



Compact accident research

The older truck driver: A future problem?

Imprint

German Insurance Association

German Insurers Accident Research

Wilhelmstraße 43/43G, 10117 Berlin

PO Box 08 02 64, 10002 Berlin

unfallforschung@gdv.org

www.udv.de

Editor: Dipl.-Ing. Sabine Degener

Expert advice: Institute for Applied Psychology (mvu), Allianz Technical Centre

Layout: Franziska Gerson Pereira

Technical: Wilfried Butenhof

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Summary

Against the background of demographic developments, the increase in goods traffic and a shortage of young successor truck drivers, an increase in the number of older truck drivers can be expected.

Research to date on older truck drivers is as a rule limited to the car driver. Truck drivers though have fewer compensation possibilities than ordinary drivers and are exposed to more severe tension. For this reason the issue of the endangerment of traffic safety by older truck drivers was analysed on the basis of special evaluations of available accident data as well as responses to surveys and expert opinions.

The result shows a rise in the accident risk posed by truck drivers as from the age of 65. As is the case in respect of older car drivers, this group of drivers finds it especially difficult to master complex traffic situations. In addition, driving in conditions of darkness leads to errors of judgement as far as distance and speed are concerned. In combination with professional pressures these results demonstrate the need for action in the area of traffic safety, but also in terms of the health protection of truck drivers. Apart from training measures for truck drivers the proposed measures contain especially offers of training employers, an improved job environment at the workplace, and technical measures as far as trucks are concerned.

Content

	Summary	2
1	Introduction	4
2	The accident- and safety situation of older truck drivers	5
3	Stress areas in the truck drivers's work environment	8
4	The need for action and measures in respect of older truck drivers - a futur view	9
	Bibliography	11

1 Introduction

The demographic development in Germany is also reflected on its roads through a growing number of older road users. For a number of years this group has therefore been the object of special research and discussion.

In 1994 Pfafferot reported a increase in the number of accidents and in the number of accident causers of growing age, a increase which becomes especially clear as from the age of 65. Meanwhile international comparative results are available on the driving risk of older drivers [11]; [3]; [15] to be published. A differentiation according to type of accident or accident causes illustrates that alcohol, reduced following distances or speeding do not play a substantial role. Instead the execution of complex driving tasks, like, for example, turning and observing right-of-way precedence at innercity junctions cause elderly drivers special problems.[7]. According to the ratings by experts of the AGILE research report [1], older drivers draw special attention with reference to their accident- and driving error data in complex and challenging situations. The age-related changes in the mental performance ability (observation, central cognitive processes, psychomotricity), which seem to have a particularly unfavourable impact on driving, are the basic reason for the latter.

Older drivers commit more mistakes in particular situations and need more time and energy to produce the type of driving behaviour required by the situation. To be noted, however, are the strong heterogeneity of the group of older drivers and, on the other hand, the possibility of compensating for age-related shortcomings on the strategic or tactical level of the task of driving. As such rides during peak traffic hours or at night can be avoided, known routes can be used preferentially and speeds can be adapted.

The changes in demography also affect truck- and, for that matter, bus traffic. The FMTA-data relating to driving licences indicates that there will be a high number of elderly truck drivers in future: the number of Class C- and Class CE driving licences rose from approx. 4.36 million to approx. 5.61 million between 2003 and 2006. In this regard it is significant to note that there has been a strong increase in the age group of 40- to 49 year-olds, thus the age group which will eventually be counted as part of the group of elderly drivers. In addition there is constant growth in goods traffic in general and in truck traffic specifically. Simultaneously a shortage of young successor truck drivers makes itself felt [16], a fact which is bemoaned by truck drivers themselves. This gives rise to the assumption that in future a growing proportion of older professional truck drivers will haul an increasing volume of goods on German roads. In view of the demand for an extension of normal working life, this makes the topic "older truck drivers" of additional relevance.

Studies in this regard have hitherto not been done, and there are only a handful of meaningful facts on the risk assessment of this group in road traffic. To add to the latter, neither is a longitudinal section of data on the age distribution in road haulage available, nor is specific data on driving performance to be obtained, both of which are essential for an exact observation of the accident involvement of elderly truck drivers. To date only a few studies exist that deal with the pressures and demands made on truck drivers; an age-group related analysis is also lacking in this case. The absence of a safety analysis on the topic of older truck drivers can not be counterbalanced by a mere transfer of findings regarding older car drivers. In considering the findings on the general ability to perform, it should be borne in mind that truck drivers surely do not form a

representative sample of drivers as a whole. As Rodgers [14] clearly demonstrates, truck drivers are by nature of their daily work subjected to different pressures than car drivers, and, in addition, have fewer compensation possibilities. As such, and other than senior citizens travelling privately, they work under severe time constraints which allow for little freedom to act. To draw analogies from the results on the risk posed by older car drivers is therefore not permissible. The question of the endangerment of traffic by older truck drivers therefore has to be considered separately.

For this reason the Insurers Accident Research commissioned the Allianz Technical Centre in cooperation with the Institute for Applied Psychology (mvu) to compile available data on the accident- and safety situation of older drivers and to analyse the data focussing especially on older truck drivers. Exploratory interviews with older truck drivers as well as a workshop of experts were furthermore to

provide clarity on workplace-specific details and sensible measures in respect of older truck drivers [8].

2 The accident- and safety situation of older truck drivers

The submitted research document collected the available literature as well as national and international data sources on the topic and analysed data from surveys from the research report by Fastenmeier, Gwehenberger & Finshterer [6]. One of the core sources of data was a special evaluation done by the German Federal Statistical Office (StBA), which dealt exclusively with truck accidents with a weight of at least 7.5 tonnes (StBA, 2006). Even in this case, though, the age classification is rough.

A first clear result is evidenced by the similarity to the accident situation involving car drivers. This results both from survey data [6] as well as the special evaluation of the German Federal Statistical Office (StBA, 2006). As

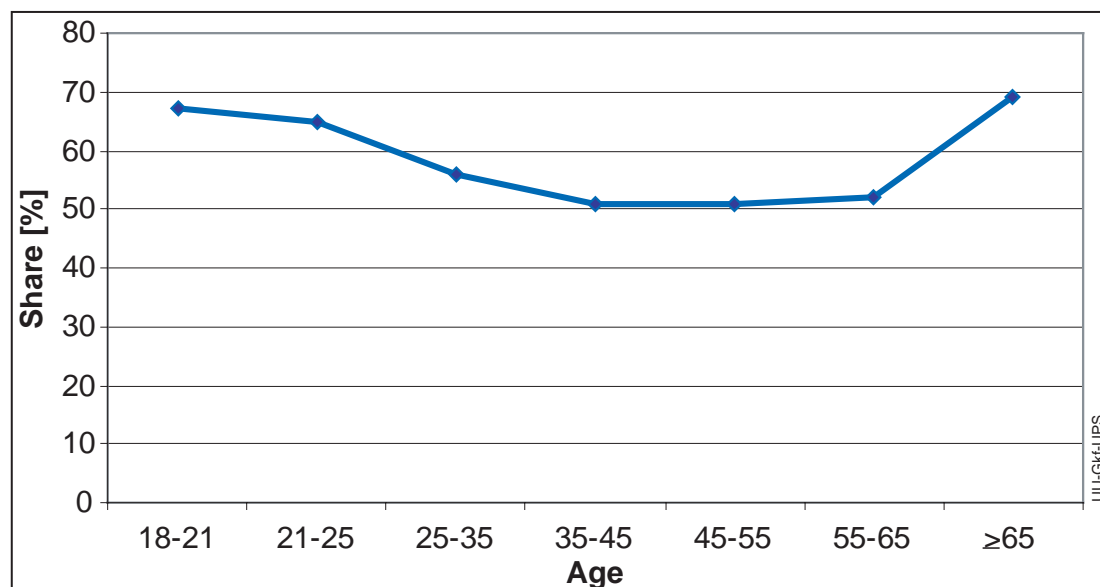


Illustration 1:

Share of accidents caused by drivers of trucks over 7.5 t per 1.000 involved in accidents with personal injury in 2004 according to age groups (according to special evaluation by StBA, 2006)

from the age of 65 there is an increase in the accident risk and main-causer share of persons involved in truck accidents with personal injury (comp. Illustration 1). The youngest and oldest age groups are markedly higher when compared to the middle age groups, resulting in a division that takes the shape of a flattened u-curve (Chi-square, $p < 0.05$, between 55-65 year-olds and ≥ 65 year-olds).

A special analysis of the data of the Federal Statistical Office also shows a clear increase in wrong conduct by truck drivers aged 65 and older. Illustration 2 depicts the wrong conduct by truck drivers broken up into five different forms of conduct. Not all forms of conduct increase correspondingly with the growing age of the driver; noticeable are the errors committed in the group right-of-way/precedence

(Chi-square, $p < 0.05$) as well as incorrect use of the road (Chi-square, $p < 0.05$). The increases in the other graphs are not statistically meaningful.

The evaluation of US accident data performed within the framework of the research study (a database with 50,000 accidents with truck involvement) makes it clear that with increasing age those accidents occurring whilst turning off form an increasing share of accidents caused by truck drivers themselves. A differentiation according to the type of turning accidents shows that the increase is distributed unevenly across the three types of turning accidents (Illustration 3). The share of turning manoeuvres in which the truck collides with other road users travelling in the same direction, does not increase correspondingly. In

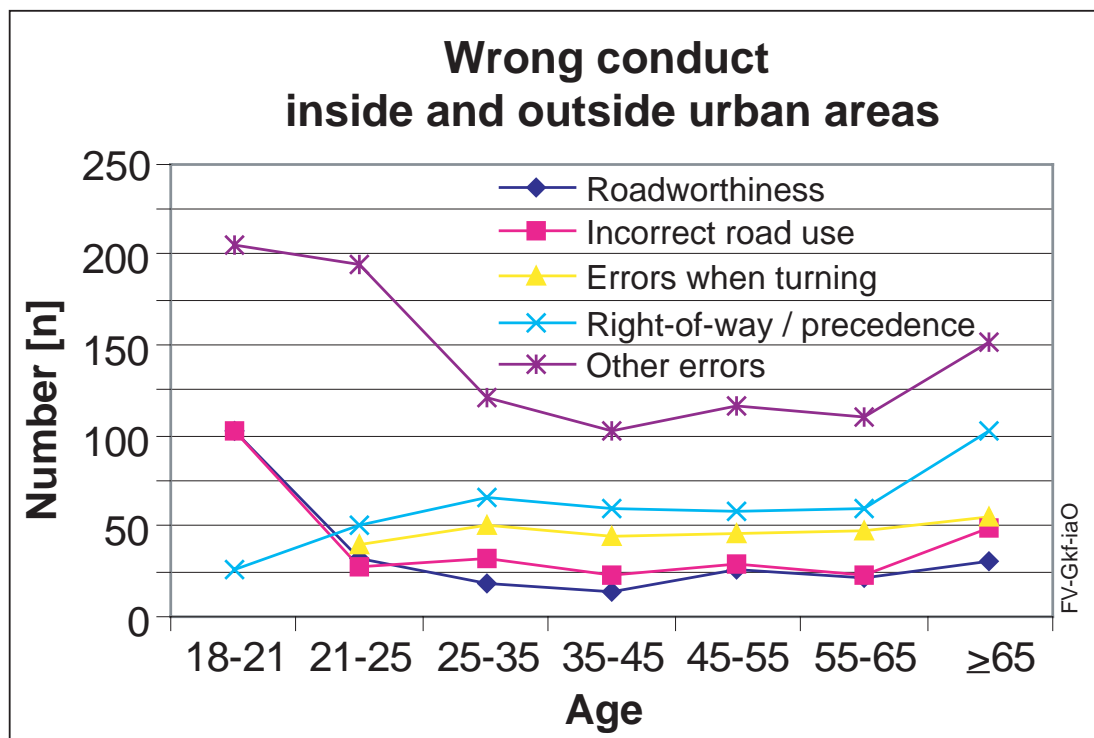


Illustration 2:
Erroneous conduct by drivers involved of trucks of over 7.5 t per 1.000 involved in accidents with personal injury in 2004 according to age groups inside and outside urban areas (according to special evaluation by the StBA, 2006)

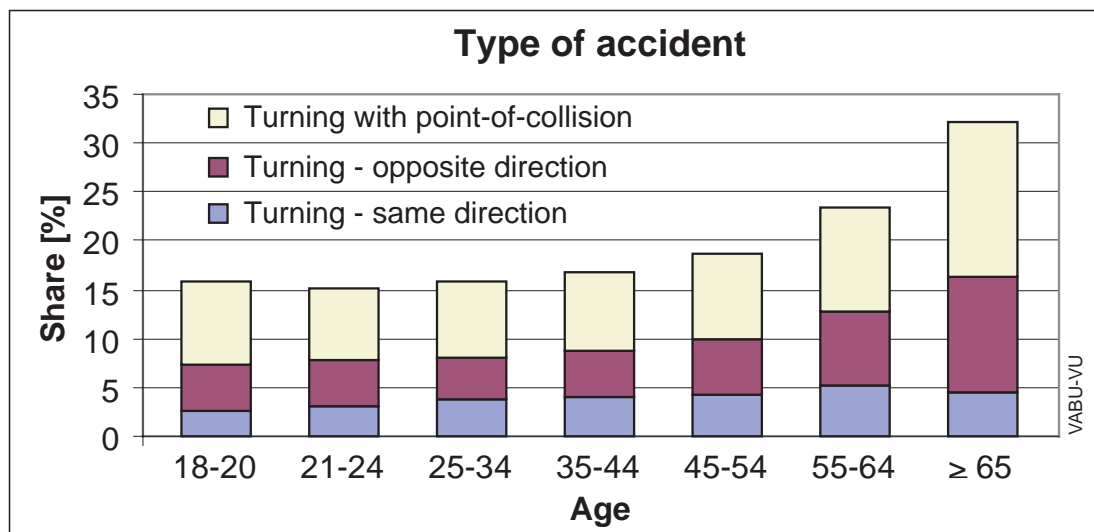


Illustration 3:
Share of different types of turning accidents caused out of total number of accidents caused according to age groups (according to data of Thomas Jonsson/University of Connecticut) [10]

those cases where the vehicles involved approach each other from opposite directions, the share of the 55-65 year-olds is significantly higher than that of younger age groups. The above 65 year-olds cause even more accidents in such cases than the 55-65 year-olds. (Poison Regression, each with $p < 0.0001$).

In cases of turning where truck drivers have to adapt their own conduct to accommodate the conduct of other road users to avoid a collision, the effect of age is particularly noticeable: here, too, the oldest fare worst. (Poison Regression, each with $p < 0.0001$). The more complex the driving task, the less able older drivers are able to cope successfully with it.

The consideration of general wrong conduct under different light conditions produces no difference between daylight and darkness (StBA, 2006). Under both conditions the youngest and the oldest truck drivers experience a significantly stronger increase in making mistakes than the other age groups (Chi-square, $p < 0.001$) (without illustration).

If, however, one differentiates according to type of mistake, the influence of the light condition becomes evident. In the case of elderly truck drivers right-of-way/precedence along with insufficient following distances and incorrect speed form part of the increasing causes of accidents in darkness. (comp. Illustration 4).

Fastenmeier et al. [6] already reported that high speed and insufficient following distances create special danger situations or causes of accidents by elderly truck drivers. In conditions of normal visibility these two types of mistakes are, however, completely untypical for older drivers. Obviously elderly drivers commit judgement errors on distance and speed at night. In contrast to older car drivers, truck drivers do not have the possibility of compensating for performance deficits by avoiding night trips.

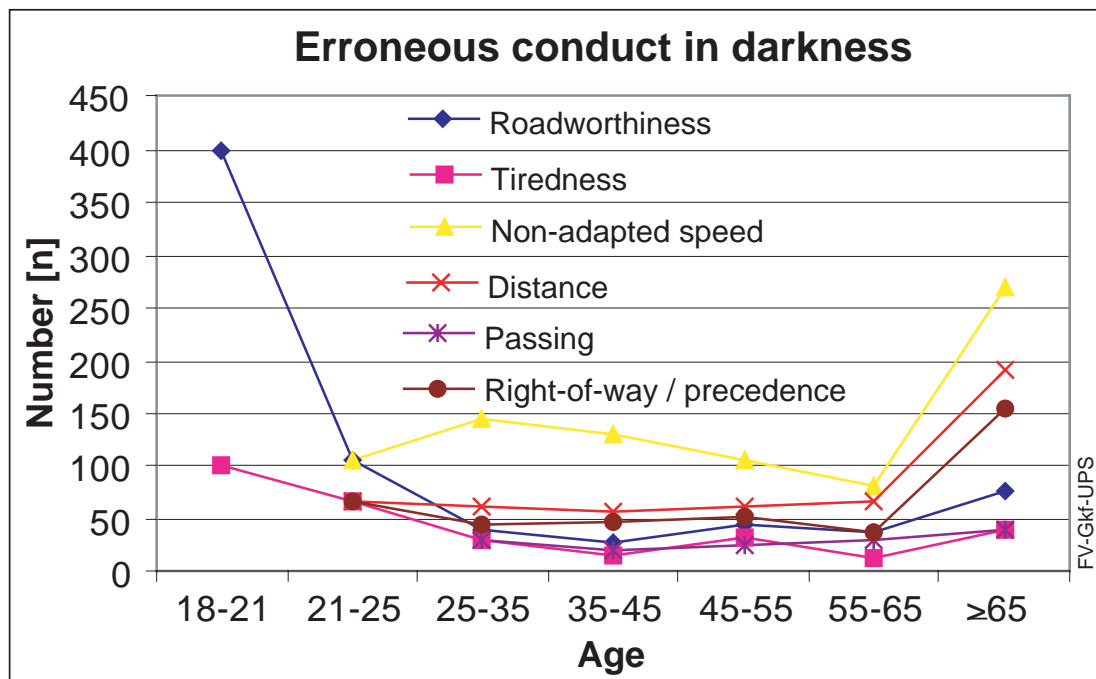


Illustration 4:

Erroneous conduct by drivers involved of trucks of over 7.5 t per 1.000 involved in accidents in darkness with personal injury in 2004 according to age groups (according to special evaluation by the StBA, 2006)

3 Stress areas in the truck drivers's work environment

The professional pressures on a truck driver do not arise solely from long working hours. According to Fastenmeier et al. [6] next to long hours of driving, truck drivers also experience frequent night trips, high traffic density and related traffic jams, scheduling pressures and inclement weather conditions as stressful. The resulting high level of stress leads to tiredness, which is reinforced by the monotony of the driving task. The breaks required for recuperation are, more often than not, not adequately used. According to reports by truck drivers reasons for the latter are the organisational arrangements of haulage companies, but also the restricted offer of highway service areas and parking facilities. The insufficient scheduling of breaks and the fact that truck drivers are on the road virtually day and

night, lead to irregular sleep [9]. The far more significant role of tiredness in severe truck accidents than official accident statistics actually reveal, was reported by Evers & Auerbach [5]. To the aforementioned stress factors can be added family problems, unhealthy nutrition at roadside service areas and health problems. Especially the medical care of truck drivers seems to be severely lacking [2]. There simply is no help available in the case of acute medical problems. Driving tasks are not terminated out of fear of the owners, pain is ignored or self-treatment is practiced.

Physical work like loading and off-loading the truck is seen by truck drivers as especially stressful, in addition difficulties are experienced when getting on or off the truck or checking the load. At the root of these issues are health problems, particularly indispositions of the musculoskeletal system, but also a lack of

knowledge of cargo loading and –securing. Furthermore learning- and relearning processes as well as the execution of additional tasks during trips are part of the age-based problem areas. Sight problems, quick tiring and how illness is being dealt with (e. g. cardio-vascular diseases) can be regarded as being of immediate relevance to traffic and particularly dangerous according to the expert workshop. In addition to the growing physical pressure, emotional stress also increases with age. As such, the subjectively experienced time pressure increases with growing age [4].

4 The need for action and measures in respect of older truck drivers - a future view

Under the assumption that goods haulage will in fact continue to grow strongly, that normal working life will be extended and that the shortage of young successor drivers will persist, the problem of “the older truck driver” will intensify to the extent that proper measures will become unavoidable. These relate to, on the one hand, traffic safety and, on the other hand, to the labour-safety and health care of truck drivers. In view of the fact that an age-specific analysis of the problem is basically not available, there is also a lack of recommendations for improvement.

Apart from training programmes for truck drivers which deal with age-specific problems and their particular solutions, offers of training- and education programmes for employers should especially be considered. In this manner companies should be sensitised for the topics of safety- and health protection, logistics, and scheduling and route planning. Sensible measures also aim to improve the immediate work area. The interface between man and machine, the driver’s cabin, the seat

as well as mounting and dismounting from the cabin should, for example, be constructed with a view to accommodating age-based ergonomic criteria. Improvements should in addition consider job-related environmental factors, e.g. logistics and availability. Electronic aides at off-loading points can contribute, for example, to improved organisation and thus to an increase in sleep time. Finally technical measures relating to the vehicle are to be taken into consideration. Especially with a view to age-related weaknesses during trips with bad visibility, driver assistance systems regulating the following distance could be an important support mechanism. In this case, too, the age-based accommodation of the man-machine-interface is to be effected. Specifically in the implementation of information- and communication technologies age-specific problems like changed observation abilities should be considered.

The implementation of the European labour protection guidelines in the German labour protection law (1996) prescribes the obligation to investigate pressures at the workplace and to develop effective preventative measures. In practice however this is rarely to be found. Instead unsatisfactory work conditions are frequently tolerated. As such, for example, the legally prescribed investigations into areas of endangerment are often not conducted especially in small- and mid-sized companies (comp. [12]).

The implementation of education- and training programmes for truck drivers also provides difficulties in view of the fluctuating availability of older truck drivers. Not only is the lack of a fixed local workplace decisive in this regard, but also the corporate structure of hauliers (many small companies are “one-man-shows”). The demand for education- and training programmes has therefore been li-

mitted to date and will provisionally not rise given the absence of regulations or for that matter sanctions. Hence it seems to be more sensible to appeal to employers with offers of education- and training programmes. It remains questionable, however, how prepared companies would be to participate in measures which promote safety; because business interests and competitive pressures, especially from foreign hauliers, often prevent this.

In order to solve this problem, it may therefore be necessary to effect legislative measures, preferably at the European level.

Against the background of the demographic and socio-political developments on the one hand, and the lack of age-based data on the other hand, the authors witness the danger that the importance of the “older truck driver” as an imminent challenge is being ignored as far as both traffic safety and work- and health protection are concerned.

Bibliography

- [1] AGILE (Aged people integration, mobility, safety and quality of life enhancement through driving) (2001). Deliverable 2.1: Inventory of assessment and decision criteria for elderly drivers, including particular age-related disabilities. Brussels: EU
- [2] Bernickel, R./Bund Deutscher Berufskraftfahrer (10.10.2006). Krank auf Achse – was tun? (On the road whilst being ill – what is to be done?) Unpublished paper
- [3] Department for Transport (Ed.). (2001). Older drivers: a literature review (No. 25). [http://www.roads.dft.gov.uk/roadsafety/research/road safety research reports/theme 3: Impairment](http://www.roads.dft.gov.uk/roadsafety/research/road%20safety%20research%20reports/theme%203%20Impairment)
- [4] Ellinghaus, D. & Steinbrecher, J. (2002): Lkw im Straßenverkehr: Eine Untersuchung über die Beziehungen zwischen Lkw- und Pkw-Fahrern (Trucks in traffic: an investigation into the relationships between truck- and car drivers). Uniroyal traffic investigations, Issue 27. Cologne/Hanover, Uniroyal
- [5] Evers, C. & Auerbach, K. (2005): Verhaltensbezogenen Ursachen schwerer Lkw-Unfälle (Conduct-related causes of severe truck accidents). Berichte der Bundesanstalt für Straßenwesen (Reports of the Federal Highway Research Institute). Brochure M 174. Bremerhaven, NW Publishers
- [6] Fastenmeier, W., Gwehenberger, J. & Finsterer, H. (2002): Lkw-Fahrerbefragung. Ein Beitrag zur Analyse des Unfallgeschehens (Truck driver survey. A contribution to accident analysis). Report 0212. Munich, Institute for Vehicle Safety of the German Insurance Association
- [7] Fastenmeier, W. & Gstalter, H. (2005): Anforderungsgerechtes Autofahren: Wie zuverlässig sind jüngere und ältere Autofahrer? (Challenge-related driving: how reliable are younger and older car drivers?) VDI-Reports, 1919, pp. 113-127, Düsseldorf, VDI Publishers
- [8] Fastenmeier, W., Gstalter, H. & Kubitzki, J. (2007): Der ältere Lkw-Fahrer – Aufriss der Problemlage und erste Ergebnisse (The older truck driver – A first overview of the problem and initial results). Report Nr. F 06 918. Unpublished research paper for the German Insurance Association, Munich, Allianz Technical Centre Automotive GmbH

- [9] Frieling, E., Bogedale, U. & Kiegeland, P. (1990): Tätigkeitsbezogenen Anforderungen und Belastungen bei Berufskraftfahrern und ihre Beziehung zur Straßenverkehrssicherheit (Job-related challenges and pressures of professional truck drivers and their relationship to traffic safety). Research reports of the Federal Highway Research Institute, Nr. 218. Bergisch Gladbach, BAST
- [10] Jonsson, Th. (2006): Data relating to "Truck Accidents 1998 - 2003 in Connecticut (USA)": University of Connecticut, Department of Civil and Environmental Engineering
- [11] Kaiser, H. J. & Oswald, W. D. (2000). Autofahren im Alter: Eine Literaturanalyse (Driving at old age: an analysis of literature). Magazine for Gerontopsychology and – psychiatry, 13, pp. 131 - 170
- [12] Lange, J. & Groth, J. (2005). Sicherheits- und Gesundheitsschutzdefizite im Speditionsgewerbe (Protection- and health protection shortcomings in the haulage business). Publication Series of the German Federal Institute for Occupational Safety and Health, Fb 1056. Bremerhaven: NW Publishers
- [13] Pfafferott, I. (1994). Mobilitätsbedürfnisse und Unfallverwicklung älterer Autofahrer/innen (Mobility needs and accident involvement of older drivers) in U. Tränkle (Publisher) Autofahren im Alter (Driving at old age)(pp. 19 – 36). Cologne: TÜV Rheinland Publishers
- [14] Rogers, W. C. (1999): Safe driving performance of older commercial vehicle drivers. Swedish National Road and transport research Institute VTI (Ed.). Traffic Safety on Two Continents (pp. 39 – 56). London, PTRC Education & Research Services Ltd.
- [15] Schlag, B. (Publisher)(to be published): Altersbegleitende Leistungsveränderungen und ihre Bedeutung für Verkehrsteilnahme und Fahrverhalten (Age-related changes in performance and their meaning for traffic participation and driving conduct). Supported by the Eugen-Otto Bütz-Foundation. Cologne, TÜV Publishers
- [16] trans aktuell (Publisher) (22 December 2006): Fahrerengpass verschärft sich (Driver shortage becomes more acute). Trans aktuell, p 3



Gesamtverband der Deutschen Versicherungswirtschaft e.V.

Wilhelmstraße 43/43G, 10117 Berlin
PO Box 08 02 64, 10002 Berlin

Phone: + 49 30/20 20 - 50 00, Fax: + 49 30/20 20 - 60 00
www.gdv.de, www.udv.de