DEKRA Automobil GmbH

ROAD SAFETY REPORT 2008

Strategies for preventing accidents on Europe's roads

DEKRA

The human factor: Young drivers and senior citizens are especially at risk

Vehicle inspection and accident analysis: Serious faults on older vehicles

Main risk factors: Alcohol, speed and not maintaining sufficient inter-vehicle distance

“The motor car is fully developed. What could possibly come next?”

Karl Benz, 1920

Perhaps you would prefer turning to a partner who thinks as far ahead as yourself.

Even when some people believe that the goal has been achieved – there is always something that can be improved upon. And this is the way we have always proceeded in our endeavours to make driving even safer: not only by means of statistical accident analyses, but also by conducting rigorous practical tests at our Crash Test Center in Neumünster. This is also the way we work together with our partners in the automotive industry to ensure that the production car is safe well before it is launched onto the market. And we verify its safety ourselves when the next main inspection comes round.

Automotive — Industrial — Personnel — International —

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DEKRA

DEKRA as a driving force for more safety on Europe's roads

Last year the number of road accident fatalities in the EU fell under the 40,000 mark for the first time. This figure means that the European Commission is edging that bit closer to achieving its declared objective set out in the EU Charter for Road Safety, namely to reduce the number of accident deaths per annum to 25,000 by 2010. The aim of the EU Charter, which DEKRA was one of the first to endorse, is doubtless an ambitious one. Yet, it is perfectly achievable if all participants pull together and the optimisation potential already available is systematically employed.

As Europe's largest technical organisation, DEKRA is also well aware of the responsibility it bears. The system of periodic vehicle monitoring, in the shaping of which we have played a major role over the past decades as the leading provider in Europe, means that DEKRA also plays an essential role in maintaining a high level of technical safety for vehicles on the roads. It is our commitment that has led to electronically-regulated safety systems and components now being included in the main inspection procedure in Germany. It is hoped that other EU countries will soon follow our lead in this area.

Today, DEKRA operates in 28 European countries; in the field of the technical monitoring of vehicles we are not only the pre-eminent provider in Germany, but also the market leader in France and the Czech Republic, too. Our experts are in demand and respected as competent authorities in national and international committees on road safety. This also applies to our accident analysts, who are regularly consulted to determine the causes of road accidents.

For years now, DEKRA has also been a long-standing advocate of heightening the safety awareness of young drivers in particular. This is because young people continue to be all too frequently involved in serious accidents. Inexperience, over-estimation of their personal capabilities and too little driving practice are among the main reasons for the disproportionate risk of accident in this group.

This is why, backed by the Federal Transport Minister Wolfgang Tiefensee, the nationwide road safety campaign known as the DEKRA SafetyCheck, will continue to run in 2008. This means that more than 14,000 young people could have their vehicles inspected for faults at one of our centres free of charge – not only in Germany, but also in other European states, which is yet another important contribution that DEKRA is making to ensure even more safety on our roads.

Dipl.-Kfm. Klaus Schmidt, Chairman of the Boards of Management of DEKRA e.V. and DEKRA AG.

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DEKRA ROAD SAFETY REPORT 2008

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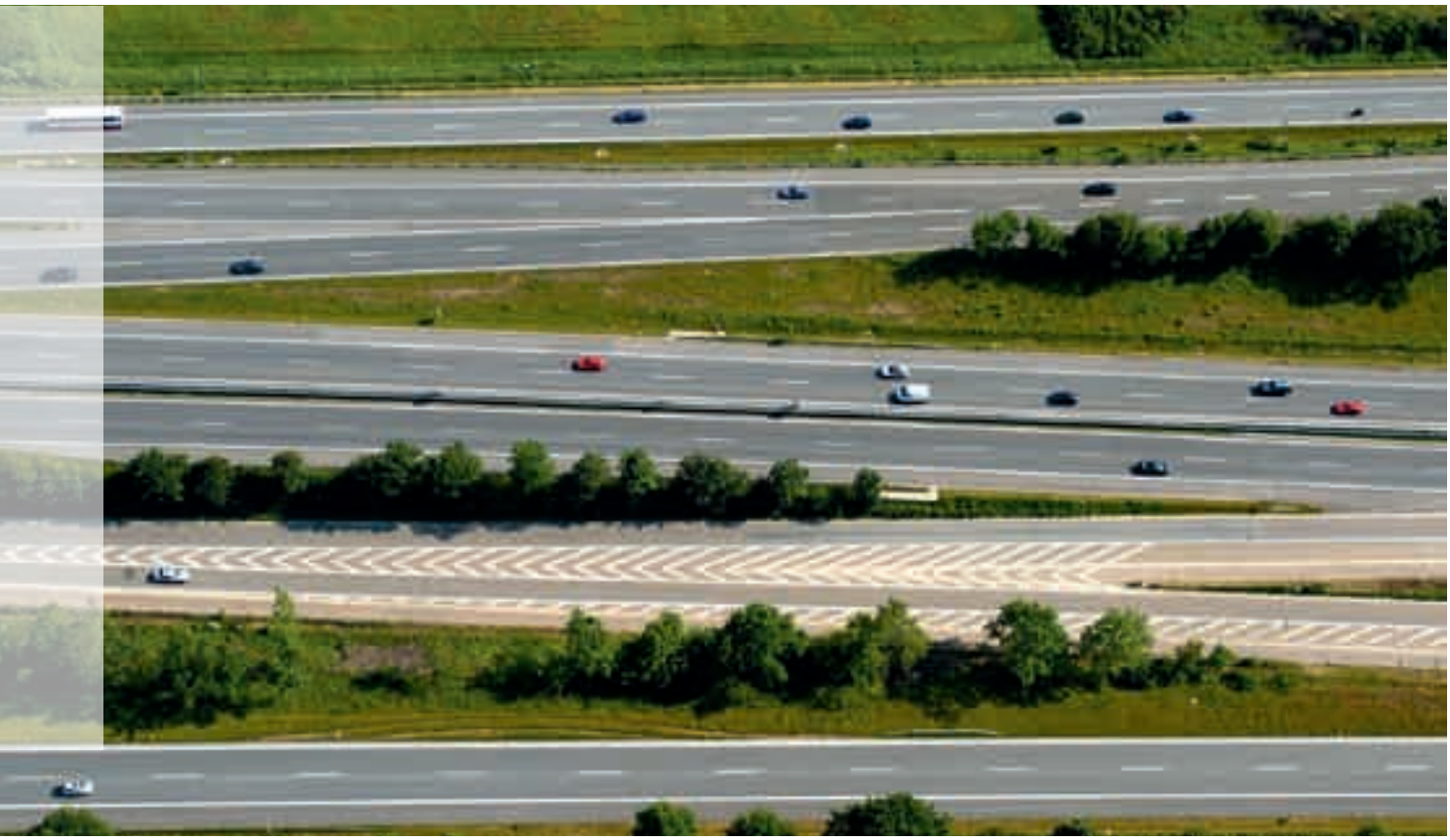


Advisor to politicians, transport experts and every motorist

Three years have now passed since our last report dealing with "Technical Safety on the Road" was published. The publication soon became a frequently consulted reference work in the sector, and at the same time it presented a host of arguments in favour of continuing our intensive endeavours to increase safety on Europe's roads.

In this respect, we have been able to witness some noticeable progress over the past three years. The number of road fatalities has fallen across Europe by more than 13 per cent. Nevertheless, every loss of life as a result of a road accident is one fatality too many. Consequently, there remains much to do in many areas. And this is what the DEKRA Road Safety Report 2008 aims to highlight by means of statistics and the evaluation of data prepared in Germany and selected European countries.

The report focuses firstly on the vehicles themselves – in particular on older cars in which the number and seriousness of technical faults rises considerably with increasing age. The experience of DEKRA experts has demonstrated time and again that inherently a car that is seven to nine years old is exposed to approximately three times as much potential risk as a newer vehicle up to three years old. Secondly, in this respect it is also important to look more closely at structural modifications.

However, it is not only the vehicle that plays a key role in road safety; the driver and his/her behaviour also make an essential contribution to the end result. Driving while under the influence of alcohol and drugs or driving too fast are just two of many aspects where psychological or medical considerations have a role to play in determining the causes of an accident. In view of the continuing discussion on driving licence restrictions for senior citizens on the one hand, and the issue of driving licences to 17-year-olds on the other, this report also devotes attention to the accident profile of young and elderly motorists.

However, the report is far more than a compilation of data or a snapshot of the technical safety of passenger cars on our roads. It is, rather, intended to present politicians, transport experts and, not least, every motorist with recommendations on how individual actions and statutory regulations can help further reduce the number of accidents involving fatalities and injured.

Dipl.-Ing. Clemens Klinke, Chairman of the Board of Management, DEKRA Automobil GmbH

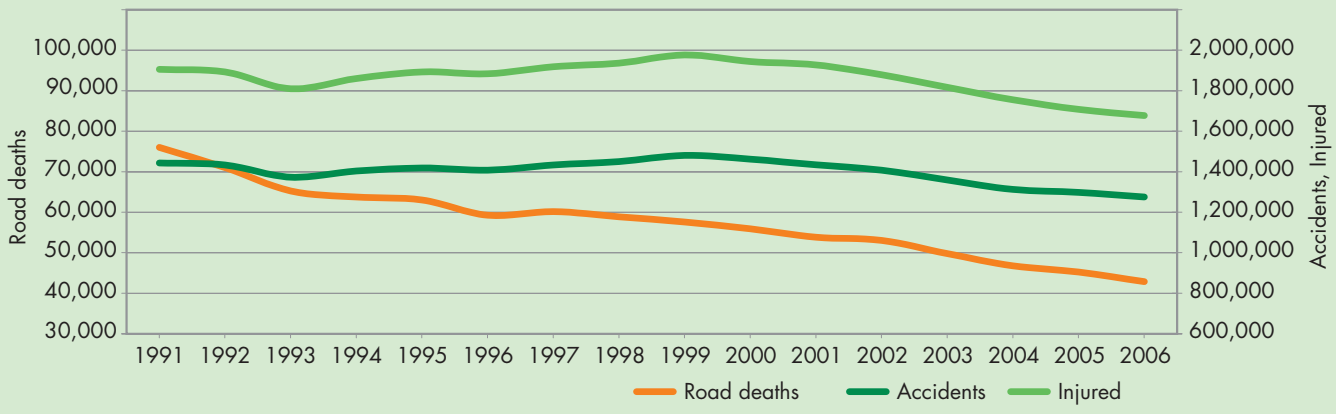
Heading towards even greater road safety

The trend couldn't be more positive: The number of road fatalities has fallen almost everywhere in Europe over the past few years. Moreover, it has done so even though the volume of traffic has increased dramatically – and continues to grow. However, we are a long way from fully exploiting all the potential means of preventing accidents.

The figures speak for themselves: In 1991, the number of road fatalities across Europe was still around 76,000; this figure fell below the 40,000 mark for the first time at the end of 2007. During the same period, the number of cars increased by over 40 per cent and the overall total mileage of passenger traffic also soared. This, taken together with the rapid growth in goods traffic that has been recorded for years now, results in a correspondingly high potential level of

ROAD SAFETY IN EUROPE

Changes in the number of road fatalities, accidents and injured (EU 27)



Source: CARE (EU road accidents database) or national publications, European Commission/Directorate General Energy and Transport, December 2007

accident risk. The fact that the number of road deaths is nevertheless falling has a lot to do with the intensive endeavours undertaken in improving road safety. In this context, the enhanced vehicle technology that incorporates efficient active and passive safety measures is just as important as, for example, modern road construction or the mandatory requirement in virtually all European states to wear a seat belt. However, the systematic technical monitoring of the vehicles on the road is also a decisive factor in enhancing road safety and this has been a core competence at DEKRA, the largest technical organisation in Europe since its establishment.

SLUGGISH DECLINE

Despite the progress achieved, the European Transport Safety Council in Brussels recently made it abundantly clear that we have no cause to relax our efforts. This is because in order to achieve the ambitious target set by the EU Charter – halving the annual number of road fatalities to 25,000 by 2010 – an average fall of 7.4 per cent every year would be required. It must be admitted that in most European countries the fall in the number of road fatalities in the past few years has tailed off. Let's take Germany for example. According to the Federal Statistics Office, the figures fell by eight per cent in 2005, by five per cent in 2006, and only 2.4 per cent in 2007. The greatest success in reducing the number of fatal accidents in the past few years was recorded by France, Luxembourg and Portugal, where the road fatality figures between 2001 and 2006 fell by over 40 per cent. Even so, in all three countries the

ROAD DEATHS IN EUROPE (EU 27)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Austria	1,551	1,403	1,283	1,338	1,210	1,027	1,105	963	1,079	976	958	956	931	878	768	730
Belgium	1,873	1,671	1,660	1,692	1,449	1,356	1,364	1,500	1,397	1,470	1,486	1,306	1,214	1,162	1,089	1,069
Bulgaria	1,114	1,299	1,307	1,390	1,264	1,014	915	1,003	1,047	1,012	1,011	959	960	943	957	1,043
Cyprus	103	132	115	133	118	128	115	111	113	111	98	94	97	117	102	86
Czech Republic	1,331	1,571	1,524	1,637	1,588	1,562	1,597	1,360	1,455	1,486	1,334	1,431	1,447	1,382	1,286	1,063
Denmark	606	577	559	546	582	514	489	499	514	498	431	463	432	369	331	306
Estonia	490	287	321	364	332	213	280	284	232	204	199	223	164	170	169	204
France	10,483	9,902	9,865	9,019	8,892	8,540	8,445	8,920	8,486	8,079	8,162	7,655	6,058	5,530	5,318	4,709
Germany	11,300	10,631	9,949	9,814	9,454	8,758	8,549	7,792	7,772	7,503	6,977	6,842	6,613	5,842	5,361	5,091
Great Britain	4,753	4,379	3,957	3,807	3,765	3,740	3,743	3,581	3,564	3,580	3,598	3,581	3,658	3,368	3,336	3,297
Greece	2,112	2,158	2,160	2,253	2,412	2,157	2,105	2,182	2,116	2,037	1,880	1,634	1,605	1,670	1,658	1,657
Hungary	2,120	2,101	1,678	1,562	1,589	1,370	1,391	1,371	1,306	1,200	1,239	1,429	1,326	1,296	1,278	1,305
Ireland	445	415	431	404	437	453	473	458	414	418	412	376	337	374	399	368
Italy	8,109	8,053	7,187	7,091	7,020	6,676	6,714	6,313	6,688	6,649	6,691	6,739	6,065	5,692	5,818	5,669
Latvia	923	729	670	717	611	550	525	627	604	588	558	559	532	516	442	407
Lithuania	1,193	779	893	765	672	667	752	829	748	641	706	697	709	752	760	759
Luxembourg	83	69	78	65	70	71	60	57	58	76	70	62	53	49	46	36
Malta	16	11	14	6	14	19	18	17	4	15	16	16	16	13	17	10
Poland	7,901	6,946	6,341	6,744	6,900	6,359	7,310	7,080	6,730	6,294	5,534	5,827	5,640	5,712	5,444	5,243
Portugal	3,217	3,086	2,701	2,505	2,711	2,730	2,521	2,126	2,028	1,877	1,670	1,655	1,542	1,294	1,247	969
Rumania	3,782	3,304	2,826	2,877	2,845	2,845	2,863	2,778	2,505	2,499	2,461	2,398	2,235	2,418	2,641	2,478
Slovakia	614	677	584	633	660	616	788	819	647	628	614	610	645	603	560	579
Slovenia	462	493	493	505	415	389	357	309	334	313	278	269	242	274	258	262
Spain	8,837	7,818	6,375	5,612	5,749	5,482	5,604	5,956	5,738	5,777	5,517	5,347	5,400	4,749	4,442	4,104
Suomi/Finland	632	601	484	480	441	404	438	400	431	396	433	415	379	375	379	336
Sweden	745	759	632	589	572	537	541	531	580	591	583	560	529	480	440	445
The Netherlands	1,281	1,253	1,235	1,298	1,334	1,180	1,163	1,066	1,090	1,082	993	987	1,028	804	750	730
Total	**76,076**	**71,104**	**65,322**	**63,846**	**63,106**	**59,357**	**60,225**	**58,932**	**57,680**	**56,000**	**53,909**	**53,090**	**49,857**	**46,832**	**45,296**	**42,953**

Source: CARE (EU road accidents database) or national publications European Commission/Directorate General Energy and Transport, December 2007

Young motorists overestimate their capabilities, and this – coupled with little practical driving experience – continues to make them a high accident risk. In addition, it is precisely the learner driver who frequently drives old, cheap and – very often – poorly maintained cars.

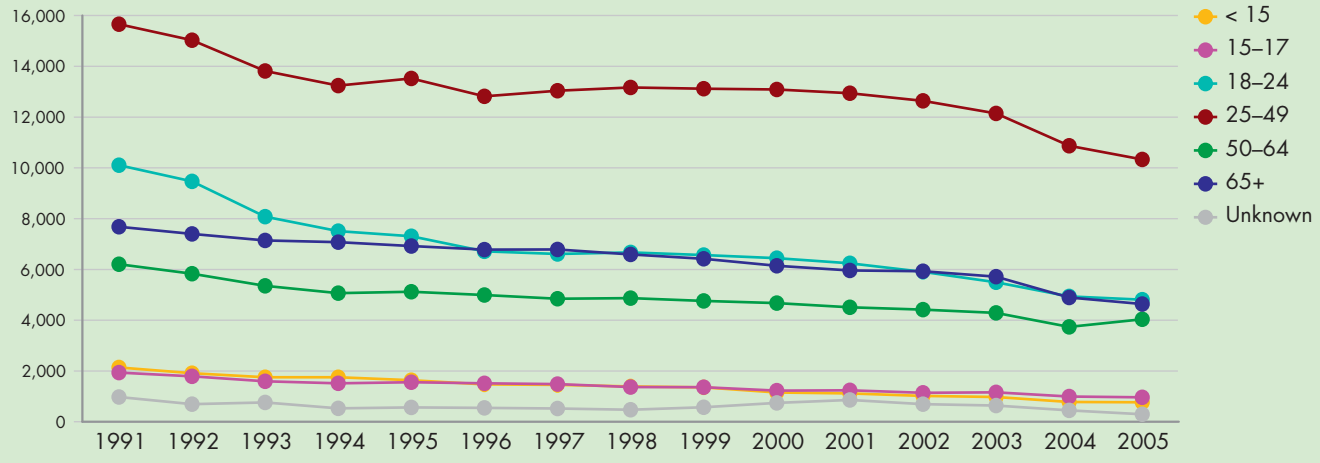
number of road fatalities as a percentage of the population is still higher than the level recorded in Germany and other EU states. With 62 road fatalities per million inhabitants, Germany comes eighth in the ranking drawn up by the European Transport Safety Council behind Malta, the Netherlands, Sweden, Great Britain, Denmark and the non-EU states of Switzerland and Norway.

In contrast, the number of fatal road accidents in Estonia, Hungary and Lithuania in the past few years has even gone up.

MAN AND TECHNOLOGY

There is a whole range of ways to further reduce the number of road deaths. For example, older vehicles have an inherently high accident potential because they are very rarely fitted with modern safety technology such as ESP. Furthermore, as a vehicle ages, the number of faults – mostly involving safety-relevant components – also rises. This is due to the fact that the willingness of owners to maintain their cars properly falls sharply as the age of the vehicle increases. This is a phenomenon

ROAD DEATHS IN THE EU ANALYSED ACCORDING TO AGE GROUP



Source: European Commission/Directorate General Energy and Transport

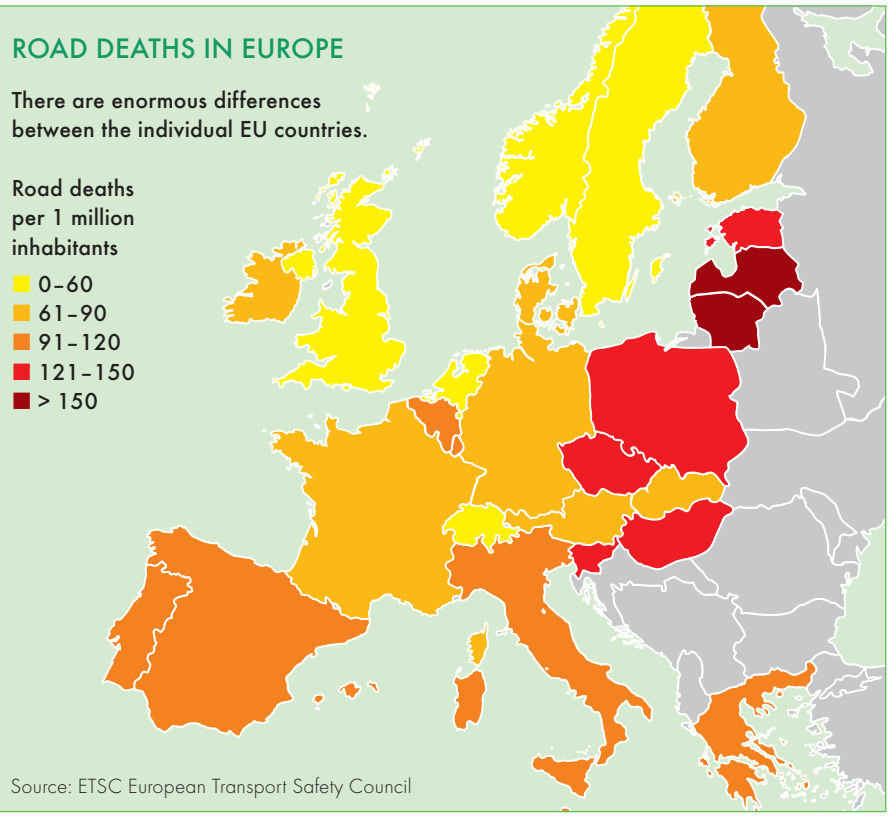
that is not unique to Germany. In addition, these older vehicles are frequently driven by motorists in the 18-24 age group.

The current level of accident risk on the road should not be regarded as acceptable because the technically achievable accident prevention potential of new vehicles has still not been fully exploited. For instance, if a greater number of vehicles were equipped with driver assistance systems, this would make a significant contribution to preventing accidents and lessening their consequences. If today all new cars were fitted with the electronic stability program ESP as standard equipment, around 1,800 road deaths and more than 40,000 injuries could be prevented across Europe by 2012.

Modern safety technology equipment should therefore be fitted to all new vehicles. This has been borne out time and time again by the evaluations of DEKRA Accident Research. Above all else, it must not be forgotten that the functionality of such systems must be maintained over the entire service life of the vehicle. The inspection of electronically regulated vehicle systems relevant to safety that already forms a part of the main inspection in Germany plays an important role in this regard. There can be little doubt that road safety represents the interaction of various factors and In order to achieve significant progress in the future in this respect the general condition and the safety equipment of a vehicle are just as important as the behaviour of the person at the wheel. The specific instances of where there is a need for improvement and where measures can be implemented to considerably increase road safety again are outlined in the following chapters of this report.

ROAD DEATHS IN EUROPE

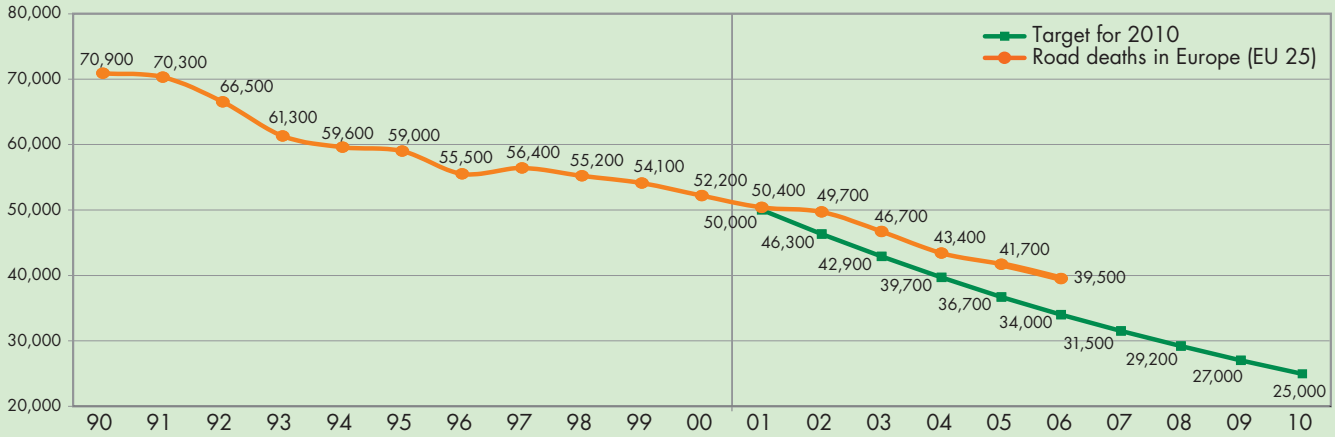
There are enormous differences between the individual EU countries.



Source: ETSC European Transport Safety Council

EU CHARTER FOR ROAD SAFETY

The aim is to reduce the number of deaths on the road in Europe to 25,000 per annum by 2010.



Source: CARE (EU road accidents database) or national publications, European Commission/Directorate General Energy and Transport, December 2007

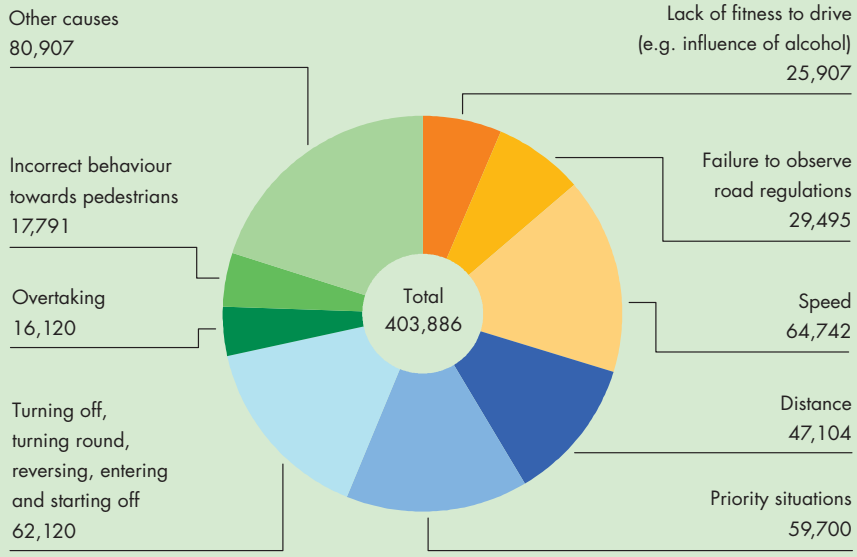
An important factor on the road: the human element

Road accidents always have several causes. In many cases technical defects in the vehicle and the environmental conditions often have a key role to play. When inattentiveness, excessive speed or alcohol are also added to the mix, the risk of an accident increases many times. The person at the wheel is and remains one of the really big risk factors on the road. This is particularly true of inexperienced drivers. However, older motorists must also be aware of their responsibilities on the road.

A thought-provoking finding: in 2005, a survey by the Federal Statistics Office revealed that in around 94 per cent of the cases studied, human beings were the main cause of accidents involving personal injury. Additional influences such as the state of the vehicle and the environmental conditions played a role in about 13 per cent of cases. At first glance this appears to represent a disproportionate relationship. However, the statistics include multiple causes. In many instances, therefore, the person involved was not wholly responsible for an accident because his or her incorrect behaviour was frequently compounded by technical faults in the vehicle. Consequently, these statistics only go some way to establishing the actual causes of an accident, e.g. the initial impressions recorded by the police within a week of the accident are also taken into account. Even so, the statistics clearly highlight that measures designed to prevent accidents must not be limited to the vehicle or road construction, for

MOTORISTS' MISTAKES

Accidents involving personal injury on the road in 2006



Source: Federal Statistics Office

instance. Enhanced technology alone will not be able the meet the road safety challenges in the long term.

It is precisely inexperienced drivers or drivers aged between 18 and 24 who are the focus here, as they are involved in significantly more accidents on the road than drivers in other age groups. Let's take Germany for example: A survey by the Federal Statistics Office shows that a total of 84,303 people aged between 18 and 24 were involved in accidents in 2006. 1,011 were fatally injured, amounting to approximately one fifth of all road fatalities in Germany although this age group makes up only 8.2 per cent of the entire population. Even so, the figures indicate a fall of six per cent in comparison to the year before.

France presents a similar picture; there 1,037 motorists between the ages of 18 and 24 lost their live in 2006 and again that constitutes slightly more than one fifth of all road deaths. However, in comparison to the previous year the fall registered in this age group was over 15 per cent. In Italy and the Czech Republic, too, motorists aged between 18 and 24 made up about one fifth of all road fatalities in 2006.

OVERESTIMATION OF THEIR OWN CAPABILITIES, EXCESSIVE SPEED AND DRINK-DRIVING ARE THE REASONS WHY YOUNG MOTORISTS ARE FREQUENTLY INVOLVED IN SERIOUS ACCIDENTS

Irrespective of which country is put under the spotlight, the risk factors in this age group are always the same. For example, despite their still very rudimentary driving experience e.g. insufficient knowledge of the roads the vehicle learner drivers very often think they can drive just as fast and safe as drivers who have held a driving licence for much longer. They frequently underestimate the risk of driving at speed and in the process endanger not only themselves but other road users. Above all, among young male drivers the readiness to take risks plays an important role. This can express itself in foolhardy overtaking manoeuvres, excessive speed and driving too close to the vehicle in front.

The police have identified inappropriate speed as being the most common cause of accidents for which young drivers are responsible. This lack of adjustment can have something to do with the fact that the young drivers are unaware of the effects of their fast driving. They are often unable to anticipate how their vehicle will react at high speeds, cannot estimate the length of the braking path and are not adequately prepared for the reactions of other road users.

Old vehicles are not only a burden on the environment, but also fail to match the safety technology fitted to a new vehicle. The risk of an accident thereby increases.

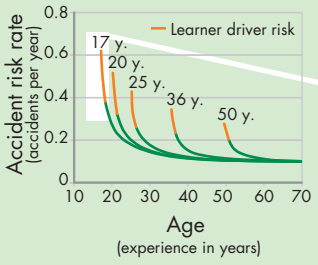
A further problem is that young people are just starting out on their professional careers and only rarely have the financial means available to afford a new car. Vehicles owned by young road users frequently do not possess the latest technical safety and environment- friendly systems equipment found in a new vehicle. On average, the first vehicle a young person drives is nine years old and has usually already racked up a high mileage. The result is a dangerous combination of vehicles without contemporary safety technology, age-related vehicle faults and inexperienced drivers.

ACCIDENT RATE PEAKS AT THE WEEKEND

The 18 – 24 age group is also prominently involved in alcohol-related accidents. People often drink on the spur of the moment and in the company of others. Young people start off by stating that the driver has either had hardly anything or even nothing at all. Yet, this "hardly anything" is already an underestimation on the part of many. Many do drink more than originally intended, but despite this still consider themselves sober enough to drive a car.

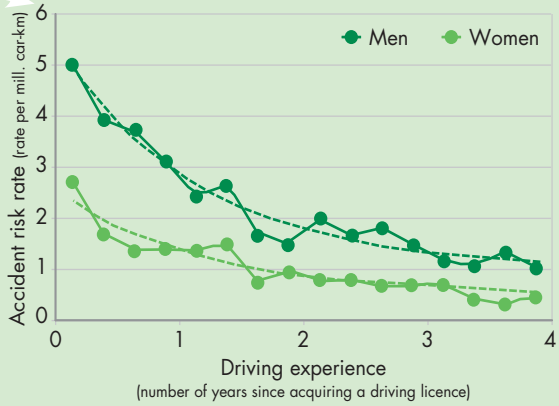
A further risk factor is that many young people soon tire of the entertainment available in rural areas and want to experience something new and get to meet new people. As this is frequently not

LEARNING CURVE OF LEARNER DRIVERS IN GERMANY



Source: The Influence of age and experience on accident risk (Maycock et al., 1991)

CENTRAL TRAFFIC REGISTER – ACCIDENTS



Source: Schade, 2001

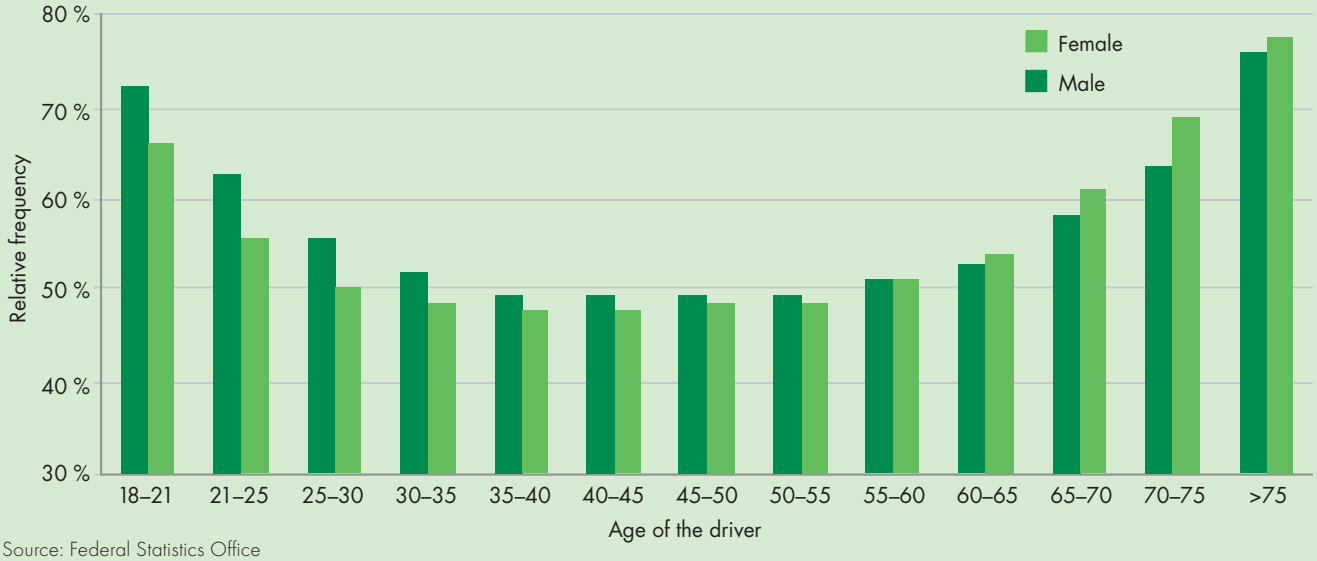
More breathalyser tests by the police could lower the level of accident risk of young motorists in particular.

possible in the countryside, young people sometimes drive for more than an hour in an evening to meet up at a disco or at a popular hangout in town. For beginner drivers, this journey can already be very strenuous in itself, as they are not used to covering long distances. They are distracted by their passengers and on the way back the effects of fatigue as an important risk factor cannot be ignored. Most accidents, therefore, take place at the weekend between 7 p.m. and 5 a.m.

EXTENSIVE CATALOGUE OF MEASURES

It is accepted that to some extent inconsiderate behaviour of other road users can be, responsible for the fact that so many young drivers are involved in road accidents and lose their lives. For example, more experienced drivers like to devise their own interpretation of the road traffic regulations – which does not necessarily mean that they speed or act dangerously for others. Driving slightly but continuously faster than allowed is simply a part of their driving style. A learner driver who strictly observes the prescribed speed limits is often seen as a hindrance and can soon feel pressu-

PRINCIPAL PERSON RESPONSIBLE FOR ACCIDENTS INVOLVING PERSONAL INJURY ANALYSED ACCORDING TO AGE GROUP



Source: Federal Statistics Office

rised by other drivers driving too closely behind them or by being on the receiving end of aggressive overtaking manoeuvres. One of the results of this constant pressure is that the learner drivers adapt to the driving behaviour of other road users, take them as a role model and themselves develop an insensitive driving style.

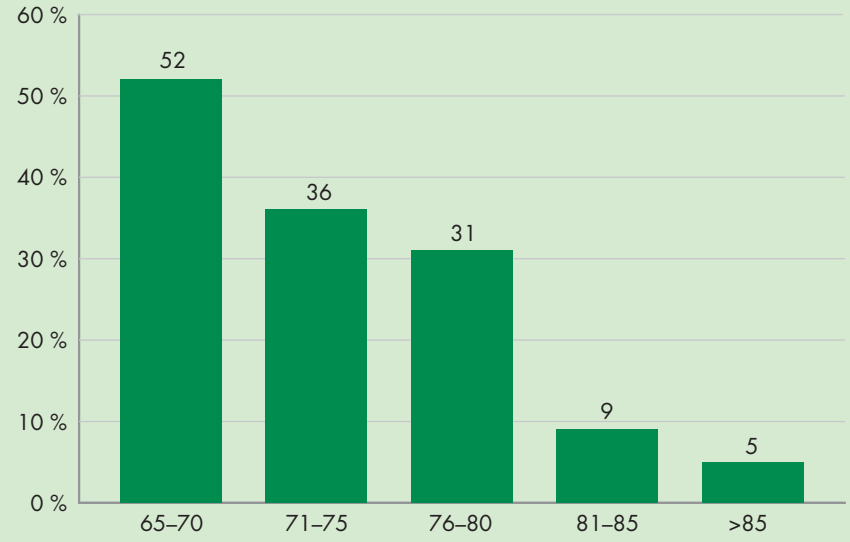
Possible ways of solving the problem could include putting learner drivers at the wheel of a driving simulator under the simulated influence of alcohol. Another idea could be to oblige them to participate in a driving safety training programme for about a year after they have obtained their licence. A shuttle service as well as more breathalyser tests and police checks around discos could likewise reduce the risk of accidents. As far as the vehicle itself is concerned, safety should be the overriding criterion when buying a car. In an attempt to check the inconsiderate behaviour of other road users, heavier fines would have to be levied on drivers tailgating others, especially on country roads. In addition, the pilot scheme "accompanied driving from 17", which has now been introduced throughout Germany, as well as the ban on alcohol for beginner drivers coming into force on 1st August 2007 are bound to reduce the risk of accidents among this age group.

OLDER MOTORISTS ARE FREQUENTLY INVOLVED IN ROAD ACCIDENTS, TOO

Although it is a fact that younger people are the ones most likely to be involved in road accidents, one in ten of all those affected by an accident in Germany in 2006, was 65 years of age or older. 23 per cent of the senior citizens who were involved and were over the age of 65 lost their lives, which is considerably greater than the of those merely involved in an accident. This information alone is obviously not enough to enable us to draw conclusions about the age-related accident risk. Therefore, in order to find out more about accidents involving elderly drivers and to attempt to find ways to let them maintain mobility well into old age, DEKRA Accident Research has launched its own study based on 133 accidents. The Federal States of Baden-Württemberg and Saxony were chosen as representative of the general situation.

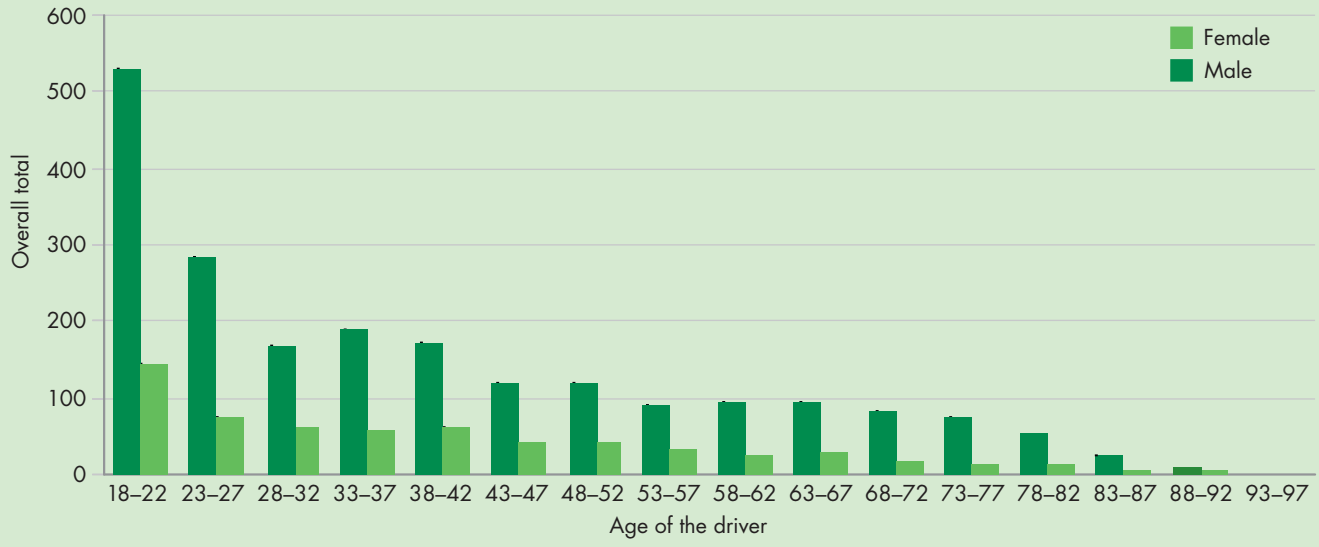
The study is also important because the demographic development in Germany and elsewhere points towards there being a significantly greater number and percentage of older people within the population in the future. There are two reasons why we will see the over-65 age group being increasingly represented among the active driving public. Firstly,

AGE DISTRIBUTION WITHIN THE DEKRA STUDY



Source: DEKRA, n=133

NUMBER OF MOTORISTS KILLED AND ANALYSED ACCORDING TO AGE GROUP



Source: Federal Statistics Office

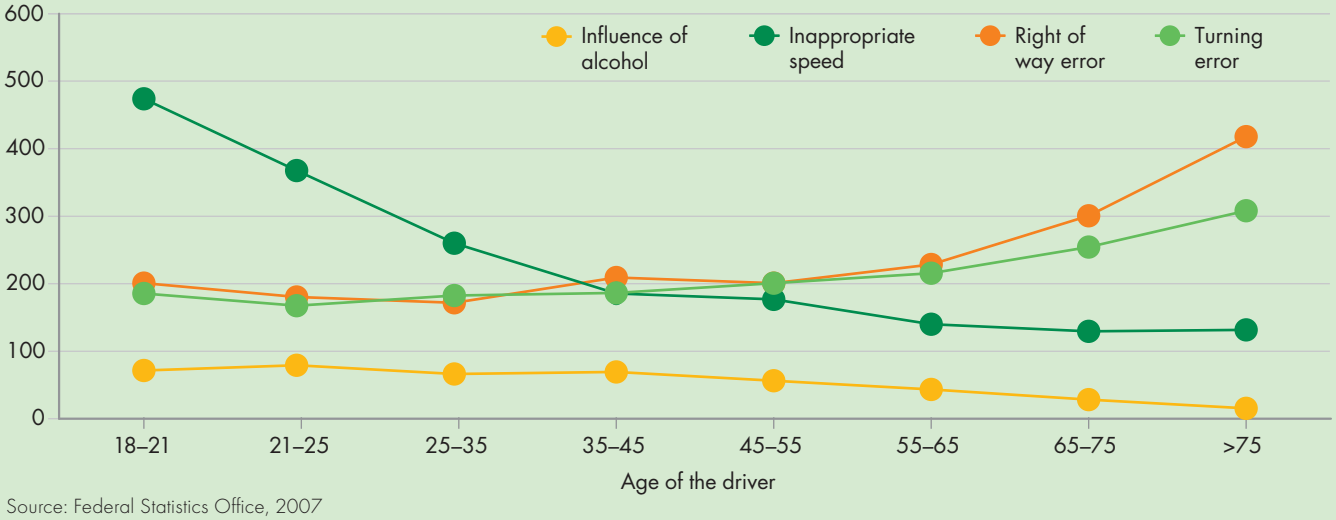
there are more and more people in this age group, and secondly, the number of those holding a driving licence is growing. In 2015 about 90 per cent of the men over 80 will hold a driving licence while in 2025 approximately 90 per cent of the women over 80 will hold a driving licence.

Individual mobility will continue to be a prized asset in our society in the future. It is now quite normal for people to have their own car and it is something they are not prepared to give up readily, even in old age. Simple tasks such as shopping or visiting the doctor are made considerably easier for elderly people if they own their own car. However, it is also indisputable that increasing age affects driving behaviour. Factors such as slower reaction times, failing vision and hearing, restricted movement and failing strength adversely affect a person's ability to drive a motor vehicle safely in current traffic conditions. The influence of medication should also not be underestimated.

GRASPING A TRAFFIC SITUATION BECOMES MORE DIFFICULT

Merely considering the number of persons killed on the road and breaking this down into age groups gives no indication of the particular specifics of the problem. In fact, quite the opposite is true; the numbers even fall as age increases. The reason for this, however, is the pronounced reduction in the number of people driving as they become older. If, in contrast, the person chiefly responsible

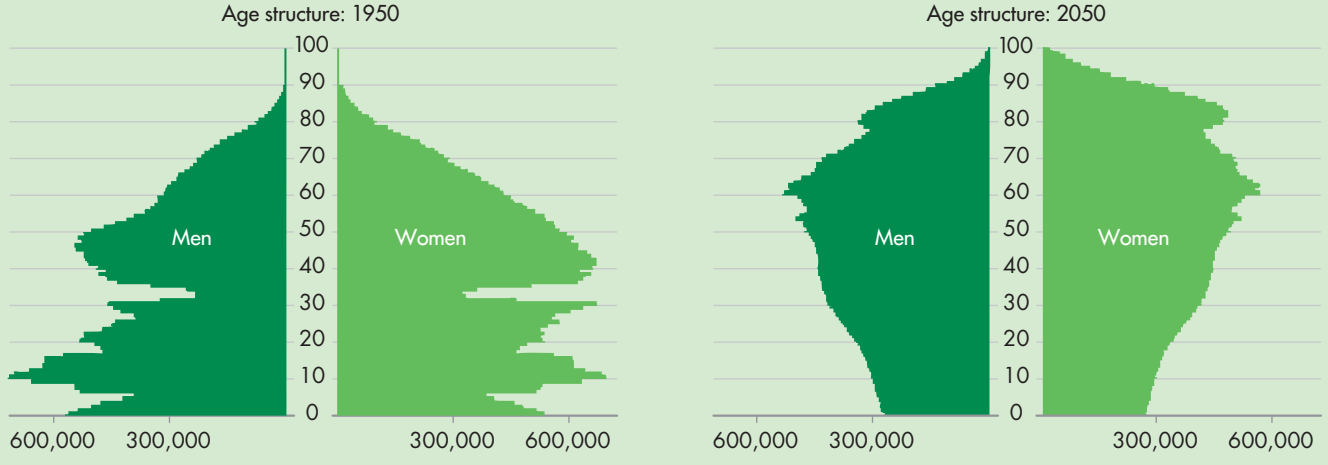
THE PRINCIPAL CAUSES OF ACCIDENTS PER 1,000 PERSONS INVOLVED



Source: Federal Statistics Office, 2007

POPULATION TRENDS IN GERMANY

The demographic trend in the Federal Republic of Germany shows that the low birth rate of about 1.3 births per woman (as of 2005) will lead in the long term to a significantly larger percentage of elderly persons in Germany. The traditional bell shape of the population pyramid has already disappeared. The graph shows the age distribution of the population in 1950 as well as the expected distribution in 2050.



Source: Federal Statistics Office

The over-65 age group will be increasingly represented among the active driving public in future.

for an accident involving personal injury is studied, the picture is a completely different one. The proportion of people aged 75 and over who cause accidents even exceeds that of young learner drivers.

In France, the UTAC (Union Technique de l'Automobile, du Motocycle et du Cycle) discovered that the number of road fatalities in the 65-plus age group in 2006 totalled 916; that is 175 fewer than in the 18-24 age group. However, per 100 personal injuries, the 64-plus age group recorded ten fatalities, but the 18 – 24 age group "only" five. In France, too, elderly drivers therefore run a far greater proportionate risk of dying in a road accident.

Another interesting observation is that the type of accident also changes with increasing age. Whereas inappropriate speed is the undisputed main cause for young people's involvement in accidents, elderly people are involved in right of way errors and mainly complex traffic situations such as turning off. In very many of the accidents studied, the situation simply overtaxed the elderly road user. This overtaxing manifests itself as a slow reaction time and inability to become rapidly aware of a changed traffic situation – and further aggravated by physical incapabilities such as, for example, reduced ability to effectively look over one's shoulder. Many cases involved a reverse reaction. For example, the reverse gear is engaged following a collision and the vehicle reverses out of the situation at high speed. The resulting damage is then frequently significantly greater than that caused by the original impact. In minor collisions the responsible driver very often departs from the scene of the accident illegally. This can be ascribed in many instances to failing age-related acoustic and sensory perception although other reasons also play a role. When questioned about illegally leaving the scene of the accident, many reacted by stating that "I have never caused an accident in my life – you're trying to blame me for something I haven't done". There is little doubt that fear of losing the driving licence also plays a role.

Many accidents occur because motorists do not always observe the prescribed speed limit.

Easy-to-operate comfort systems help elderly motorists to stay at the wheel.

INTELLIGENT AUTOMOTIVE TECHNOLOGY HELPS MAINTAIN MOBILITY

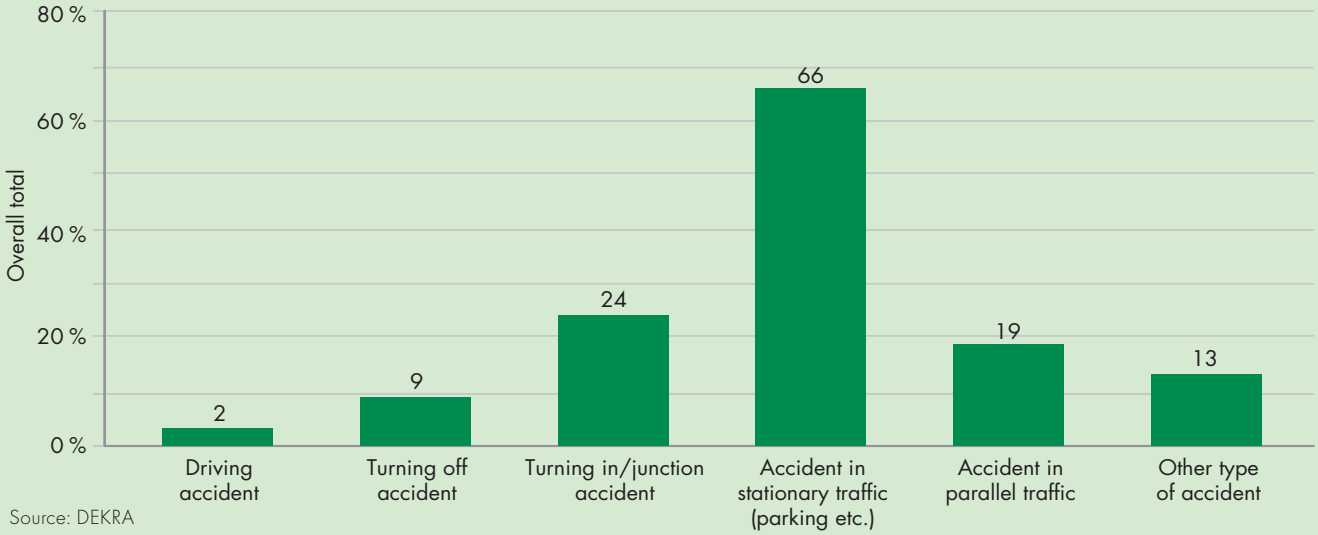
In order to help elderly people to stay mobile by being able to driving their own car for as long as possible, it is absolutely necessary not only to provide traffic-related psychological and medical advice, but to equip the vehicles accordingly. For instance, a high sitting position in combination with wide-opening doors and large door openings would facilitate getting into and out of the car. Robust handgrips fitted to the front roof lining or to the A-pillar could also help in this respect.

The instruments must be arranged clearly and easily distinguished from one another. Red, green and blue dashboard lighting may score points for design, but the colours make the instruments difficult to read and not just for the elderly. The automotive and supplier industry should give more weight to physiological considerations rather than contemporary design.

The comfort systems should be clear and easy to operate. Single-knob operation and one central display may be sales arguments for technology fans, but they challenge the patience of many an elderly person. Logic functions are incorrectly used or not even used at all, and the person ends up entirely focusing on operating the technology and not on the situation on the road.

Parking assistant systems help the driver during parking. Having said that,

TYPES OF ACCIDENT



Source: DEKRA

the acoustic signals given must clearly distinguish between the front and rear of the vehicle. Additionally, the selected frequency of the tone must lie in a range that most elderly people can hear. Inter-vehicle distance regulation and the night-driving assistant will provide significant help for drivers in the future and may even enable the aged to drive at twilight hours and at night.

MOTORISTS NEED TO BE AWARE OF THEIR RESPONSIBILITIES – WHATEVER THEIR AGE

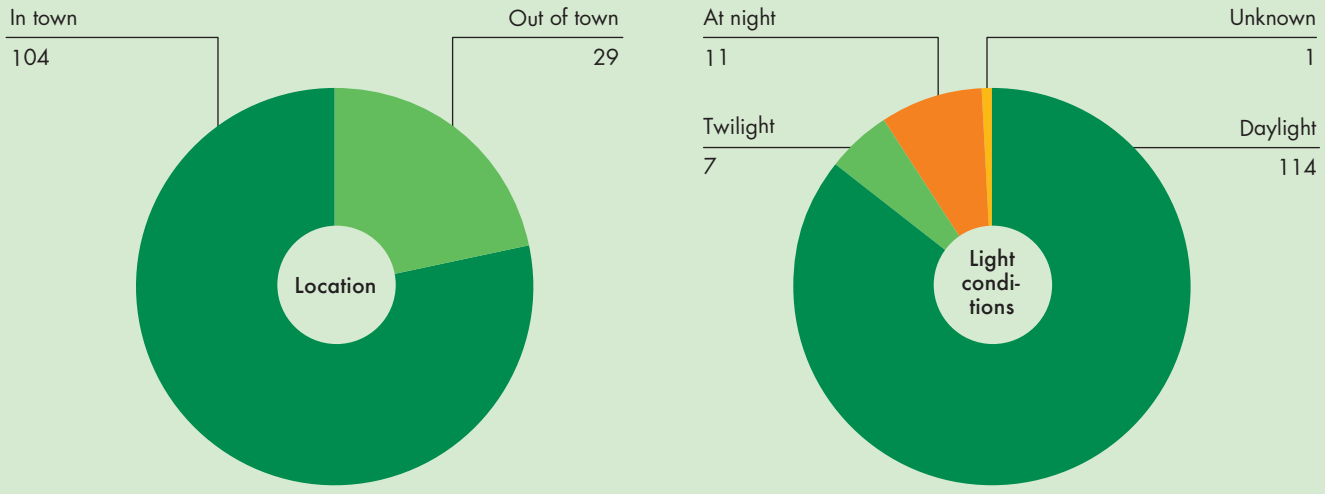
First of all, infrastructure measures need to be introduced. For example, clear directional signs with clearly distinguishable markings are far from being the rule everywhere. An effective expansion of public transport services suited to the needs of the elderly can offer an alternative to owning a car without drastically curtailing the person's ability to remain mobile. Nevertheless, the best public transport network will not find favour with elderly people if they haven't learnt to use it regularly when they were younger.

The basis for safe driving is being able to correctly estimate one's own abilities. Frequently, relatives of the elderly recognise that a question mark hangs over the elderly person's driving suitability, which, however, is ignored by the person affected. All sides require workable solutions here. Withdrawal of the driving licence when a person reaches a stipulated age, as is the case in some countries, cannot seriously be deemed as a sensible approach. It is rather the case that every driver must be aware that driving a vehicle is a responsible task – whatever the person's age. Many ways of ensuring mobility and at the same time of testing a person's driving suitability have been put forward.

Roundabouts: clear and simple rule apply – and yet they are all too often ignored.

As far as the fostering, maintenance and re-acquisition of individual mobility for elderly motorists is concerned, traffic-related psychological and/or medical aspects are particularly important. A suitable advisory service could reveal any deficits affecting competence and devise individual compensatory options. This is what DEKRA does with its mobility check carried out at its assessment centres for driving suitability. The voluntary check provides information on the capabilities of a drive, establishes clarity about the physical preconditions for driving a motor vehicle and also gives an insight into a person's driving behaviour under real-life conditions. How they eventually implement the recommendations and the consequences they draw from it is a matter for the participant.

DISTRIBUTION OF ACCIDENTS INVOLVING SENIOR CITIZENS (65 AND OLDER)



Source: DEKRA, n=133

Expert appraisals reveal the causes and course of the road accident.

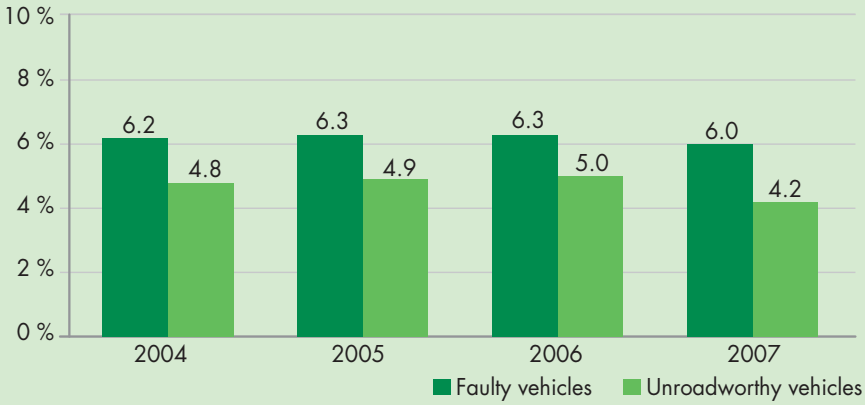
Safe driving in a safe vehicle

For many years now periodic technical vehicle inspections have played a major role in ensuring that the level of road safety on Europe's roads has constantly increased. This is not surprising because, after all, the main inspection is there to uncover and rectify faults in the vehicles. As data gathered from DEKRA testing and inspection and DEKRA accident analysis reveals, this is a particularly important requirement in the case of older vehicles as the fault rate/frequency increases the longer the car is on the road. The standardised shortening of inspection periods for older cars throughout Europe to one year could doubtless further reduce the risk of accidents.

Front, side and head airbags, electronic components such as ABS, ASR or the anti-slip system ESP, rigid passenger cells and much, much more – all these have allowed active and passive safety measures in vehicles to improve greatly in the past few years. Almost all newly registered cars meet this high safety standard. In this context, it is important that they not only form an initial part of the vehicle equipment, but also function throughout the entire service life of the vehicle. Ensuring this is a key task of periodic vehicle monitoring across Europe.

Checking the electronic components is admittedly merely a part of the main inspection carried out in accordance with Section 29 of the Road Traffic Licensing

VEHICLE COMPLAINTS IN THE CZECH REPUBLIC



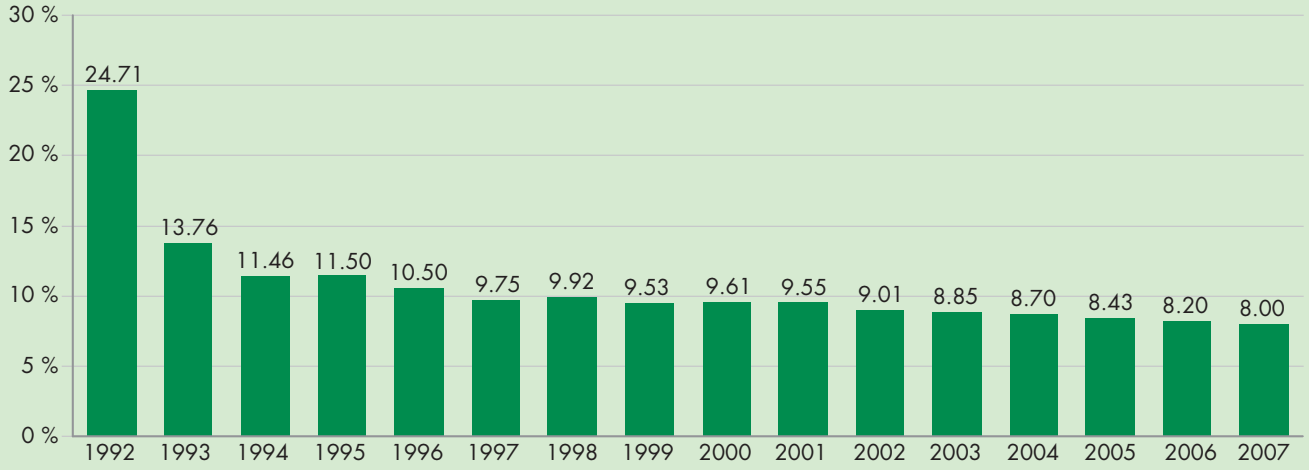
Source: DEKRA ÚSMD

Regulations. Brakes and steering are subject to the inspector's scrutiny just as much as the lights, axles, wheels and tyres, suspension, running gear, frame and bodywork or glazing, to name just a few items. Periodic technical inspection has established itself throughout Europe. Although there can be considerable national variations, including both the inspection periods and the qualifications of the inspectors, the EU directive 96/96/EC sets out binding minimum requirements pertaining to the execution of these inspections. In this respect Europe is following a good and correct path. This can be seen not only in Germany but also in France and the Czech Republic as well as elsewhere. The introduction of the obligatory Contrôle Technique in France in 1992 improved the technical condition of the vehicles on the road perceptibly. The fault rate/ frequency for numerous components such as brakes or the lights sank by 50 per cent and more. In the Czech Republic, too, the periodic technical vehicle inspection system has produced high quality results in the past few years.

The importance of periodic inspection can be clearly seen from the results of the main inspections carried out in Germany by DEKRA in 2007. Of all cars, 46 per cent had faults. Or to put it another way: almost every other vehicle was in a faulty condition. 30 per cent of the vehicles

BRAKE FAULTS IN FRANCE

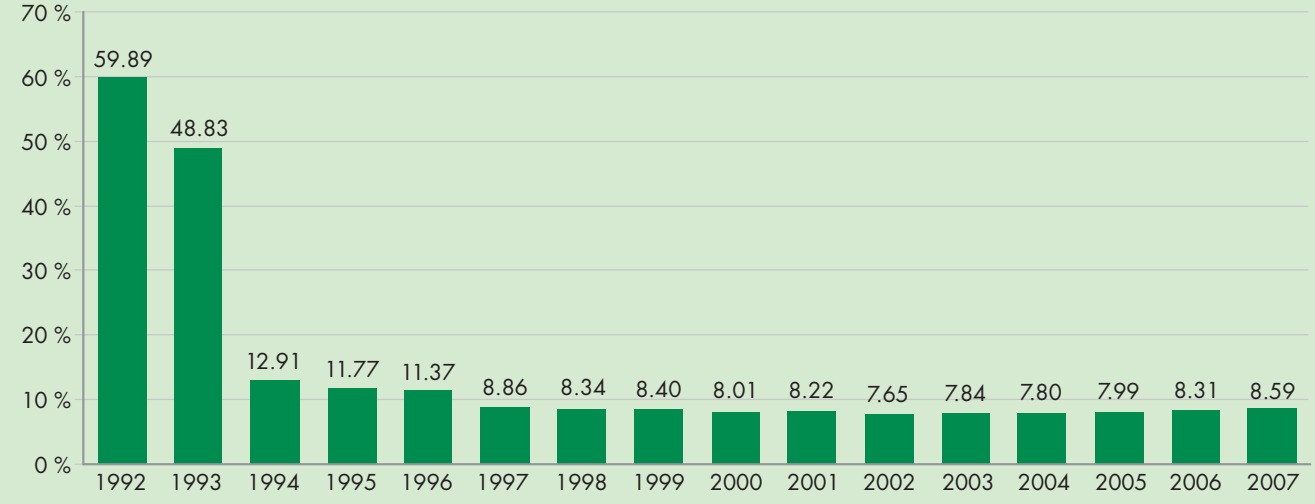
Over the past 15 years brake faults have fallen in France by almost 60 per cent.



Source: UTAC

LIGHT SYSTEM FAULTS IN FRANCE

Light faults have even fallen by over 85 per cent over the last 15 years.



Source: UTAC

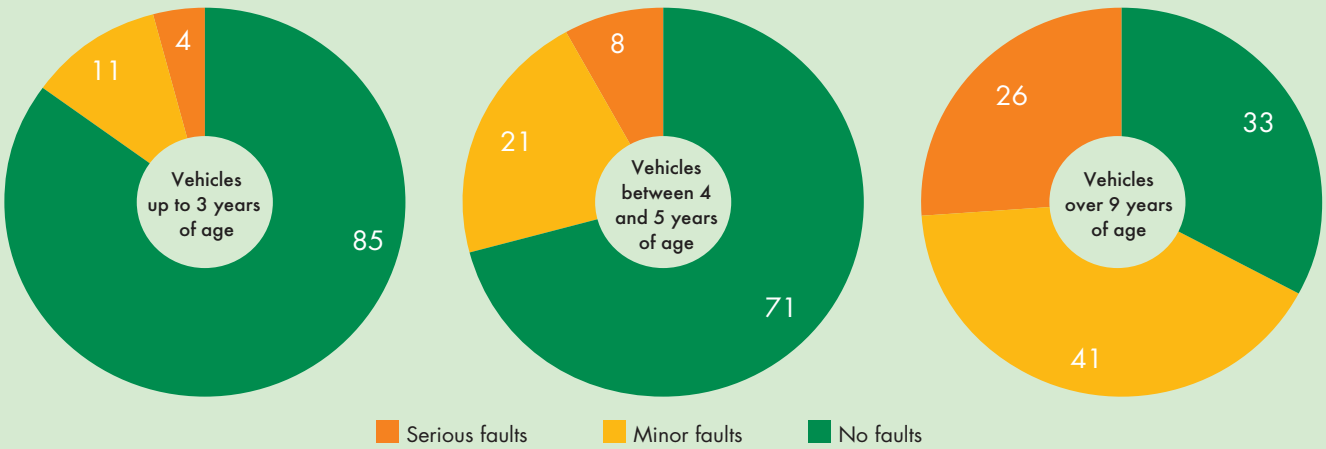
The introduction of active and passive safety measures to new vehicles has increased considerably in the past few years. However, this does not dispense with the need for regular technical inspection.

displayed minor faults, but a noteworthy 16 per cent displayed serious faults.

THE NUMBER AND SEVERITY OF FAULTS INCREASE WITH VEHICLE AGE

If the above results are now broken down according to vehicle age, a completely different picture emerges. About 15 per cent of vehicles up to three years old display faults, while the figure for vehicles between five and eight years old is almost 30 per cent. Vehicles over nine years old record a fault rate of 67 per cent and 26 per cent of vehicles in this group display serious faults. Finally, the actual fault quota of the vehicles on the road is undoubtedly much higher than the figures that appear in the various fault statistics. The reason for this is that many main inspections take place in workshops where the necessary service work has been carried out beforehand so that the vehicles are prepared prior to being presented

FINDINGS OF MAIN INSPECTIONS CARRIED OUT ON CARS BY DEKRA IN 2007



Source: DEKRA

Details in per cent

for the main inspection. Looking at the detected faults shows that the brakes and the lights each with over 21 per cent take first and second place respectively. Brake disc, brake lining and brake hose are the predominant brake faults. Axles with wheels and tyres as well as running gear and bodywork are also well represented in this name-and-shame ranking with over 16 and 11 per cent respectively. While the inspection engineers only found brake system faults on about four per cent of cars up to three years old, this figure increased to more than 40 per cent on cars over nine years old. This marked increase is reflected across all component groups. What this shows is that generally speaking the older the vehicle, the more faults it will have.

OLDER VEHICLES PRESENT A HIGH LEVEL OF POTENTIAL ACCIDENT RISK

The results from the DEKRA Inspection Department are reflected by DEKRA accident analyses. Here, too, there are significant differences in the technical condition of new and old cars. Across all age ranges, examinations of cars involved in a road accident revealed that 24.9 per cent of them had serious faults. The appraisers found only serious faults on 11.3 per cent of accident cars under three years old.

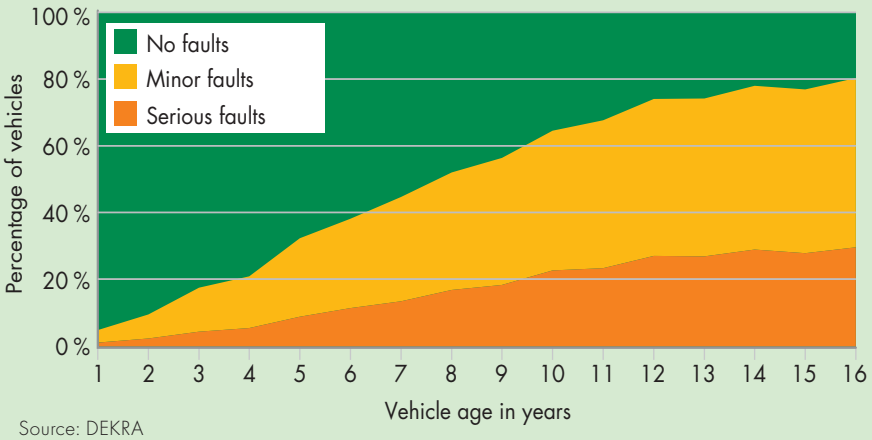
From the fifth year on, the figure of 22.7 is still slightly below the average. Serious faults were found on 40 per cent of accident cars over nine years old.

Brakes, tyres and chassis were the systems most commonly affected. Damaged brake lines, brake calipers or brake linings were in turn the most dominant cause of accident-related faults on the brake systems. Taking all component groups into account, the likelihood that something like a defective or insufficiently repaired brake component or an old, worn or damaged tyre will trigger an accident is generally very high. In many cases the driver or owner can detect some of the most prominent faults. As a rule, however, the faults are picked up on at the latest at an inspection in a specialist workshop or at the main inspection.

Clearly, not every vehicle fault necessarily leads directly to an accident, but every fault increases the danger that the car becomes involved in an accident. In this respect, a car between seven and nine years of age inherently has three times as much risk potential as a car aged between one and three years.

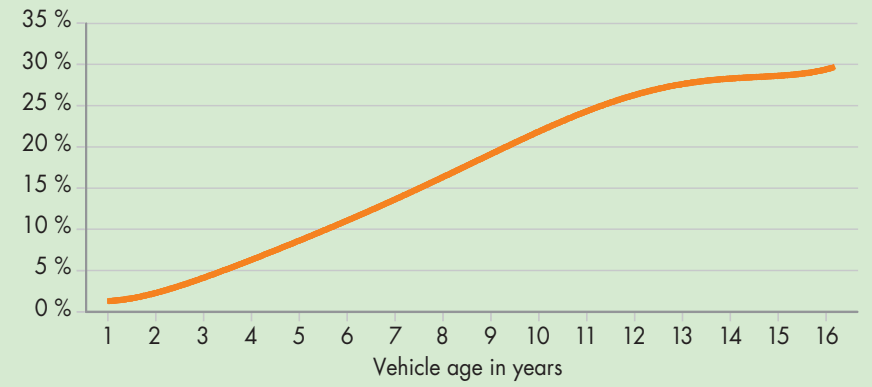
This fact is all the more worrying when we consider that the average age of a car on Germany's roads is now over

MAIN FINDINGS OF CAR INSPECTIONS IN 2007



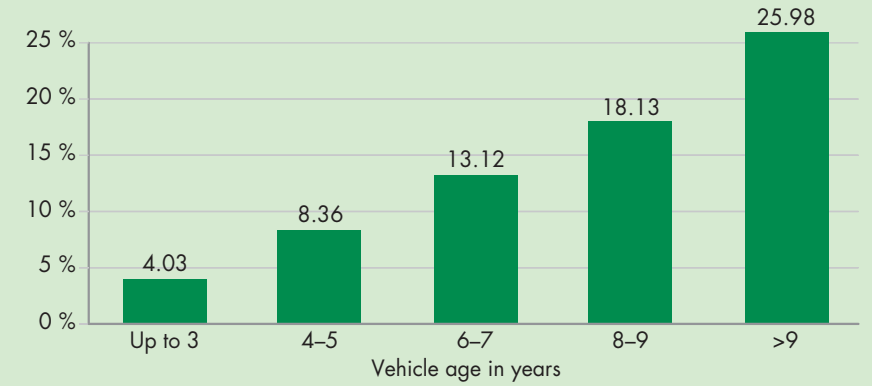
Source: DEKRA

PERCENTAGE OF CARS WITH SERIOUS FAULTS AT MAIN INSPECTIONS IN 2007



Source: DEKRA

CONSIDERABLE FAULTS ON CARS IN 2007 AT MAIN INSPECTIONS*



*NB: Many vehicles are prepared for the inspection in a workshop before the main inspection.

Before the appraiser enters the picture, details of the accident are recorded by the police.

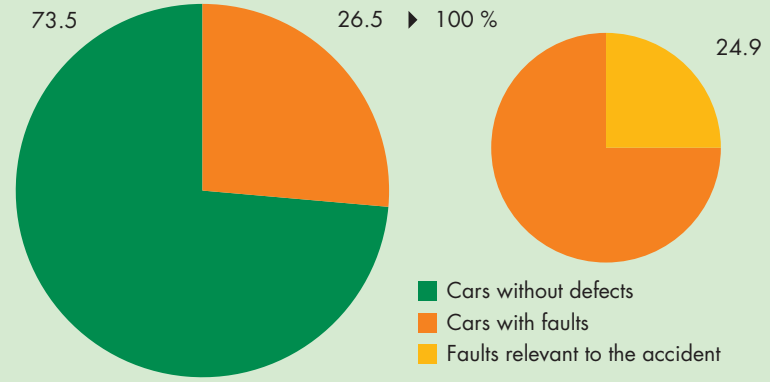
eight years. As a comparison: in 2007 the average age of a car in France was 7.9 years, in Italy 8.4 years and in the Czech Republic almost 14 years even. In Germany the average age is 8.1 years and a car has usually reached the end of its active service life after 12 years.

WORKSHOPS ARE NOT USED AND MANY DRIVERS DO THEIR OWN REPAIRS

As the age of the car increases, the willingness on the part of the motorist to take the vehicle to a workshop for maintenance and repair work decreases. This results in a rise in the number of faults and thus in the potential danger level. Many of the really necessary repair requirements are neglected or dealt with by do-it-yourself measures which often lead to dubious results. An annual survey carried out on behalf of the German Automobile Trust (Deutsche Automobil Treuhand – DAT) reveals that the amount of do-it-yourself maintenance is related to the age of the vehicle. In 2007 only two per cent of cars between four and six years of age were subject to do-it-yourself repairs, whereas for cars over eight years of age this figure rose to eleven per cent.

Even so, this figure has fallen slightly in the past few years because the increasing complexity of automotive technology and the growing percentage of electronics make much maintenance and repair work impossible without diagnostic testers or electronic test instruments. Nevertheless, the fact still remains that older vehicles

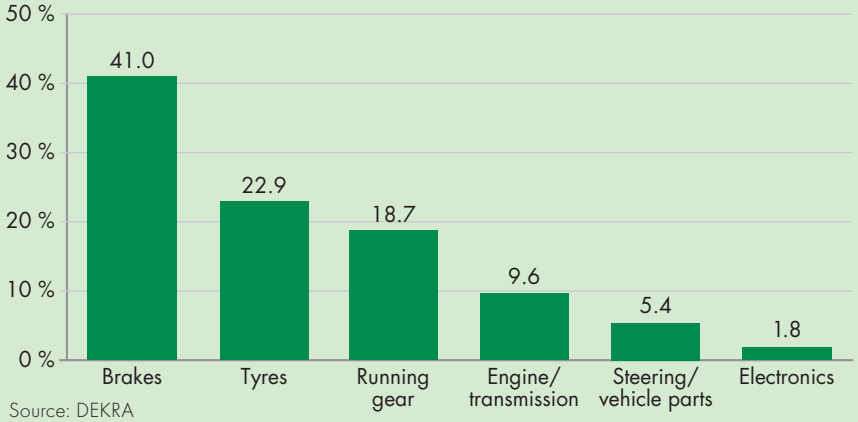
FAULTS DISCOVERED ON CARS AFTER ROAD ACCIDENTS (2002–2007)



Source: DEKRA

Details in per cent

FAULTY COMPONENT GROUPS RESPONSIBLE FOR ACCIDENTS (VEHICLES)

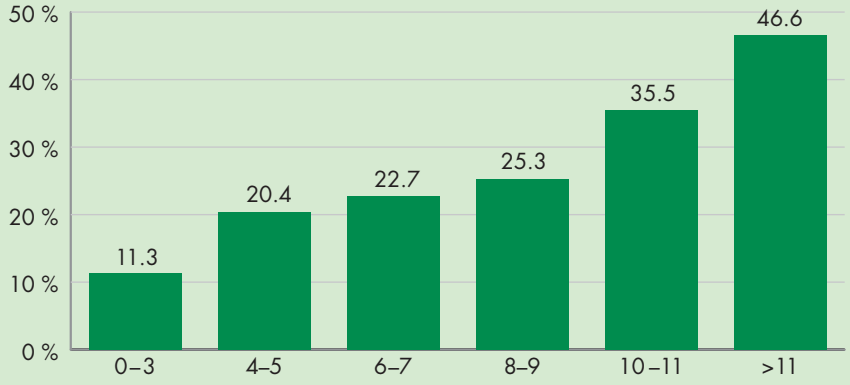


Source: DEKRA

visit a specialist workshop less frequently. While the prescribed maintenance periods are observed during the guarantee period and perhaps also during the subsequent period of good will, willingness to visit the workshop afterwards continues to fall steadily.

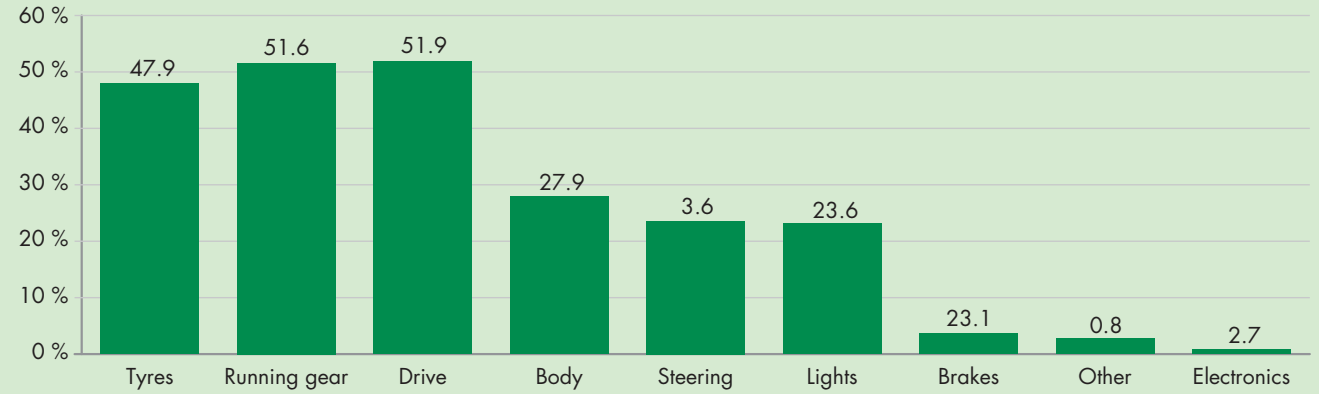
As a consequence, DEKRA appraisers were able to determine, in particular for component groups such as brake systems and tyres that by far the greatest responsibility for accident-relevant faults rests with the owners and drivers. Faults discovered on the brake systems, for example, have been traced by DEKRA experts to incorrect maintenance and thus to the owner or driver. Almost 17 per cent were caused by fitting or repair errors, of which a part could be put down to the vehicle owner undertaking his/her own repairs. During the main inspections DEKRA inspection experts also continually come across the most hair-raising examples of amateur repair work.

PROPORTION OF CARS WITH SERIOUS FAULTS EXAMINED BY DEKRA AFTER ROAD ACCIDENTS AND ANALYSED ACCORDING TO AGE GROUPS



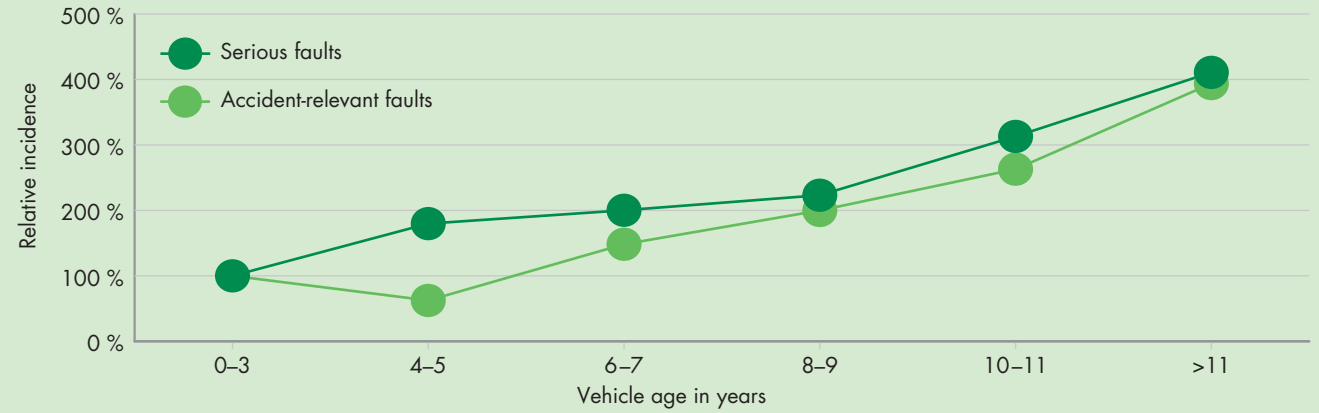
Source: DEKRA

DISTRIBUTION OF IMPERMISSIBLE MODIFICATIONS MADE TO CARS INVOLVED IN ACCIDENTS OR REVEALED BY SPOT CHECKS



Source: DEKRA

CARS WITH FAULTS DISCOVERED AFTER ROAD ACCIDENTS



Source: DEKRA

The regular technical inspection is particularly important for older vehicles as these display a significantly higher level of faults than younger vehicles.

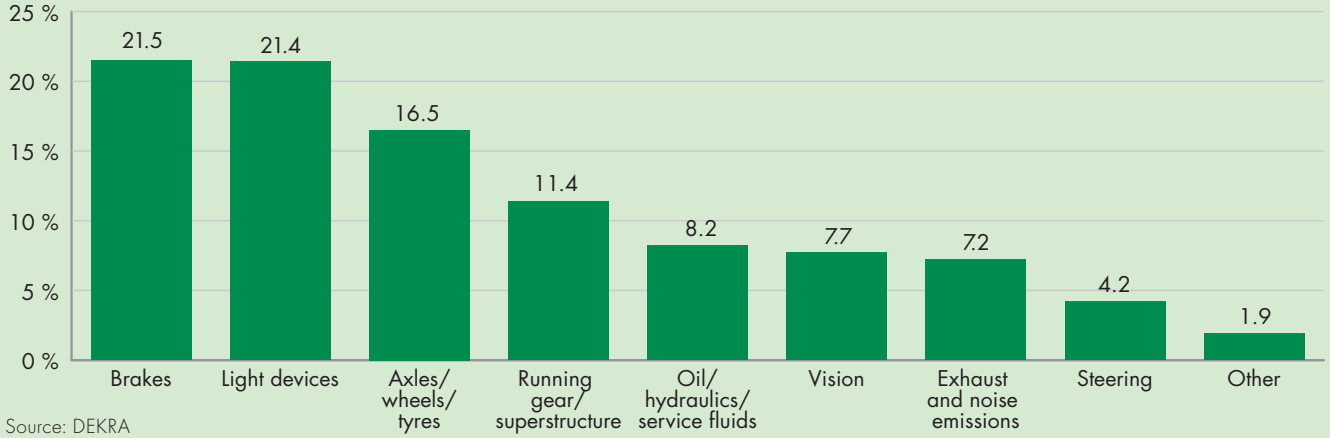
HIGH FREQUENCY OF IMPERMISSIBLE TECHNICAL CHANGES

Another "phenomenon" also regularly encountered by DEKRA experts when performing the main inspection is structural modification. Officially, these modifications are not permitted to have any negative influence on the safety of the vehicle. A modification is perfectly in order if the added or converted parts possess type approval and are correctly fitted or removed – and if the job was inspected and approved by an expert. The problems only arise when the modifications are of an impermissible nature, have not been inspected and approved, or have not been entered in the vehicle documents. A whole host of modifications fall under this category every year, as the results of main inspections conducted by DEKRA show. Main inspections in 2007 once again revealed the component group of wheels/tyres/rims (53 per cent) to be the most popular component group for receiving amateur technical modifications. It was followed by 17 per cent for the chassis, and in third place, with five per cent, the exhaust system. The other places were taken by steering, lights and bodywork.

"SAFETYCHECK" REDUCES THE RISK OF AN ACCIDENT

As virtually all statistical evaluations reveal, one age group is disproportionately involved in serious accidents on

FAULTS FOUND ON VEHICLES UNDERGOING MAIN INSPECTION IN GERMANY IN 2007 AND ANALYSED ACCORDING TO COMPONENT GROUPS



Source: DEKRA

the road - young motorists. The reasons for this can be traced, on the one hand, to the insufficient driving experience of learner drivers, and, on the other, to the fact that young motorists very often – due to their lack of financial means – drive older vehicles. Ageing, wear and the lack of awareness of technical faults as well the necessity to save money on repairs and maintenance lead to older vehicles having serious faults significantly more frequently than newer vehicles – and thus to them representing a greater accident risk.

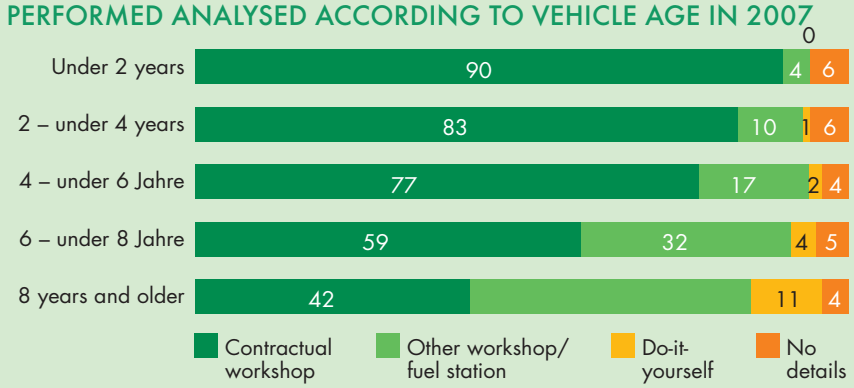
As Europe's largest technical organisation, DEKRA sees its key mission as contributing appropriate measures to change this state of affairs. As a consequence, DEKRA teamed up with the German Road Safety Council and the German Traffic Service to launch the "Safety-Check" campaign a few years ago. In 2007 the focus was placed on the phenomenon of "young drivers in old cars" and the topic pursued for the first time over a lengthy period. This campaign has given more than 14,000 young people aged between 18 and 25 the opportunity to have their vehicles inspected voluntarily and free of charge at more than 400 DEKRA centres.

The results for the vehicles inspected in Germany show that the average age of the cars inspected was amazingly high. For example, the cars the DEKRA engineers encountered were 10.8 years old on average. 77 per cent of the cars were eight years or older and the average mileage of the vehicles was 115,000 kilometres. The high age of the cars meant, of course, that virtually one half had neither driver airbag, nor ABS or ESP. The average age of these cars was 12.8 years.

During their inspections in Germany the DEKRA engineers documented at

The main inspection continues to reveal impermissible constructional modifications.

THE TYPE OF WORKSHOP WHERE MAINTENANCE WORK WAS PERFORMED ANALYSED ACCORDING TO VEHICLE AGE IN 2007



Source: DAT Report Autohaus, 2008

Details in per cent

TYPICAL FAULTS IN MODIFIED PARTS

Trailer hitch
- No registration documentation
- Ball coupling not registered

Exhaust system
- Muffler and/or exhaust system not registered or impermissible

Running gear
- No proof of permissibility of the suspension
- Use of impermissible components (springs)
- Manipulation of the running gear

Body
- Attachment of non-approved spoilers/ streamlining devices

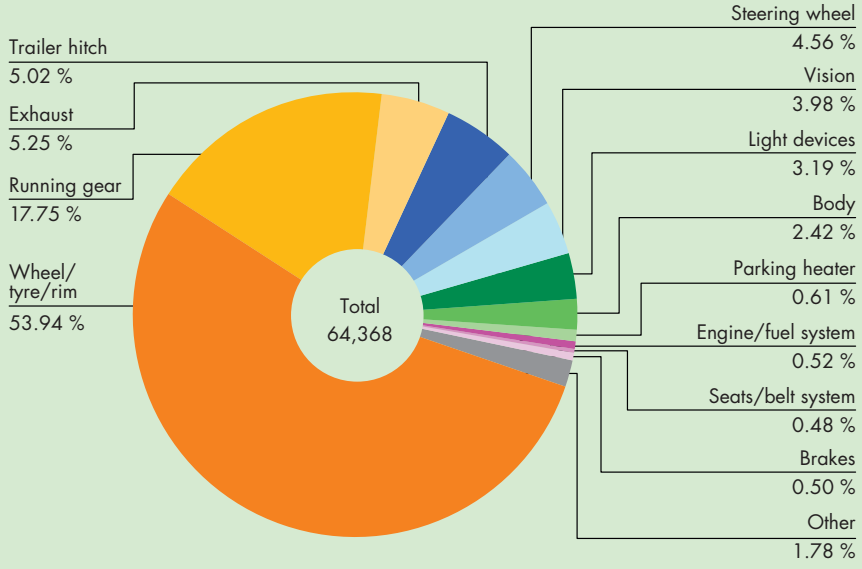
Steering wheel
- No proof of permissibility or approved design

Lights
- Attachment of impermissible lights
- Light colour stipulations not observed

Wheel/rim
- No registration documentation
- Incorrect wheel bolt/nuts
- Tyres not registered
- Tyres impermissible

Vision
- Non-approved screen toning film
- Incorrect wiper blades or outside mirrors

THE MOST COMMON COMPONENT GROUPS SUBJECTED TO UNPROFESSIONAL TECHNICAL MODIFICATIONS IN 2007



Source: DEKRA

Database car main inspection 2007

Luck alone is a poor travelling companion on the road. This is particularly true of young drivers. With them in mind DEKRA has teamed up with the German Road Safety Council and the German Traffic Service to initiate the "SafetyCheck" in order to ensure a timely detection of any vehicle faults.

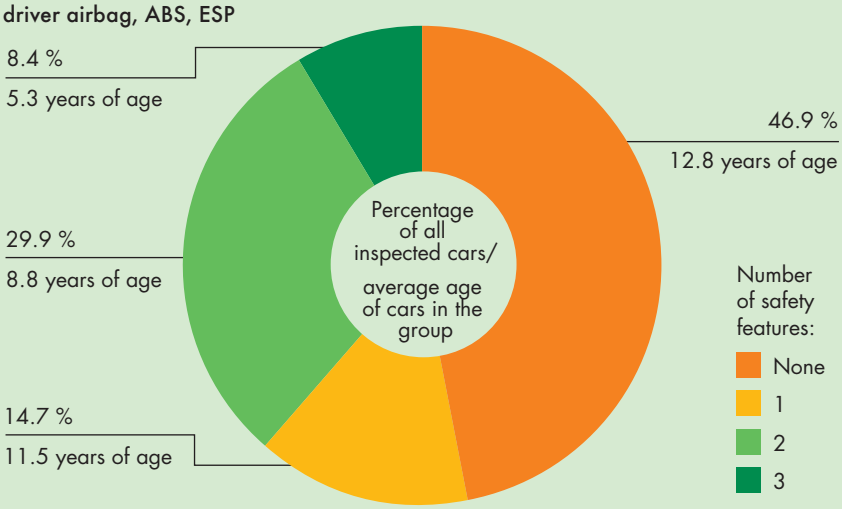
total of more than 37,000 faults, and 83 per cent of all vehicles inspected displayed an accumulation of serious faults. On average, the number of faults detected was 3.3. For each faulty vehicle, the number increased rapidly as the vehicle age rose. The percentage of faults reached almost 80 per cent for vehicles aged eight years and more.

Over 21,000 faults alone were found on safety-relevant components such as brakes, running gear and tyres. The increase in faults relating to brakes, running gear and tyres in relation to vehicle age was particularly noticeable in comparison to the other car component groups. Old brake fluid, uneven braking and low brake lining thicknesses approaching wear limits constituted almost 10 per cent (about 3,500) of all documented brake faults alone. When all is said and done,

The "SafetyCheck" gives young motorists an idea of the technical condition of their vehicle.

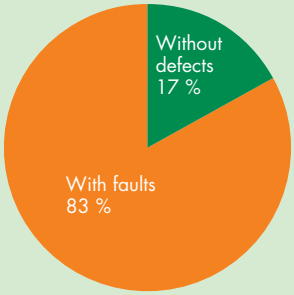
SAFETY EQUIPMENT RELATED TO AVERAGE AGE OF INSPECTED VEHICLES IN GERMANY

The "SafetyCheck" in 2007 recorded the existence of the following safety equipment: driver airbag, ABS, ESP



Source: DEKRA final report SafetyCheck, 2007.

PERCENTAGE OF INSPECTED CARS WITH AND WITHOUT FAULTS

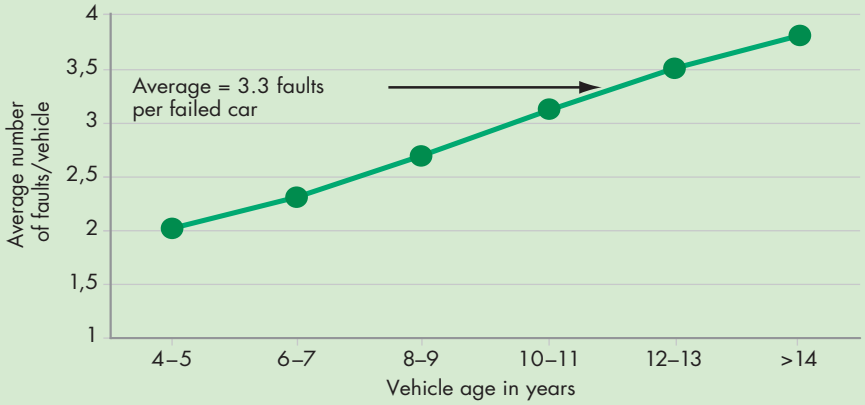


Source: DEKRA Final Report SafetyCheck 2007. Figures are for vehicles inspected in Germany

The "SafetyCheck" is carried out in Italy, too.

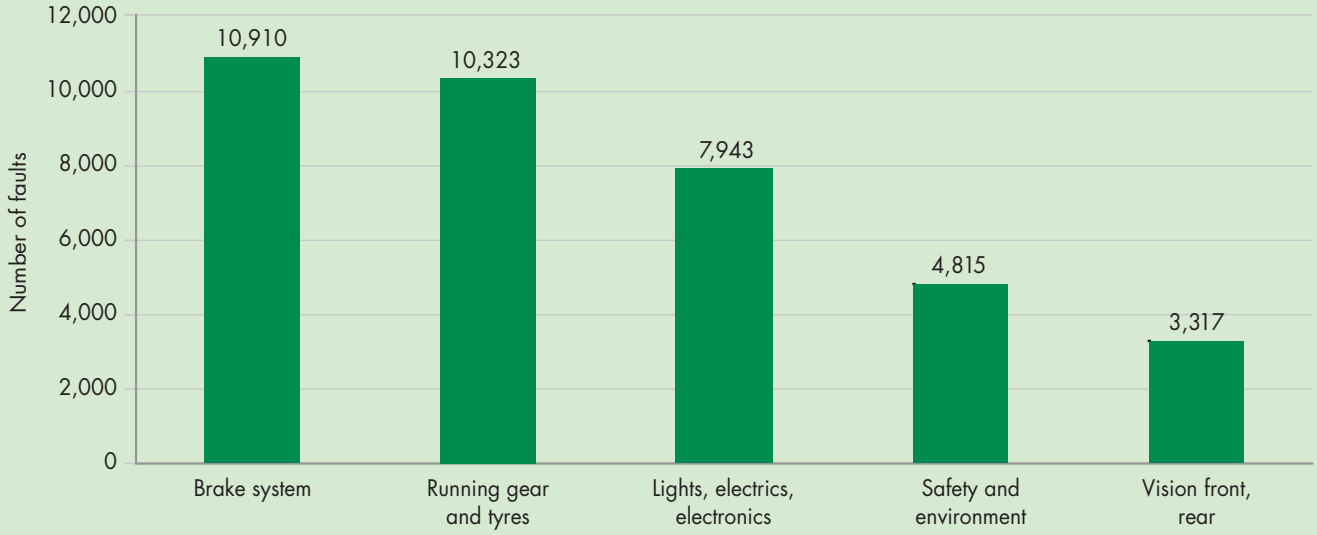
the shocking results are a clear message to DERKA and its partners to continue conducting the "SafetyCheck" campaign in the future – and not just in Germany, but also in other European countries.

AVERAGE NUMBER OF FAULTS PER FAILED CAR ANALYSED ACCORDING TO AGE GROUP



Source: DEKRA Final Report SafetyCheck 2007. Figures are for vehicles inspected in Germany

DISTRIBUTION OF DISCOVERED FAULTS FOUND IN CAR COMPONENT GROUPS



Source: DEKRA Final Report SafetyCheck 2007. Figures are for vehicles inspected in Germany (several faults possible per car)

Two striking accident examples in detail

Brake faults are by far the main accident culprit and can occasionally have devastating consequences. This is amply demonstrated by the two following examples taken from DEKRA accident analyses. The accident could have been avoided in both instances.

01 View in the direction of travel with skid marks commencing from the left-hand lane

02 Skid marks on the right-hand lane and the hard shoulder

03 Final position of the Mercedes

04 Instrument lights displaying the failure of the vehicle electronics

05 Impermissible altered chassis component to regulate suspension

06 Home-made H7 light for a xenon headlight

07 Light connected by means of a nail to the retention mount

Example 1

ELECTRONICS AND RUNNING GEAR FAULTS

Travelling at high speed a Mercedes CL 600 had to brake sharply while negotiating a gently arching left-hand bend on the motorway because of a stationary truck. Several faults caused all wheels to lock and the vehicle began to skid. It first swiped a car which was stationary on the hard shoulder and then collided with a fire service equipment truck. Following the impact, the car became wedged between this vehicle and the crash barrier.

In his report the DEKRA appraiser established that the control unit of elements governing the running gear and suspension regulation was of an impermissible type and had not been correctly modified. Furthermore, the vehicle electrics had been tampered with and caused the ABS and ESP to malfunction. The malfunctioning of the running gear management system as well as the ABS and ESP was indicated by the control lights on the cockpit display. This and the high speed at which the vehicle was travelling acerbated by a delayed reaction meant that it was no longer possible to drive the vehicle in this emergency situation even when using modern driving assistant systems. The vehicle, completely out of control, moved at high residual velocity over the lanes of the motorway in the direction of the service vehicles at the final impact point. If the running gear and electronics had not been faulty, it would have been possible to brake and steer the vehicle harmlessly past the final impact point.

Vehicle that caused the accident:

Vehicle type: ..... Mercedes CL 600

Vehicle age: ..... 7 years

Example 2

BRAKE AND RUNNING GEAR FAULTS

A BMW 3 Series model began to skid in a long gentle right-hand bend and skidded onto the opposing traffic lane where it collided with a Peugeot and a following Mercedes T Model. The collision killed the driver of the Peugeot and three occupants of the BMW. In the Mercedes, one person was seriously injured and two further passengers slightly injured.

In their report the DEKRA appraisers established that the accident had been caused by faults on the running gear and brakes of the BMW. What struck the appraisers was not only the various signs of rust under the paintwork over the entire vehicle structure, and serious faults on the suspension and shock absorbers, but in particular that the right-hand brake lining was no longer completely attached to the brake disc. The right-hand brake calliper was also very stiff, which meant that the braking force on the left-hand side of the vehicle was higher despite being subjected to the same brake pressure. The disparate braking force also contributed to the accident.

Vehicle that caused the accident:

Vehicle type: ..... BMW E30
Vehicle age: ..... 16 years

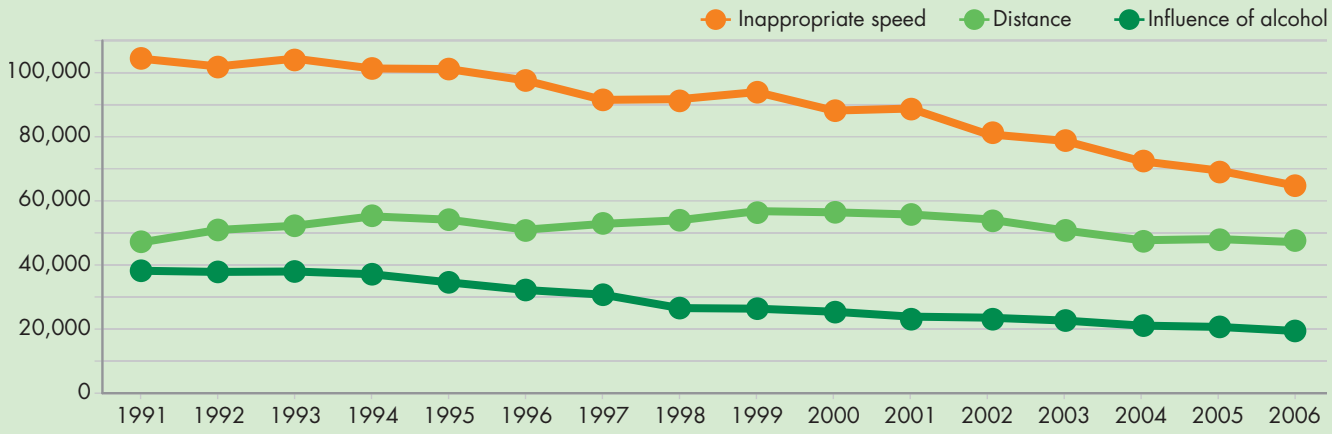
01 View in the direction of travel
02 Final position of the colliding vehicles
03 The BMW wedged into the Mercedes
04 The Peugeot after the occupants were rescued
05 Corrosion on supporting bodywork parts of the BMW
06 Brake disc broken in the accident

Dangerous risk mix

Several causes often come together to produce a road accident. Apart from inappropriate speed, alcohol, failure to maintain the correct distance to the vehicle in front, and faults on the vehicle also constitute key risk factors. Across the EU most road deaths occur in accidents on country roads.

Irrespective of which EU country is taken as an example, whether it be Germany, France, Italy, the Czech Republic, Spain or Greece – the evidence is that country roads are by far the most dangerous. Three to four times as many people die on them per billion vehicle kilometres than on the motorways. The factor of 1:3 or 1:4 is virtually uniform throughout Europe as demonstrated by the situation in Germany. Here around 60 per cent of all road deaths caused by accidents in 2006 were recorded on country roads outside urban environments while 27 per cent took place on roads in towns and 13 per cent on the motorways. There was a similar picture in Italy in 2006. Here the number of road fatalities totalled 5,669, of which 2,585 persons (45.5 per cent) lost their lives on country roads and 590 persons (10.5 per cent) on motorways. The only exceptions to the ratio cited above are Belgium and Finland, because these two countries have hardly any country roads or motorways.

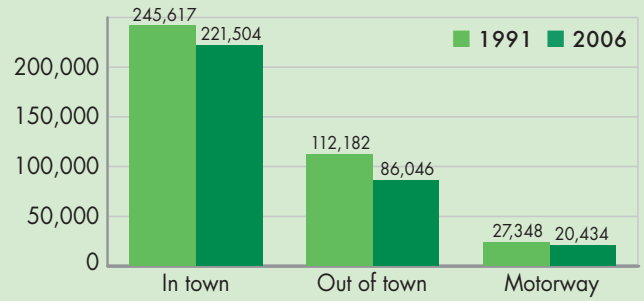
MOTORIST MISTAKES IN ACCIDENTS INVOLVING PERSONAL INJURY



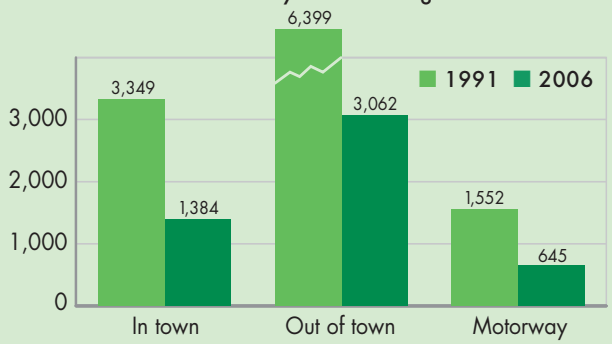
Source: Federal Statistics Office

ACCIDENTS INVOLVING PERSONAL INJURY AND FATALITIES IN 1991 AND 2006 ANALYSED ACCORDING TO LOCATION

Accidents involving personal injury analysed according to location



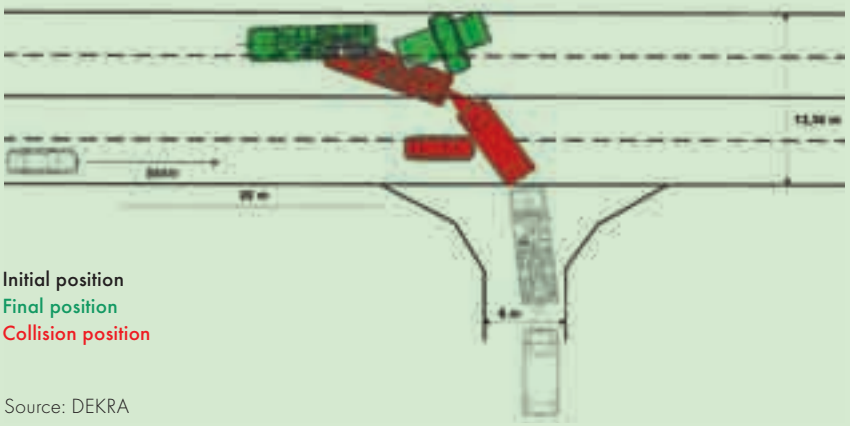
Road accident fatalities analysed according to location



Source: Federal Statistics Office

A second look at Germany in this connection also highlights another phenomenon. Only 25 per cent of accidents on country roads take place on tree-lined roads, but 36 per cent of the fatalities on country roads result from collisions with a tree. In 65 per cent of these cases the tree was a maximum of two metres from the edge of the carriageway. One solution here could be to plant new trees only at a sufficiently safe distance away from the carriageway and provide stretches of the carriageway near the trees with a crash barrier or special protective equipment.

A TYPICAL ACCIDENT ON A COUNTRY ROAD



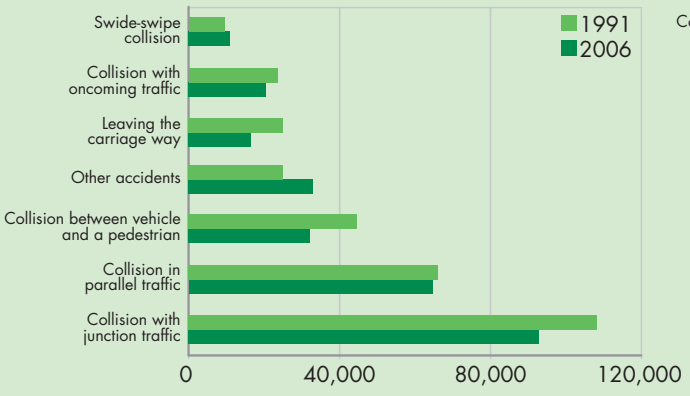
Source: DEKRA

CRITICAL TRAFFIC SITUATIONS

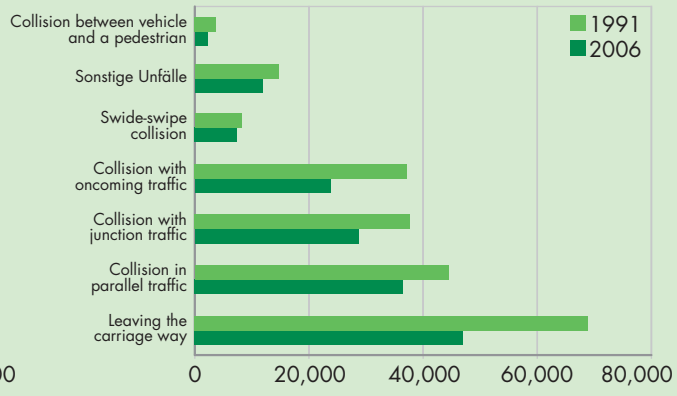
Most out-of-town accident victims in Germany in 2006 suffered injury or death when their vehicle left the carriageway. A relatively high percentage was also recorded for victims in collisions with vehicles travelling in the same direction, with vehicles crossing the driver's path and with oncoming traffic. Numerous oncoming traffic collisions on country roads take place during overtaking manoeuvres, especially before bends or rises. A high level of accident risk is also linked to taking bends at excessive speed, particularly when this is frequently followed by an inappropriate or insufficient reaction on the part of the driver during braking and/or steering actions. Active

TYPES OF ACCIDENT AND ACCIDENT VICTIMS

Accident victims in town analysed according to accident type



Accident victims out of town analysed according to accident type



Source: Federal Statistics Office

ACCIDENTS ANALYSED ACCORDING TO LOCATION

Figures from 2005	Road accidents involving personal injury			Killed		
Land	In town (%)	Out of town (%)	Total	In town (%)	Out of town (%)	Total
Belgium	56.4	43.6	49,286	28.6	71.4	1,089
Denmark	52.3	47.7	6,919	28.7	71.3	331
Germany	67.1	32.9	336,619	27.4	72.6	5,361
Finland	52.5	47.5	7,020	26.6	73.4	379
France	69.4	30.6	84,525	31.3	68.7	5,318
Greece	78.9	21.1	16,914	45.7	54.3	1,658
Ireland	53.3	46.7	5,985	26.6	73.4	335
Italy	75.7	24.3	224,553	41.1	58.9	5,625
The Netherlands*	65.5	34.5	27,013	35.3	64.7	750
Austria	61.5	38.5	49,286	26.2	73.8	768
Poland	71.3	28.7	48,100	45.8	54.2	5,444
Portugal	69.3	30.7	37,066	43.1	56.9	1,247
Sweden	53.5	46.5	18,094	25.0	75.0	440
Slovenia	56.8	43.2	10,509	31.0	69.0	258
Spain	53.3	46.7	91,187	17.8	82.2	4,442
Czech Republic	62.0	38.0	25,239	39.1	60.9	1,286
Hungary*	68.0	32.0	20,777	39.3	60.7	1,278
United Kingdom	63.8	36.2	203,682	33.4	66.6	3,336

*Figures from 2004 Source: IRTAD

safety systems such as the electronic stability programme ESP help to prevent an accident in such a situation. Naturally only within physical limits, ESP helps the driver to keep the vehicle on the road and thus avoid collisions with oncoming traffic – or prevent the vehicle leaving the carriageway and possibly followed by a rollover or impact against a tree, for example.

Moreover, critical road situations on the country roads again and again involve an oncoming truck with a trailer turning left. The car driver usually perceives the truck manoeuvre too late, but thinks that the truck will have left its lane in time to leave a clear passage. The trailer is frequently noticed only when it is too late, and the combination of truck and trailer blocks the entire carriageway. If a car driver observes the speed limit on a country road, accidents in this situation can usually be avoided, but many motorists often drive at too high a speed in these circumstances.

DRINK-DRIVING

One of the greatest safety risks on the road continues to be driving under the influence of alcohol. In Germany in 2006 there were 20,685 accidents in which at least one accident participant was under the influence of alcohol. 599 people died (twelve per cent) as a result of an alcohol-related accident, 7,564 persons (ten per cent) were seriously injured and 18,733 people (5.4 per cent) were slightly injured. The situation in France is even more serious; here no fewer than 1,043 people in 2006 died in alcohol-related accidents. This corresponds to over 22 per cent of all road fatalities. A majority of the drivers had a significantly higher alcohol concentration in their blood than the statutory minimum 0.5 parts per thousand (ppt). In Germany in 2006, 83.5 per cent of drivers were found to be under the influence of alcohol. The actual number is, however, probably much higher as breathalyzer checks do no cover all motorists and blood samples are usually only taken after an accident in which there is a suspicion of alcohol consumption. The most common age group for drink-drivers in Germany in 2006 was the 25 – 35 year olds, in France the 25 – 44 age group.

DULLED SENSES

Numerous studies have proven that an alcohol concentration of over 0.4 ppt in the blood, leads to an increase in the

incidence of accidents. From 0.8 ppt, the likelihood of becoming involved in an accident rises rapidly and exponentially and at 1.5 ppt is sixteen times greater than at 0.0 ppt. A motorist is prepared to take more risks, suffers a reduction in the acuteness of his vision and has problems judging distances with as little as 0.3 ppt. From 0.5 ppt the ability to react deteriorates significantly; from 0.8 ppt the first co-ordination problems appear along with tunnel vision and perceptible disinhibitions. At 1.1 ppt speech becomes slurred and the willingness to take risks and show aggression rises greatly. Furthermore, it must be considered/remembered that alcohol in the blood dissipates only very slowly (at about 0.1 ppt an hour). This means that after heavy drinking at night, residual alcohol is frequently still present in the blood the following morning.

A measure to prevent driving under the influence of alcohol much under discussion recently here and also increasingly throughout Europe consists of breath-alcohol-sensitive ignition locks, also called alcohol interlocks or alcolocks for short. It is a breathalyser device connected to an immobiliser. The driver has no option but to give a sample of his breath before driving off. If the device detects that the driver is alcoholised, the vehicle cannot be started. All test requirements, results of breath tests, operation errors and attempts at manipulation are recorded in the device's memory and can be read off and evaluated via a special program. Alcolocks are principally intended as a rehabilitation measure for previous offenders (secondary prevention), but have also been discussed as a generally preventative road safety measure for people who drive for a living (primary prevention).

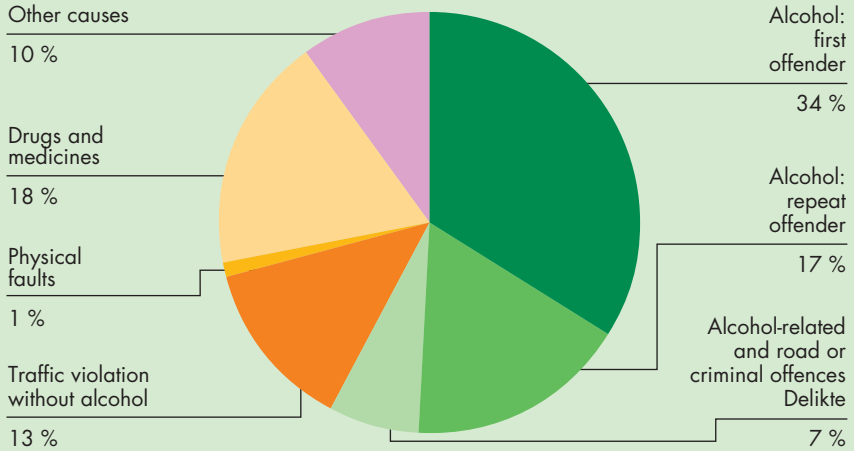
In 2006 in Germany most road deaths resulted from accidents taking place on country roads.

MORE BREATHALYSER TESTS REQUIRED

To provide a countermeasure and to reduce the number of serious alcohol-related accidents, lower permissible limits, tougher punishments and special training programmes are no doubt a sensible option. The alcohol ban for learner drivers which came into force in Germany on 1st August 2007 has already greatly reduced the accident risk for this age group. However, above all else, more roadside police checks are called for. This is because, however sensible the regulation is, it is useless if its

Alcohol or drug consumption seriously impairs the senses of the driver on the road.

DISTRIBUTION OF THE CAUSES OF MPE*-EXAMINATIONS IN 2006



Source: Federal Institute for Road Research

*Medical and psychological examinations (MPE)

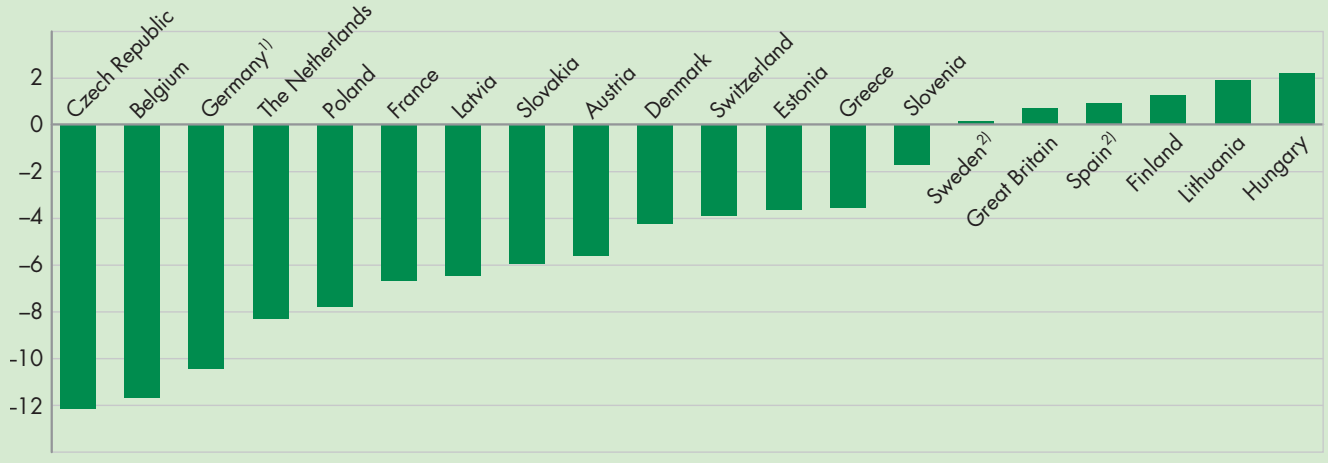
More roadside police checks could significantly decrease the number of alcohol-related accidents.

observance is not properly monitored. In countries such as Finland, Sweden, France, Greece, Slovenia and the Netherlands the number of roadside checks is already particularly high. Cyprus provides an example of how an increase in roadside checks constitutes a successful supportive measure to enforce the maximum alcohol limit. Cyprus doubled the number of breathalyser checks per capita between 2004 and 2005 – and this together with a reduction of the permissible amount of alcohol in the blood led to a fall in violations.

DRUG-DRIVING ON THE INCREASE

While the traffic safety risk that alcohol represents has been the subject of intensive research for decades, there is still little known about how the consumption of illegal drugs impacts on the level of accident risk, i.e. in relation to the substance concentration in blood and the frequency of consumption. At least as far as Germany is concerned, driving under the influence of drugs is generally forbidden. Violations are punished in the

ALCOHOL-RELATED ROAD DEATHS IN EUROPE EXPRESSED AS PERCENTAGE CHANGE

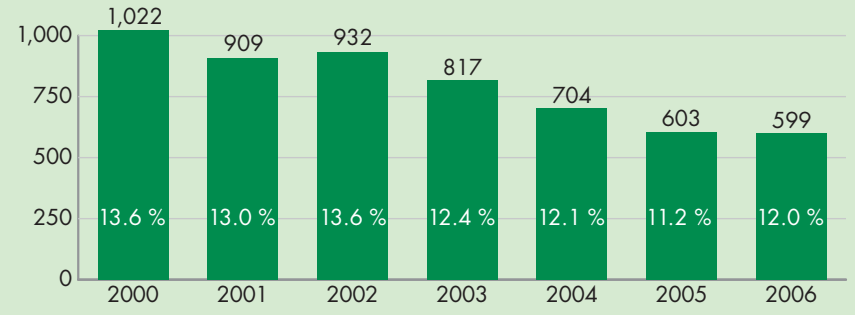


Source: European Transport Safety Council

1) Annual percentage change of drivers involved in fatal alcohol-related accidents
2) Annual percentage change of drivers involved in alcohol-related accidents in which the driver was killed

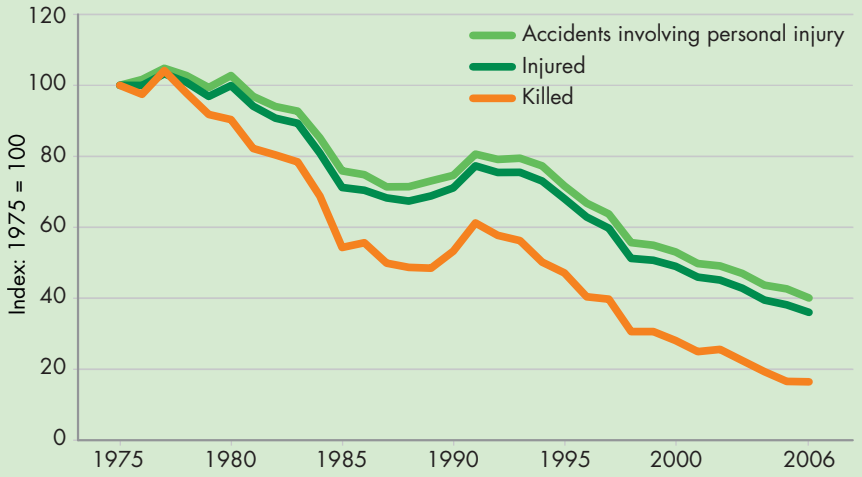
ROAD USER FATALITIES

Accidents involving the influence of alcohol on the road in Germany (with percentage ratio for all fatalities on Germany's roads)



Source: Federal Statistics Office

ALCOHOL-RELATED ROAD ACCIDENTS*



*Accidents in which at least one of the persons involved was under the influence of alcohol
Source: Federal Statistics Office

same way as drink driving with above 0.5 ppt. Proven consumption of even a small amount of illegal drugs can entail fines, loss of driving licence and prosecution in accordance with the Narcotics Act.

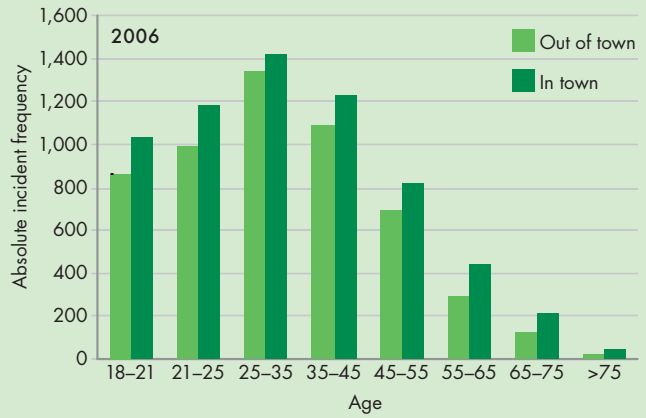
The fact is that the statistics published by the police and the Federal Institute for Road Research show that drug-related accidents have risen significantly in Germany. In addition, a representative survey conducted in 2000 on the use of psycho-active substances among adults in Germany showed that around three million people smoke cannabis. Of this figure, eleven per cent consumes cannabis daily and at least 33 per cent at least twice a month. The figures have probably increased in the meantime.

In terms of road safety, the use of cannabis has especially grave consequences. For example, it can lead to a massive impairment of performance as regards the perception of time, the visual and acoustic senses as well as the ability to react and concentrate. It also causes problems of motor co-ordination, a delay in reaction and decision-making time (for instance, misjudging the time required to perform an overtaking manoeuvre), impairment of the traffic-relevant sense of hearing, difficulties in distinguishing differences in colour, impaired recognition of central and peripheral light signals and the details of moving objects as well as impairments to the acuteness of dynamic vision for moving objects as well as spatial awareness.

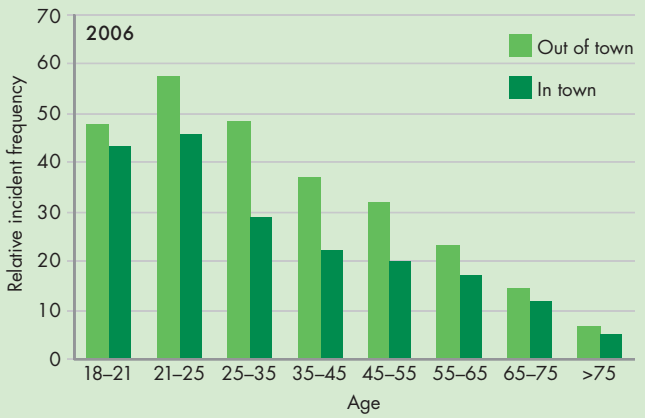
There are several ways of preventing drug-related accidents. Recommendations include preventative work in school, road safety education measures (involving

DRINK-DRIVING

Drink-drivers are most prevalent among the 25 – 35 age group.

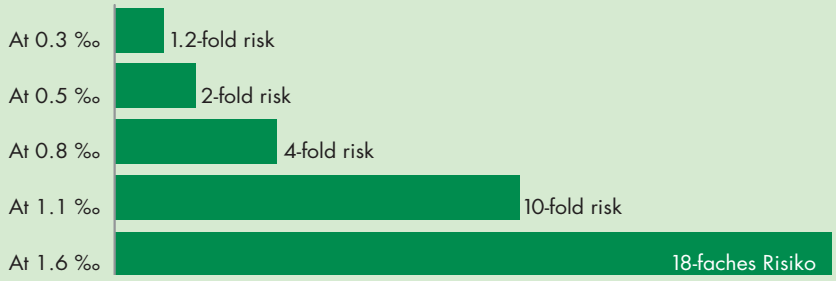


Per 1000 accidents the people most likely to drive under the influence of alcohol were found in the 21 – 25 age group.



Source: Federal Statistics Office

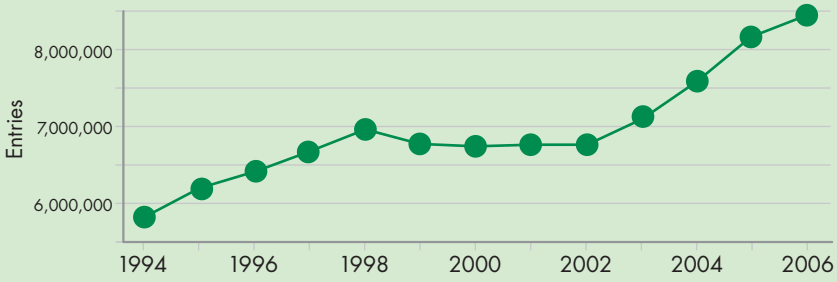
FREQUENCY OF ALCOHOL-RELATED ACCIDENTS INCREASES WITH ALCOHOL INTAKE



Source: Federal Institute for Road Research

VIOLATION ENTRIES MADE BY THE FEDERAL OFFICE FOR MOTOR VEHICLE TRAFFIC

People/Individuals entered in the Centralised Traffic Violation Register on 1st January 2007



- 6.7 million (79.9 per cent), of which are men (2006)
- 58.7 per cent on account of excessive speed, 12.9 per cent due to drink-driving (2006)

Source: Federal Office for Motor Traffic

parents), expansion and improvement of driving school instruction, likewise more police roadside checks as well as better utilisation of the legal sanctions already existing to punish such behaviour. Apart from carrying out training programmes for drug-offending motorists, more research still needs to be invested in this area.

TRAFFIC-RELATED PSYCHOLOGICAL AND MEDICAL ADVICE SHOULD BEGIN EARLIER

Incidentally, according to the Federal Institute for Road Research reporting on Germany in 2006, a drink-driving offence (58 per cent) was the main reason why participants underwent a medical and psychological examination (MPE) in order to re-acquire driving competence. The incidence of drug and medication consumption rose by eleven per cent on the previous year. This situation is reflected by the fact that there has been a continuous rise in the number of entries in the centralised traffic violation register in Flensburg since 2002. On 1st January 2007 73,000 driving licence holders with more than 14 penalty points were registered there, of whom around 10,000 had more than 17 penalty points, and were, therefore, on the verge of having their driving licence revoked.

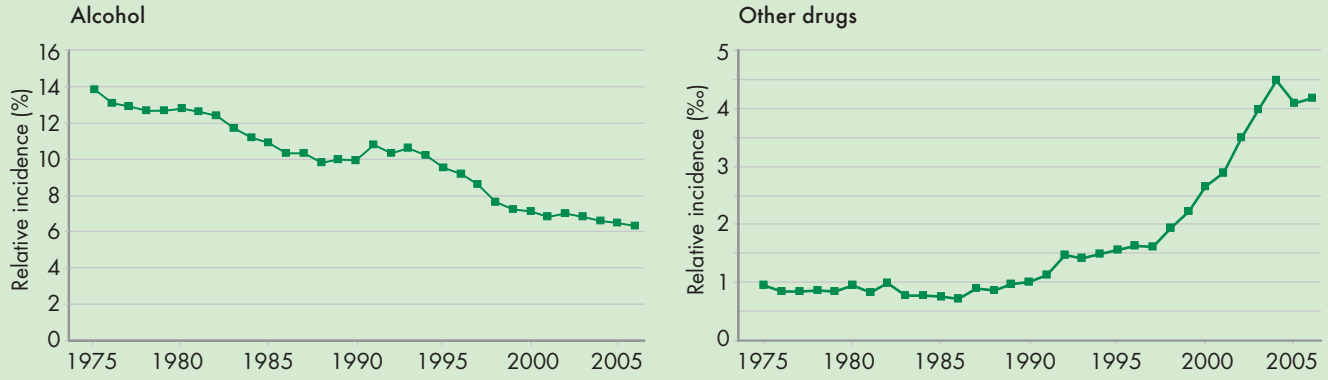
In light of this, traffic-related psychological and illness-related medical consul-

DRIVING UNDER THE INFLUENCE OF ALCOHOL AND DRUGS

The official statistics show that of those drivers with alcohol in their blood 70% had a blood/alcohol concentration of 0.8 ppt and more. That's 9,405 of the total of 11,560 persons with alcohol in their blood. 83.5% of the drink-drivers had a blood/alcohol concentration of more than 0.5 ppt (10,770 of 11,560 drivers).

Since the re-unification of Germany the percentage of motorists driving under the influence of other drugs has increased from about 1% in accidents involving personal injury to more than 4%. In France it is estimated that 2.5% of fatal accidents could have been prevented if the driver had not taken cannabis.

In the same period the percentage of alcohol-related accidents in Germany fell to 60% of the 1991 figure. (2006: 6.3 % of all accidents involving personal injury. 1991: 10.8 % of all accidents involving personal injury.



Source: Federal Statistics Office 2006

A beer too many is all too often a life-and-death decision.

tation should be introduced earlier and as soon as possible after the offence has been committed. The German Association for Road Traffic Psychology (Deutsche Gesellschaft für Verkehrspyschologie e.V. (DGVP)) also recommends subjecting all measures which, under the current points system, entail legal consequences (motivational system with point reductions such as, for example, seminar participation, special seminars or traffic-related psychological consultancy) to an efficacy analysis.

Consequently, it is proposed to allow people who have up to seven penalty points in the centralised traffic violation register to avail themselves of traffic-related psychological consultancy in accordance with Section 4, Sub-section 9 of the Road Traffic Law. The reduction could be increased to three penalty points as motivation. Offenders with eight points or more in the centralised traffic violation register should still be able to take advantage of traffic-related psychological consultancy, but without enjoying a penalty

LEGAL BLOOD/ALCOHOL LIMITS IN EUROPE 2007

Country	Blood/alcohol concentration in %	Special blood/alcohol limits for learner drivers, professional drivers etc. in %
Austria	0,5	0.1 for people in the probationary period that have held their driving licence for less than two years
Belarus	0,0	No
Belgium	0,5	No
Bosnia-H	0,5	No
Bulgaria	0,5	No
Croatia	0,0	No
Cyprus	0,5	No
Czech Republic	0,0	0.0 for professional drivers
Denmark	0,5	No
Estonia	0,5	No
Finland	0,5	No
France	0,5	0.2 for bus drivers
Germany	0,5	0.0 for learner drivers in the probationary period or under 21 years of age, scheduled bus, taxi and hazardous goods drivers.
Greece	0,5	0.2 for motorcyclists and drivers of commercial vehicles as well as for people that have held their driving licence for less than two years
Hungary	0,0	No
Ireland	0,8	No
Island	0,5	No
Italy	0,5	No
Latvia	0,5	0.2 for people who have held their driving licence for less than two years
Liechtenstein	0,8	No
Lithuania	0,4	No
Luxembourg	0,8	No
Macedonia	0,5	0.0 for professional drivers
Malta	0,8	No
Montenegro	0,5	0.0 for professional drivers
Norway	0,2	No
Poland	0,2	No
Portugal	0,5	No
Rumania	0,0	No
Serbia	0,5	0.0 for professional drivers
Slovakia	0,0	No
Slovenia	0,5	0.0 for professional drivers
Spain	0,5	0.3 for people that have held their driving licence for less than two years, for drivers of motor vehicles with more than 8 seats as well as professional drivers
Sweden	0,2	No
Switzerland	0,5	No
The Netherlands	0,5	0.2 for people who have held their driving licence for less than five years and for drivers of small motorcycles under the age of 24
Turkey	0,5	0.0 for drivers of (all) trailer combinations, including trucks and buses
United Kingdom	0,8	No

Fines similar to those for alcohol offences are imposed in many countries for "drug-driving"; these may additionally involve consequences for the driving licence and entail periods of imprisonment. Source: ADAC

Drivers who exceed the speed limit or stay too close to the driver in front can be detected by radar systems working within appropriate tolerances.

point reduction any longer. According to the DGVP, this would create a system of incentives which would be more likely to encourage people to adopt changes in their driving behaviour.

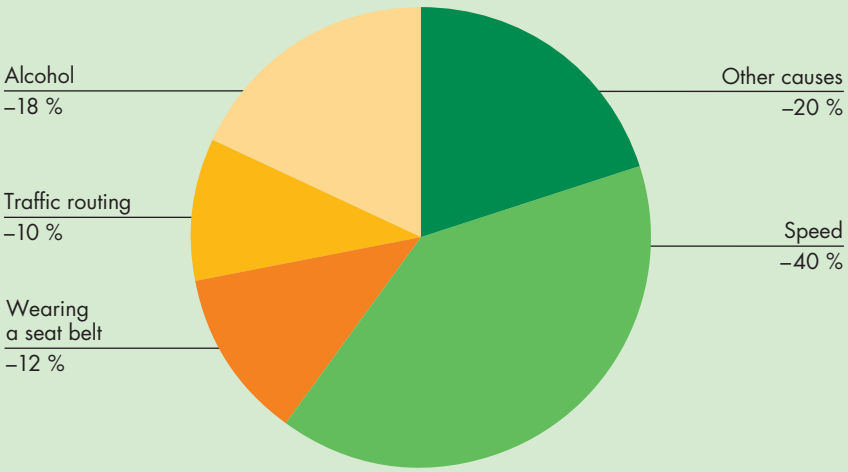
SPEED MANAGEMENT MORE EFFECTIVE THAN SPEED LIMITS

In all EU countries the most common accident cause is not alcohol but inappropriate speed. In Germany in 2006 almost one in five accidents as well as 43 per cent of all road fatalities and 21 per cent of all injuries could be traced to excessive speed. A comparison with the average number of accident victims as a percentage of all accidents involving personal injury also shows that speed-related accidents have disproportionately serious consequences. According to the Federal Statistics Office, in 2006 there were 16 fatalities, 227 seriously and 1,061 slight injuries per 1,000 accidents involving personal injury. For every 1,000 accidents in which inappropriate speed was a contributory factor, there were 34 fatalities, 339 seriously injured and 1,036 slightly injured. This means that the risk of dying in a speed-related accident is twice as high as the average for all accidents involving personal injury.

In this connection, the introduction of speed limits on motorways is a constant source of debate. High speed differentials as well as lengthy braking paths and high energy potential at high speeds are physical factors which speak in favour of a speed limit. This is countered, however, by the actual accident situation.

CAUSES OF LOWER LEVEL OF FATAL ACCIDENTS

The fall in the number of road deaths in France of 21 per cent in 2003 can be traced to various causes.



Source: European Transport Safety Council

Motorways, in relation to overall mileage covered, are easily the safest road ways in Germany. Whereas, for example, about 8.4 persons died on all Germany's roads per billion vehicle kilometres in 2005, the motorway figure was only 3.2 persons. Also, in an international comparison of roads of the same quality, the Germany motorways display a very high level of safety. The cited rate of 3.2 puts Germany clearly behind Great Britain (1.7), and Switzerland (2.5), but, for instance, ahead of Austria (6.7) and Finland (3.4).

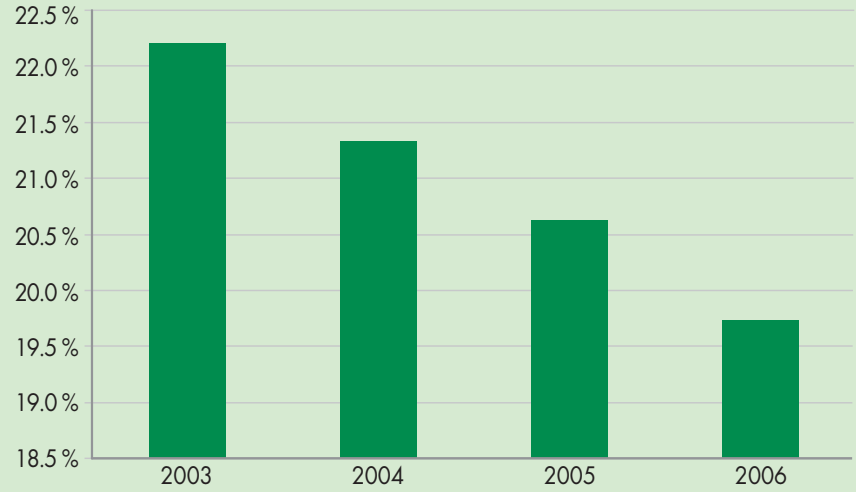
SERIOUS ACCIDENTS AT ROAD WORKS

In November 2006 the EU Commission presented a consultative report on an improved implementation of the traffic regulations. It came to the conclusion "that a reduction in the average speed leads to a reduction of the incidence and also the severity of accidents." The EU Commission went on to state that the most important findings of science and research indicate "that a specific speed restriction would lead to a fall in the number of accidents involving property damage by a factor of one, a fall in the number of accidents involving personal injury by a factor of two, and a reduction in the number of fatal accidents by a factor of four."

In contrast, the experience of DEKRA Accident Research shows that the severity of a motorway accident does not necessarily increase at higher speeds. In fact the opposite is true – low speeds lead to an increase in serious accidents. This can be explained by the heightened accident risk occasioned by greater traffic density and road works.

INAPPROPRIATE SPEED

Percentage of accidents caused by inappropriate speed in relation to all accidents involving personal injury.



Source: Federal Statistics Office

Statistics also reveal that road works present a heightened risk of accident occurrence.

Traffic management systems can help lower the risk of accidents.

USE OF TRAFFIC MANAGEMENT SYSTEMS

As a result of the above findings the argument for a blanket speed limit is weak – road sections possessing a high degree of accident risk are speed restricted any way. It is rather the case that an intelligent speed management system must be employed to match the speed variably to traffic density, weather conditions, condition of the road and also the environmental protection requirements. The more constant the traffic flow can be kept, the lower the fuel consumption and thus the amount of exhaust gases and CO^2 emissions. Otherwise, in the cases of vehicles driving too close behind the vehicle in front, frequent lane changes and the resulting speed differences cause an increase in pollution and the formation of traffic jams – which also increases the risk of an accident quite considerably.

A fixed speed limit can be an effective tool here. Moreover, it is not possible to respond to traffic jams at subsequent road sections by a targeted reduction in speed because the impact of weather conditions has been completely overlooked. A quick response cannot be made in sections of road suddenly subject to fog, black ice or increased aquaplaning risk.

In contrast, the employment of traffic management systems with variable speed displays in combination with stricter roadside checks for speed and safety dis-

ACCIDENTS ON EUROPE'S ROADS IN 2005

Country	Speed limit km/h	Motorway kilometres	Killed				Mileage (in million vehicle kilometres)			Killed (per billion vehicle kilometres)			
	Motorway	Motorway	All roads	Motorway	Country roads	CR/MW*	All roads	Motorway	Country roads	All roads	Motorway	Country roads	CR/MW*
Austria	130	1,677	768	92	249	2.71	82,221	19,003	16,705	9.3	4.8	14.9	3.08
Belgium	120	1,747	1,089	158	115	0.73	94,677	32,826	32,836	11.5	4.8	3.5	0.73
Czech Republic	130	542	1,286	45	381	8.47	50,262	6,259		25.6	7.2		
Denmark	130	1,278	331	31	69	2.23	47,940	12,151	7,066	6.9	2.6	9.8	3.83
Finland	120	653	379	10	148	14.80	51,675	5,417	9,173	7.3	1.8	16.1	8.74
France	130	10,485	5,318	324	847	2.61	552,800	122,000	96,100	9.6	2.7	8.8	3.32
Germany	none	12,174	5,361	662	1,238	1.87	684,283	216,200	107,300	7.8	3.1	11.5	3.77
Greece	120	742[4] [6]	1,658	111	431	3.88	81,635			20.3			
Hungary[1]	130	575[1]	1,278	47	444	9.45		4,154	12,384		11.3	35.9	3.17
Poland	130	551	5,444	32			377,289			14.4			
Portugal	120	883[5]	1,247	98	120	1.22							
Slovenia	130	569	258	25	60	2.40	15,519	3,336	2,025	16.6	7.5	29.6	3.95
Spain	120	9,910[3] [6]	4,442	219			665,636			6.7			
Sweden	110	1,700	440	24			75,196			5.9			
The Netherlands[1]	120	2,274[4]	750	130			133,800	56,385	23,280	5.6	2.3		
United Kingdom	112	3,748	3,336	206			499,396			6.7			

Figures from [1] 2004 [2] 2003 [3] 2002 [4] 2001 [5] 1999 [6] Eurostat, *CR/MW: the ratio of fatalities on country roads to motorway fatalities Source: IRTAD

The seat belt is essential in the back seat as well.

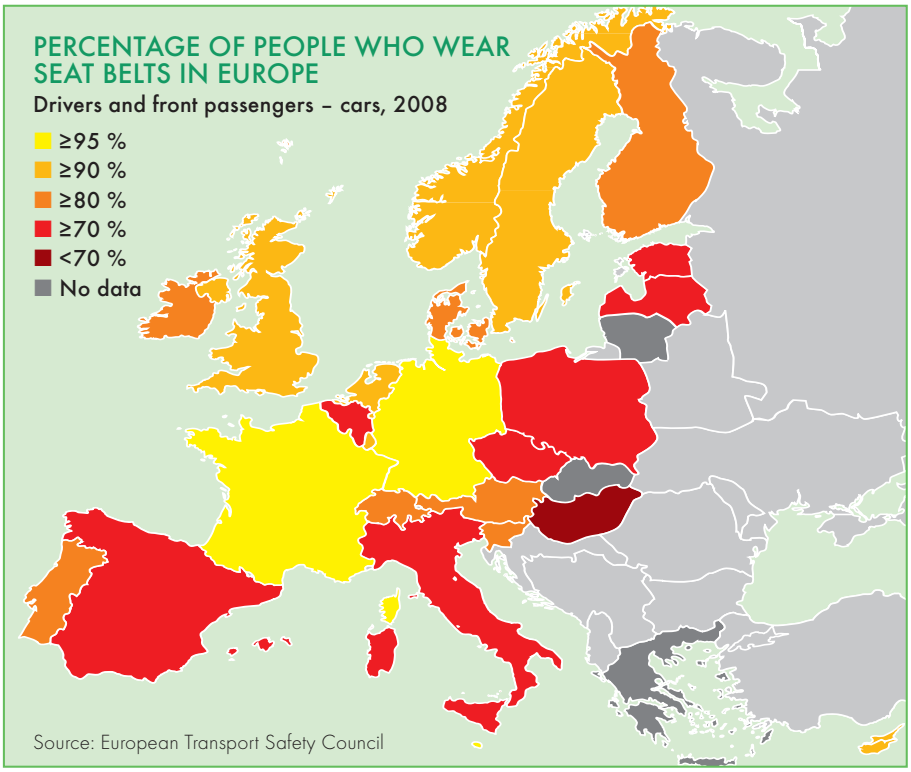
tance constitute a measure that is far more effective at further minimising the risk of accidents as well as improving the ecological balance, reducing the costs to the economy caused by traffic jams and cutting the negative effects of noise levels on people's health.

THE SAFETY BELT IS A LIFE-SAVER

Irrespective of the speed at which the vehicle is travelling, the use of the safety belt still remains the most important way for vehicle occupants to greatly reduce the risk of serious injury. Current studies show that 45 per cent of fatalities and 35 per cent of other (non-fatal) injuries can be prevented by wearing a seat belt. For instance, the Germany In-Depth Accident Study, GIDAS, a joint venture between the Federal Institute for Road Research and the research association Automobiltechnik e.V., revealed that a car occupant not wearing a seat belt has approximately a seven times greater risk of suffering fatal injuries as a car occupant wearing a seat belt. This means that if everybody wore a seat belt 17.8 per cent of fatal injuries sustained by car occupants could have been avoided. This corresponds to 478 occupants of the 2,683 car occupants killed in road accidents in Germany in 2006. Considering that every road death costs the national economy in Germany an average of 1.16 million euros, the damage to the national economy is 545 million euros.

The fact that the EU made the wearing of seat belts in cars mandatory in 1991 and for all vehicle classes from May 2006 has made a significant contribution to lowering the number of road deaths. The EU estimates that around 11,000 motorists survived a serious road accident in 2005 because they wore a seat belt. Meanwhile, the percentage of people wearing seat belts in many EU countries remains constantly high. In Germany and France the figure for all roads is currently between 90 and 100 per cent, for motorways alone 98 per cent. The development in the Czech Republic is also interesting. There the number of people wearing a seat belt has grown between 2001 and today from 81 per cent (motorways), 61 per cent (country roads) and 43 per cent (urban driving) to 97 per cent, 88 per cent and 90 per cent respectively.

An absolute must: the right way to secure children.



MANY CHILDREN INCORRECTLY SECURED

Overall, the percentage of people wearing a seat belt in the back seat is significantly lower in almost all EU countries. In France in 2005 the "1st Road Safety PIN Report" of the European Transport Safety Council recorded this quota as 70 per cent, while in Spain it was only 50 per cent and in Hungary just a little over 30 per cent. It is a false sense of security to feel safe and not don a seat belt simply because you are sitting in the back seat. People sitting in the back seat without a seat belt have between two and two and half times more risk of sustaining serious injuries in an accident than those wearing seat belts.

Although the number of children wearing seat belts has increased noticeably in the past few years, there is still a great deal of room for improvement here – especially as the risk of unsecured children sustaining fatal or serious injury is seven times greater than that of an adult. Various studies also demonstrate that child retention systems are frequently incorrectly used. In Switzerland and in Germany around 60 per cent of all

children are incorrectly secured in their cars. This figure could be greatly reduced by investing more time and effort in explaining to users the consequences of incorrect use.

Incidentally, the life-saving significance of the safety belt has been also amply demonstrated in crash tests conducted by DEKRA and AXA Winterthur Versicherung. These show that the safety belt provides the greatest protection in frontal collisions. Even a relatively low speed enormously increases the risk of injury to occupants not wearing a seat belt The impact energy at 50 km/h is comparable to that of a fall from the fourth floor of a building. The belt also considerably reduces the risk of injury in rollover accidents. Occupants not wearing a seat belt can be catapulted from the car more easily and are thus more likely to sustain injury and fatal injuries than those wearing belts.

THE COMBINED EFFECT OF AIRBAG AND SAFETY BELT

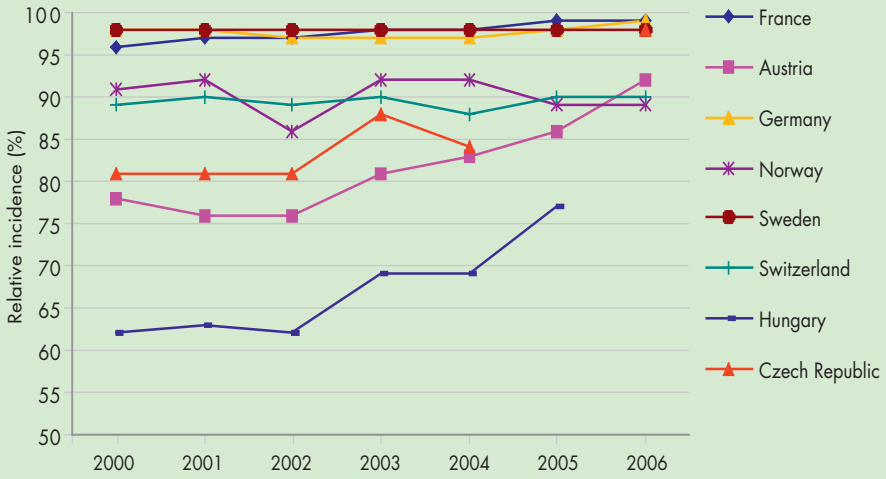
New belt concepts involving an intelligent tightening of the belt are even more capable of protecting occupants during a side-on collision than before. It effectively prevents the upper body from slipping out of the belt and consequently provides even better protection for the occupants. Interesting in this connection is the combined effect of safety belt and airbag. A study by the German Insurance Association (GDV – Gesamtverband der Deutschen Versicherungswirtschaft) revealed that both components working in tandem reduced the risk of a serious injury or fatal injury during an accident by 65 per cent. This figure increases still further for a head-on collision. Belt systems are linked to the airbag and they work together effectively. The belt tensioner is activated at even low collision speeds. Only when the accident loading increases still further is the airbag triggered as an additional protective measure.

While the airbag in combination with the belt reduces the risk of injury during an accident considerably, it can represent a risk to an occupant not wearing a belt due to its high inflation speed of about 200 km/h. Additionally, there is the risk that the impact force of the airbag sends the occupant not wearing the seat belt onto the instrument panel or the steering wheel. Effective accident protection therefore assumes that the safety belt is also worn in vehicles fitted with an airbag. Only by co-ordinating the individual safety features with each other can optimal protection of the vehicle occupants be ensured.

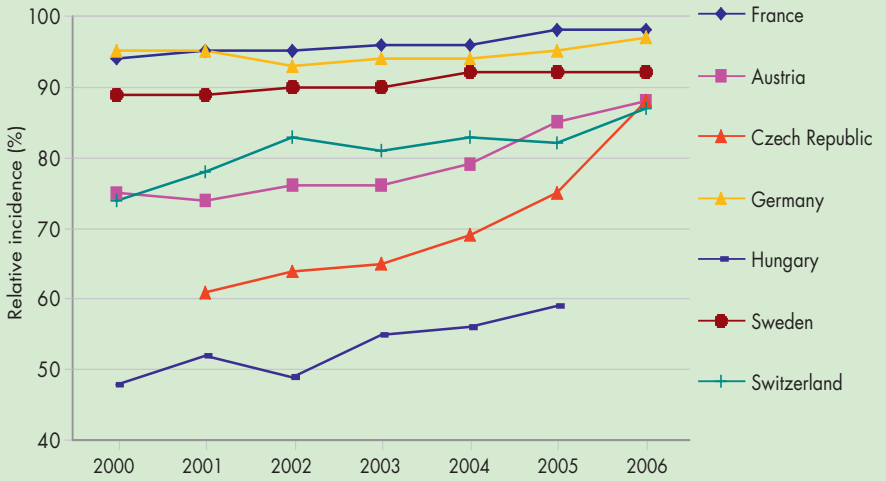
WEARING A SEAT BELT

For years now the number of car drivers who wear a seat belt has been relatively high in many European countries.

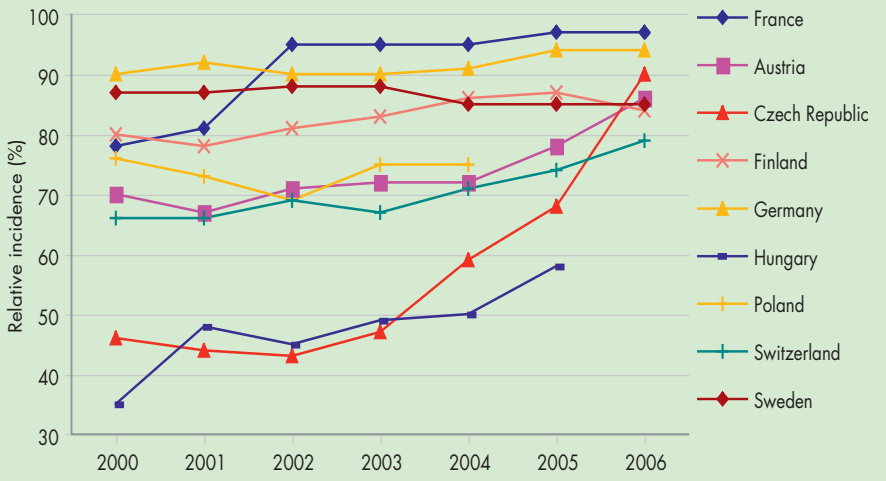
Seat-belt-wearing ratio on motorways



Seat-belt-wearing ratio on country roads



Seat-belt-wearing ratio in town



Source: IRTAD

Making systematic use of optimisation potential

As far as the need for continued increase in road safety is concerned, it is important to be active on various fronts, e.g. the disproportionately high level of accident risk associated with older vehicles, risks due to the failure of electronic systems, motorists' reluctance to have maintenance work carried out. The inspection deadlines for the main inspection play just as much an important role as the contents of the inspection or correctly-executed and professional repair work, to mention only a couple of examples.

The fact that the number of road deaths in Europe has been falling for years now is undisputedly a major success. However, it is just as undisputable a fact that the rate of fall could be far higher. In previous chapters this report has presented a wide range of statistics and evaluations reflecting the current state of road safety for man and machine. The vehicle, in particular, contains numerous areas where existing accident prevention potential can be further optimised. This also applies to technical monitoring services.

Irrespective of how thoroughly one studies the findings of the main inspection, accident analyses or the "Safety-Check" campaign launched by DEKRA, the German Road Safety Council and the German Traffic Service – the conclusion reached is unambiguous: The fault quota rises disproportionately in relation to increasing vehicle age. In this respect, a car between seven and nine years of age inherently has three times as much risk potential as a car aged between one and three years. This situation is acerbated when young, inexperienced drivers are on the road driving these old, but cheap vehicles. In addition, the service life of a car over the past few years has risen continually while at the same time the owner's willingness to visit a workshop decreases as the vehicle ages. Frequently, the vehicle is driven until the failure of a component forces a repair on the owner – and in many cases this failure leads to an accident.

ENORMOUS DIFFERENCES EXIST BETWEEN VEHICLE INSPECTION OPERATIONS WITHIN THE EU

In the circumstances mentioned above, the periodic technical vehicle inspection takes on considerable importance – at the least it detects any faults and enables them to be rectified by a specialist workshop. However, vehicle inspection across the EU is far from uniform. Various countries – for instance, in Greece, Portugal and Ireland – allow a mechanic to conduct the periodic technical inspection under certain conditions, while in Germany and Denmark the task must be performed by trained engineers. In Great Britain workshops can take on this responsibility while in Germany and France neutral service providers like DEKRA are used. The inspection scope and the inspection periods also vary in the EU. Although a set of minimum requirements are stipulated in the EU Directive 96/96/EC, the individual member states can raise their testing standards.

MINIMUM STANDARDS FOR THE MAIN VEHICLE INSPECTION

Inspection criteria for the following items have been established across Europe by Directive 96/96/EC:

- Brakes
- Steering
- Vision
- Lights and electrics
- Axles, wheels, tyres
- Running gear
- Other equipment

An example is the inspection interval. Many EU countries – in accordance with the minimum standards outlined in the Directive 96/96/EC – still merely inspect the technical safety of older cars every two years. These include Germany, France, Czech Republic, Italy, Spain and Greece. In contrast, other countries such as Belgium, Luxembourg, Austria, Great Britain, Sweden, Finland and Poland have reacted to the greater likelihood of older cars displaying faults by adopting one-year inspection intervals for vehicles from a specific age.

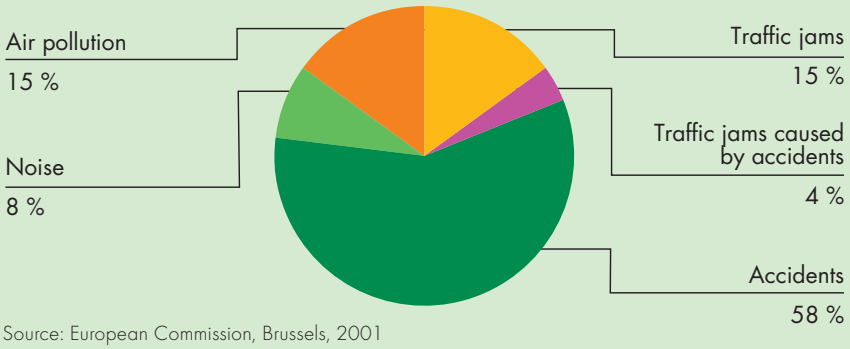
SHORTENING THE INSPECTION INTERVALS TO REDUCE THE NUMBER OF ROAD DEATHS

DEKRA is convinced that shortening the inspection interval, in particular for vehicles that have been in use for eight years and more, is the right way to proceed and it will result in a considerable increase in safety. If the inspection intervals of older vehicles were changed appropriately, there would be significantly fewer road deaths and injuries across Europe.

A standardised shortening of the inspection intervals for older vehicles across Europe is also a key recommendation in the "AUTOFORE Study on the future options for roadworthiness enforcement in the European Union", published in 2007. The study was drawn up by the international association for the technical inspection of motor vehicles (CITA) in co-operation with five research institutes. Apart from the further reduction of the number of road deaths and injuries, the AUTOFORE Study also anticipates an economic benefit from the annual inspection of older vehicles. This is based upon, firstly, fewer accidents at a lower cost in terms of personal injury and property damage, and secondly, fewer traffic jams with consequent savings in time, vehicle operation, fuel and emissions. All in all, the economic benefit derivable

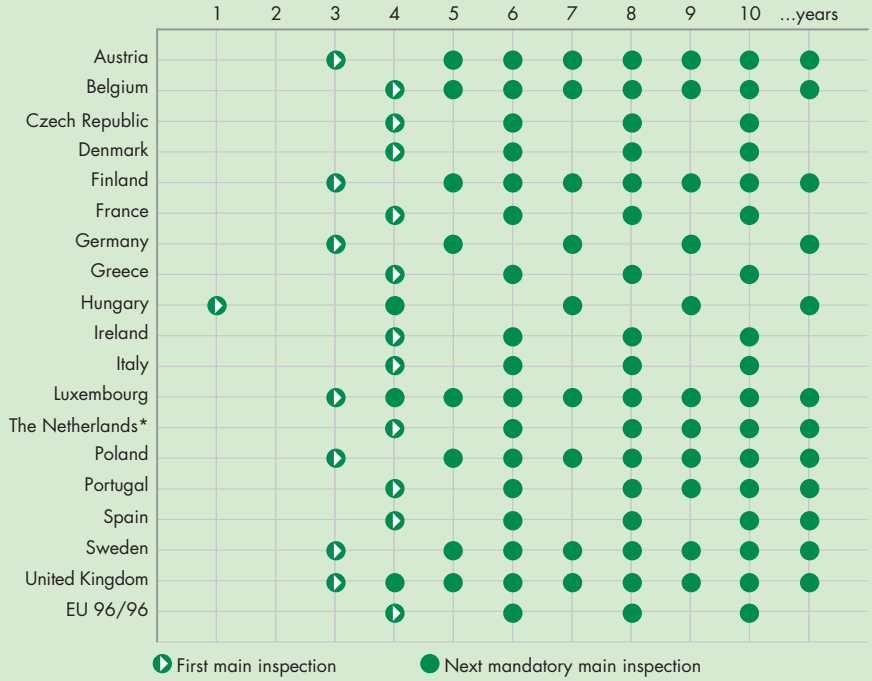
EXTERNAL COSTS OF ROAD TRAFFIC IN THE EU

These amount to: 260 billion euros (4% of social product)



Source: European Commission, Brussels, 2001

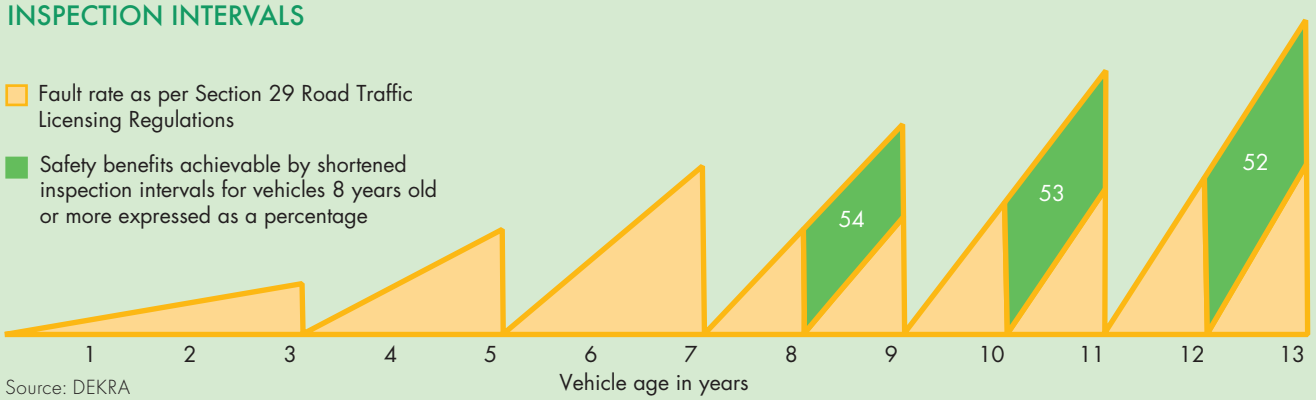
INSPECTION INTERVALS FOR CARS IN THE EU



* For diesel or gas powered cars the first main inspection takes place after 3 years, followed by a yearly cycle.

Sources: CITA, Autofore, DEKRA

INSPECTION INTERVALS



Source: DEKRA

Vehicle system data help in the identification and inspection of modern safety systems.

from annual inspections of vehicles more than eight years across Europe would be over two billion euros.

ELECTRONIC SYSTEMS MUST ALSO BE INSPECTED PERIODICALLY

The AUTOFORE Study also makes another recommendation which tallies with the experience of DEKRA inspection and accident analysis experts. This is the recommendation to introduce the inspection of electronic vehicle systems and components as a part of the regular main inspection throughout Europe. Partially because of DEKRA's commitment, Germany is the first country worldwide that has already introduced the inspection of electronic systems. There is no doubt that this is a step in the right direction. This is because following optimisation of the passive safety systems over the past decades and the increasing development of active systems, the integration of passive and active safety elements in the vehicles is becoming more and more important. And there is a lot of potential in modern vehicle electronics that can be harnessed to avoid accidents and minimise their consequences.

The fact is that the electronic systems available today will soon herald a whole new dimension in vehicle safety. Fundamental progress in the reduction of road deaths can be expected primarily from integrating passive vehicle safety systems (airbags, safety belts, rigid occupant cells) and active systems (ESP, emergency braking assistant, automatic cruise control) into an overall concept. This concept of "Integrated Safety" will see the development of driver assistant systems which will increasingly evolve from merely providing information via warning functions to actively intervening in the driving experience.

However, as diverse studies have shown, electronics are also subject to a certain degree of wear. They are not free of system errors, can be manipulated, switched off and removed from the vehicle.

The CITA organisation already mentioned has carried out studies which show that electronically controlled systems in vehicles develop relatively the same number of faults as mechanical systems

ROAD SAFETY BENEFIT IN MILLIONS OF EUROS ACHIEVABLE BY SHORTENING THE INSPECTION INTERVALS FOR VEHICLES AGED 8 YEARS AND OVER TO ONE YEAR

Country	Fewer deaths	Fewer serious injuries	Fewer minor injuries	Traffic jam savings	Total
Czech Republic	48.71	28.08	24.69	9.11	110.59
Denmark	9.55	12.44	2.46	1.48	25.93
Estonia	0.20	0.07	0.07	0.02	0.36
France	125.08	63.49	51.68	19.50	259.75
Germany	201.73	375.49	284.23	107.08	968.53
Greece	39.02	8.90	10.94	3.79	62.65
Hungary	37.60	17.77	15.63	5.61	76.61
Ireland	5.01	2.56	2.62	0.89	11.08
Italy	135.56	153.37	162.43	53.58	504.94
Lithuania	19.70	4.75	4.18	1.64	30.27
Slovenia	6.72	10.92	9.61	3.21	30.46
Spain	14.01	10.18	7.92	2.57	34.68
Total	642.89	688.02	576.46	208.48	2,115.85

Source: AUTOFORE

and these have been categorised as important enough to be worthy of inclusion in the periodic inspections. The fault rates of electronic systems increase both with vehicle age and mileage.

SYSTEM DATABASE PROVIDES IMPORTANT INFORMATION

Every single vehicle owner – and indeed all other road users – must be able to rely completely on the correct function of the electronics fitted to their vehicles. Furthermore, each driver must be able to enjoy this confidence not just for two, three or four years, but over the entire service life of the vehicle. However, ensuring the correct functioning of vehicle electronics is essential not only for road safety reasons because inspection of the exhaust components also contributes to lessening harmful emissions and reducing the burden on the environment thereby ensuring the correct function of the vehicles themselves.

In order to establish which electronically supported systems have been integrated into a car and whether they work correctly, experts in Germany have had access to an extensive system database since January 2006. In October 2004, 10 technical inspection centres and monitoring organisations – including DEKRA – founded the FSD Fahrzeugsystemdaten GMbH based in Dresden specifically to set up the system database.

The system database is predominantly based upon information supplied by the vehicle manufacturers and importers about the systems installed in their vehicles together with the test procedures used for them. Using the data provided by the system database the inspection engineers can establish whether the prescribed safety level of the vehicle has been reduced impermissibly by, for example, changes to or removals of particular items.

ADAPTING THE MAIN INSPECTION TO THE CURRENT STATE OF TECHNOLOGY

- Driver assistant systems have a multitude of possible system states.
- Driver assistant systems are frequently only dynamically active and often only in specific operating states, for example, when the vehicle is in motion.
- There are hardly any limits as regards the performance capabilities.
- It is not easy to recognise the existence of the resource or its correct and safe functioning.

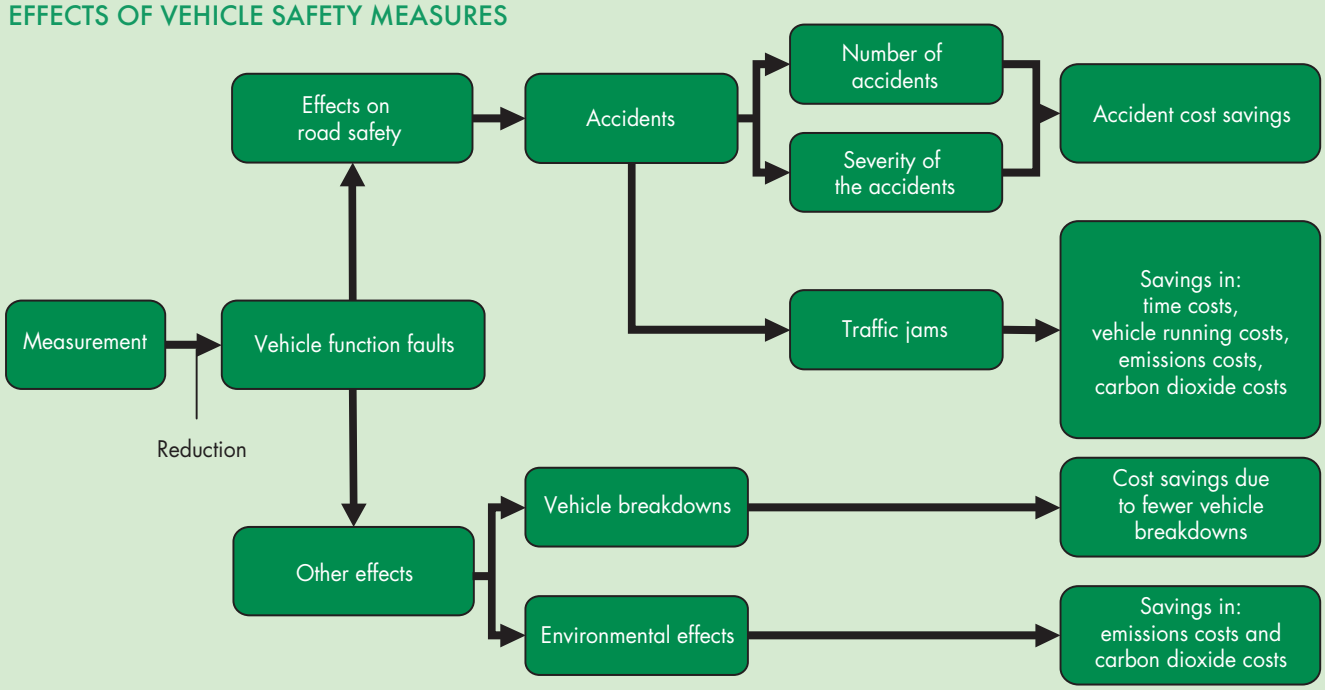
Driver assistant systems therefore require other inspection criteria and methods to be employed at the main inspection than those applicable to the inspection of mechanical components in the vehicle.

PROPER REPAIR WORK BY QUALIFIED WORKSHOPS

Another way of reducing the number of road deaths and injuries on Europe's roads and at the same time of retaining the value of the vehicles can be the introduction of a requirement to provide evidence of proper repair work following serious accidents. This is because the quality of accident repair work has a decisive effect on the active and passive safety of a car. In this context do-it-yourself repairs in particular constitute a great risk for road safety.

An impressive example of this was an accident simulation carried out by the DEKRA Technology Center in Neumünster in which a vehicle underwent an initial crash (lateral post impact) and was repaired as cheaply as possible using poor quality spare parts. The consequences of this became abundantly clear when the vehicle was subject to another crash test, this time a head-on collision. Some of the repaired body parts reacted completely differently to what might have been expected and the consequences were much worse than were likely for a vehicle in its original condition. DEKRA has therefore launched a "Fair Repair" offensive, which calls for clear evidence of proper repair work following serious accidents – a requirement which is already obligatory in other countries, for example, the Benelux states, France and Austria. Such

EFFECTS OF VEHICLE SAFETY MEASURES



Source: Prof. Dr. Wolfgang H. Schulz
EFH Fresenius – University of Applied Science, Faculty of Business and Media

a regulation should basically apply to all EU states.

CREATING FINANCIAL INCENTIVES TO PURCHASE DRIVER ASSISTANT SYSTEMS

Despite all the positive developments in integrating passive and active safety elements in the vehicles, the desirable spread of driver assistant systems to the vehicle stock has not been progressing as fast as it could for some time now. The provision of all new cars with ESP as standard equipment should therefore be given high priority.

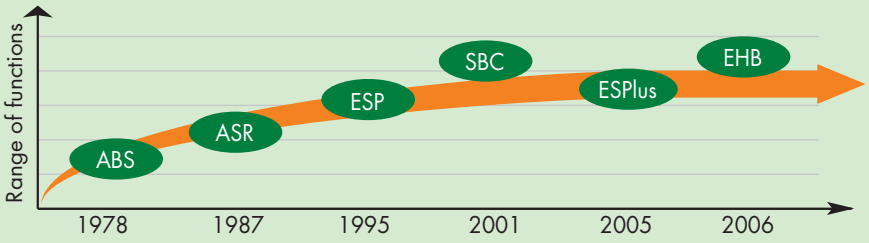
Furthermore, manufacturers as well as road safety organisations and the media are called upon to do much more to draw the general public's attention to the benefits of these electronic "guardian angels" and to provide more arguments in favour of the broader introduction of driver assistant systems. However, government and industry must at the same time provide a framework in which technical solutions are accepted more swiftly by the market and can develop their full benefits – for example, by providing financial incentives for the installation of the most up-to-date management and driver assistant systems.

It would then be conceivable that a voluntary initiative undertaken by businesses and aimed at vans and trucks could also be applied to cars. That initiative is the "Safetyplus Truck" concept launched by Daimler, the Allianz Insurance Company and DEKRA in 2006, which is designed to greatly reduce the number and consequences of accidents involving trucks by optimising active and passive vehicle safety. The transport companies receive incentives in the form of favourable special equipment packages and more favourable insurance premiums if, for example, the vehicles are fitted with driving dynamic regulation systems such as ESP, adaptive cruise control (ACC) or electronic lane guard systems.

A study by the Alliance Centre for Technology has demonstrated that these systems have a significant effect on reducing the accident potential of commercial vehicles. The extensive employment of driving dynamic systems could avoid, or at least lessen, the consequences of up to eight per cent of serious accidents involving personal injury; adaptive cruise control would contribute seven per cent and electronic lane guard systems up to four per cent.

The systems are highly effective on the motorway in particular. They aid the driver – as far as physically possible – in typical situations of inattentiveness such as driving to close to the vehicle in front or taking corners at too high a speed – or when making rapid evasive manoeuvres. If fitted to a car, these systems would also represent an efficient safety package. from which young drivers in particular could profit.

DEVELOPMENT OF VEHICLE SYSTEMS



ABS = anti-lock braking system
ASR = anti-spin regulation
ESP = electronic stability program
SBC = Sensotronic brake control
ESPlus = ESP with steering intervention
EHB = electrohydraulic brake

Source: BOSCH

CRASH TEST RESULTING IN CONSIDERABLE DAMAGE

This crash test clearly shows the weakening of the vehicle body in areas where safety could be put at risk in a serious accident. The facts that the manufacturer's instructions were ignored and the repair of the VW Passat damaged in a previous crash was incorrectly carried out played a decisive role:

- Body-frame incorrectly straightened
- B-pillar and sill removed and hot-straightened
- Roof and floor hot-straightened
- Parts rewelded, filled and painted

Consequences of the second, head-on crash:

- The floor group displayed severe warping.
- The sill has been buckled out downwards.
- The repaired A-pillar is excessively erect.

Conclusion

The objective set out in the EU charter for road safety, which aims to halve the annual number of deaths on the road by 2010, is an ambitious one, but it can be achieved. Nevertheless, this will only come about if all existing optimisation potential is systematically exploited and the requisite measures are implemented quickly at all political and economic levels across Europe.

If the aim is to achieve the target set by the EU Charter for Road Safety by 2010, not only must roadside checks for alcohol and drugs, or for speed violations and inter-vehicle distance be intensified, but, above all else, focus must be increasingly be placed on the vehicle itself. The equipping of new vehicles with modern vehicle electronics as standard items would currently offer the greatest potential for avoiding accidents or reducing their severity.

But there is further potential to be exploited and the periodic main inspection is a part of this approach. In Germany the main inspection has performed sterling service for decades and is the role model for other states in Europe. Germany has also taken a pioneering role in making the testing of electronic components a part of the inspection. At the same time, however, the vehicles on the road are becoming older and older. Consequently, shortening the inspection intervals for vehicles aged eight years and over to one year would undoubtedly generate a considerable gain in safety as perceived by the EU Charter. This is because one thing remains undisputed – as the vehicle age increases, the number of faults rises dramatically due to a lack of maintenance or general wear. This also applies to safety-relevant systems the perfect function of which must be ensured over the entire vehicle life in the interest of all road users.

As the cited AUTOFORE Study shows, shorter inspection periods for older vehicles could reduce the number of road fatalities by around 200 in Germany. In addition, a study by the University of Cologne conducted in 2007 revealed that a swifter introduction of ESP could prevent an additional 100 road fatalities in Germany every year – and this figure would rise to 4,000 if the measure was applied throughout the 25 EU member states. Another example: "Predictive Safety Systems", i.e. the "Predictive Emergency Brake" (PEB) and the "Predictive Collision Warning" (PCW) could prevent approximately 350 road deaths annually in Germany alone.

If road safety potential was systematically exploited by just these few examples around 650 lives could be saved in Germany alone. The measures already introduced such as the no-drink-driving regulation for beginner drivers and not issuing a driving licence until the age of 17 automatically contribute further potential improvements.

This is why DEKRA is appealing to the national and the European powers that be to take advantage of the safety potential already currently available by initiating a blanket introduction of electronic driver assistant systems and shortening the inspection periods in the interest of road safety.

There is only one option – swift and decisive action – because every person who dies in a road accident or sustains injury is one person too many. The potential is out there; we can achieve the objective!

Any questions?

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Country overview

EUROPE

1 GERMANY
- DEKRA e.V.
- DEKRA AG
- DEKRA Automobil
- DEKRA Consulting
- DEKRA Testing & Inspection
- DEKRA EXAM
- DEKRA Real Estate Expertise
- DEKRA Umwelt
- DEKRA Certification
- DEKRA Akademie
- DEKRA Arbeit
- DEKRA Personaldienste
- DEKRA International
- DEKRA Claims Services
- EuroTransportMedia

2 FRANCE
- DEKRA France S.A.S.
- DEKRA Automotive
- DEKRA Claims Services
- DEKRA Certification
- NORISKO S.A.
- NORISKO Equipements
- NORISKO Construction
- NORISKO Environnement
- NORISKO Immobilier
- NORISKO Coordination

3 TURKEY
- DEKRA Certification
- DEKRA NORISKO Industrial
- DEKRA Claims Services

4 RUSSIA
- TRANSDEKRA

5 GREAT BRITAIN
- DEKRA Claims Services

6 ITALY
- DEKRA Revisioni Italia
- DEKRA Automotive Services
- DEKRA Claims Services
- DEKRA Certification

7 SPAIN
- DEKRA Calzado Expert
- DEKRA Claims Services
- DEKRA Certification

8 POLAND
- DEKRA Polska
- DEKRA NORISKO Industrial
- DEKRA Certification

9 RUMANIA
- DEKRA Certification

10 THE NETHERLANDS
- DEKRA Nederland
- DEKRA Claims Services

11 GREECE
- DEKRA Hellas

12 SERBIA
- DEKRA Arbeit

13 PORTUGAL
- DEKRA Portugal Expertises
- DEKRA Claims Services
- DEKRA Certification

14 BELGIUM
- DEKRA Claims Services

15 CZECH REPUBLIC
- DEKRA Automobil
- DEKRA Certification
- DEKRA Arbeit
- DEKRA Claims Services

16 HUNGARY
- DEKRA Expert
- DEKRA Claims Services
- DEKRA Certification
- DEKRA Arbeit
- DEKRA Akademie

17 SWEDEN
- DEKRA Automotive
- DEKRA Claims Services

18 AUSTRIA
- DEKRA Austria Automotive
- DEKRA Claims Services
- DEKRA Certification
- DEKRA Real Estate Expertise

19 BULGARIA
- DEKRA Automotive

20 SWITZERLAND
- DEKRA Claims Services
- DEKRA Certification

21 SLOVAKIA
- SLOVDEKRA
- DEKRA Arbeit
- DEKRA Certification

22 BOSNIA-HERZEGOVINA
- DEKRA Arbeit

23 CROATIA
- DEKRA Ekspert
- DEKRA Arbeit

24 MACEDONIA
- DEKRA Arbeit

25 LUXEMBOURG
- DEKRA Claims Services

26 THE UKRAINE
- DEKRA Expert

27 SLOVENIA
- DEKRA Ekspert

28 LIECHTENSTEIN
- DEKRA Claims Services

OVERSEAS

USA
- DEKRA America
- DEKRA Emission Check
- DEKRA Vinçotte Certification

MOROCCO
- DEKRA Automotive
- DEKRA Claims Services

ALGERIA
- DEKRA NORISKO Industrial

SOUTH AFRICA
- DEKRA NORISKO Industrial
- DEKRA Certification
- DEKRA Automotive

BRAZIL
- DEKRA Brasil Automotivo
- DEKRA Expertises

CHINA
- DEKRA China

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