view of the high kilometres travelled annually by commercial vehicles.
• For example, incoming transport orders can be transmitted from the central control stations directly to those trucks which are closest to the sender and which have free capacities. The new route is automatically fed into the on-board navigation system. This avoids unnecessary travel and empty trips.

• Dynamic navigation takes into consideration the current traffic situation and saves trucks from congestion and the environment from congestion-related emissions.

• Navigation that takes into consideration the special dimensions and weights of the commercial vehicles in selecting the ideal route prevents drivers driving into „cul-de-sacs“ with low bridges or roads with insufficient load-bearing capacity and finally needing to return to a suitable starting point.

• Automatic driving reports document the fuel consumption behaviour of the individual commercial vehicle and draw attention to technical defects that lead to greater consumption.

• Automatic reports document the braking and acceleration behaviour of individual drivers and support corporate driver training in this way for a fuel-saving driving style.

Environmental experts estimate that a corporate fleet can save at least 10% fuel consumption and CO₂ emissions in this way. This would mean a saving of some 3 litres over 100 kilometres for a 40-tonne truck. Extrapolated to all trucks and semi-trailers this would represent some 780,000 tonnes of CO₂ less being pumped into the environment.

Degree of equipment of medium-weight and heavy-duty commercial vehicles with "green" telematics in Europe expressed as a percentage

Source: Frost & Sullivan
Commercial vehicles: for the future and of the future

Our commercial vehicles are driving safely into the future. They are equipped to meet the challenges of tomorrow in terms of traffic safety, economic efficiency and environmental friendliness. Conversely, they are also contributing to securing all our futures because efficient goods transport is the basis for wealth, growth and employment.

Innovations for the traffic of tomorrow

All forecasts on goods transport assume that it will continue to grow in future - from today’s 573 billion tkm by more than 60% to 936 billion tkm in 2025. Little will alter in the current division of labour between the traffic modes. They will continue to assume those transports for which they are predestined in view of their technological system characteristics. Commercial vehicles will continue to form the backbone of our transport system fifteen years from now, assuming some 70% of the goods transportation in Germany. They therefore continue to be a decisive factor in the securing of our economic future.

Fears that the environmental burden will also grow are completely unjustified, however. On the contrary: in the past the commercial vehicle manufacturers have been faster to implement their ideas on emission avoidance than the growth in traffic so that despite growing transport volumes, the emissions of commercial vehicles have declined in absolute terms in almost all categories. If this success is placed in relationship to the transport performance, the innovative strength is even more impressive. Since 1995 the emissions per tonne kilometre have dropped by between 30% and 80%. And further reductions are expected by the environment experts.

Development of the commercial vehicle emissions per tonne kilometres

Source: TREMOD
Commercial vehicles of the future – streamlined, light-weight, telematics-assisted, electrically and bio-driven

The fact that the environmental successes will continue into the future is attributable to innovation endeavours which our manufacturers are investing today in the commercial vehicles of tomorrow.

Vehicles used in long distance and heavy duty transport could be more streamlined in future in order to reduce the air resistance. Under ideal conditions this may lead to up to 15% - 20% fuel savings. The chassis are also increasingly being made of lightweight aluminium and composites to realise further fuel savings. This will also be supported by the fact that in the longer term there will probably be a widespread use of „green telematics“.

In drive technology the diesel engine will continue to form the basis – particularly for heavy duty commercial vehicles and those deployed for long haul transport. However, diesel engines will become more environmentally friendly and in the long term almost climate-neutral firstly thanks to further improvements in the engine, auxiliary drive and powertrain technology. Engineers view there to be fuel saving potential of some 10% here. Secondly, however, due to the increasing use of biodiesel particularly as soon as biofuels of the second generation can be economically produced in large volume.

Light-weight and medium-weight commercial vehicles as well as buses, particularly in urban traffic, are frequently driven by gas even today. Their share in the future will increase. The hybrid and electro motors will become increasingly significant for these segments. A series-produced start-stop hybrid is already available today. Small series are in preparation for the purely electrically driven vehicle.

Our commercial vehicles are therefore very well equipped to meet the ecological challenges of the future.