Involvement of young professional heavy vehicle drivers in road accidents

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FOREWORD

This brief analysis was conducted at the request of the Transport operators unit of the Transport Operators and Technology department at Trafi. The analysis concerns data on the involvement of young professional heavy vehicle drivers in road accidents. The "Summary and conclusions" chapter also identifies needs for further study.

The request for analysis was motivated by the Directive 2003/59/EC, which is about the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers, and its possibly forthcoming revision. A revision of the Directive has been discussed by the Commission and the Member States for several months. However, no data on the involvement of young or inexperienced professional heavy vehicle drivers in road accidents have been presented in these talks.

I would like to give special thanks to Niina Sihvola, Timo Kari and Arja Holopainen at the Finnish Motor Insurers' Centre for delivering materials and for their valuable input.

The original report in Finnish was published on the last day of December 2014 at http://www.trafi.fi/filebank/a/1420031328/628eef74ddf4ba31ad82ceb9faaad63e/16518-Trafin_julkaisuja_25-2014.pdf. Unfortunately the translation procedure from Finnish to English has taken several months to complete.

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CONTENTS

1. INTRODUCTION

The present document is an analysis of the **involvement of young (18–25 years) professional heavy vehicle drivers in fatal road accidents.** Fatal accidents involving young professional drivers are compared, as applicable, to all fatal accidents in heavy traffic.

For the purposes of this analysis, "heavy vehicles" are buses, coaches, lorries and vehicle combinations, i.e. truck-trailer and bus/coach-trailer combinations. Lorries equal to trucks and HGVs (heavy goods vehicles).

"Professional driver" means a person whose job is to drive a bus, coach or lorry. Professional drivers who drive a taxi, van or similar lighter vehicle are excluded from this analysis.

Material

The official road accident statistics maintained by Statistics Finland based on information obtained from the police do not indicate whether a person injured or killed in an accident was a professional driver.[1] Therefore this analysis does not draw on the road accident statistics of Statistics Finland.

Data on the involvement of professional heavy vehicle drivers in accidents is available for accidents investigated by road accident investigation teams. Regional teams investigate all fatal road and terrain accidents that come to their attention.[2] [3] [4]

The accident data materials of Statistics Finland and of the investigation teams differ somewhat from one another. The Statistics Finland dataset excludes cases where a person dies of natural causes, i.e. the driver suffers a seizure of some kind while driving. In the investigation teams' dataset, by contrast, accidents caused by such seizures are included.

This analysis is principally based on material on fatal road accidents from road accident investigation teams. A brief overview is also given of the property damage and personal injury caused by young heavy vehicle drivers recorded in the database of motor insurance damage claims paid out.

Regarding the data from the road accident investigation teams, we should note how fatal accidents differ in nature from less serious accidents that cause injuries or only property damage. Fatal accidents commonly involve great differences in mass between colliding vehicles and high speeds, since these are factors that often influence the seriousness and consequences of accidents.

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[1] Statistics Finland. Road accident statistics. http://lintu.info/english.htm

[2] Finnish Motor Insurers' Centre. Road accident investigations. http://www.lvk.fi/en/traffic-safety/investigation-of-road-accidents/

[3] Finlex: Act on Investigation of Road and Terrain Accidents (24/2001). In Finnish: http://www.finlex.fi/fi/laki/ajantasa/2001/20010024, in Swedish: http://www.finlex.fi/sv/laki/ajantasa/2001/20010024.

[4] Description of the operations, methods and materials of investigation teams (chapter 2) in: Rajamäki, R., Luoma, J. & Kallberg, V.-P. 2014. *Perusohjeita ja -tietoja liikenneonnettomuuksien tutkijalautakuntien keräämän onnettomuusaineiston käytöstä tutkimuksissa. Esimerkkinä raskaan liikenteen onnettomuudet*. Liikennevakuutuskeskus, vakuutusyhtiöiden liikenneturvallisuustoimikunta VALT ja Trafi. [Basic instructions and information on the use of accident material compiled by road accident investigation teams in research. Example: heavy traffic accidents. Finnish Motor Insurers' Centre, Traffic Safety Committee of Insurance Companies (VALT) and Trafi.] http://www.lvk.fi/templates/vinha/services/download.aspx?fid=320818&hash=7648cacfbca558f1b1c03805cd6210dbde9ea2bece43855b4356fd7008c91bcc.

Calculating accident risk

It is not possible to include a calculation of the risk of an accident or personal injury for young professional heavy vehicle drivers in this analysis nor to compare that to the risk of professional heavy vehicle drivers of other ages or to the risk of young car drivers, because sufficiently accurate data on exposure that would be required for calculating these risks are not available.

Also, drive-kilometres data for lorries, buses and coaches are also not available analysed by age of the driver; the number of valid driving licences does not indicate how many persons who have the right to drive a heavy vehicle are actually working as a professional driver; and the number of lorries, buses and coaches registered does not indicate how many of them are driven by a young professional driver.[5]

Novice professional heavy vehicle drivers

The request for analysis involved not only analysing the involvement of young drivers in fatal accidents but also analysing the involvement of novice professional heavy vehicle drivers in accidents. However, extracting data on novice drivers from the material obtained from the road accident investigation teams would have been so time-consuming that it was not possible to undertake it within the confines of this brief analysis.

The electronic system for accessing the material from the road accident investigation teams does not directly indicate the issue dates of the driving licences of the drivers involved. These data would have to be separately found in the forms filled out by the police officer member of each investigation team in the investigation folders.

Another essential piece of background information would be to know when a particular driver began working as a professional driver. This information, however, is not necessarily even given on the interview forms. Also, this would beg the question of the criteria by which a driver is deemed a “novice driver”.

[5] Except for those fatal accidents where the road accident investigation team was able to obtain the drive-kilometres data by interviewing the driver or a family member of the driver.

2. DRIVING LICENCES FOR LORRIES, BUSES AND COACHES, AND PROFESSIONAL COMPETENCE OF DRIVERS

2.1. Driving licence categories

Category C and CE driving licences authorise the holder to drive a lorry and a truck-trailer combination, respectively. Similarly, category C1 and C1E driving licences authorise the holder to drive a lighter lorry and a lighter truck-trailer combination, respectively.

A category D driving licence authorises the holder to drive a bus or coach, and a category DE driving licence allows a trailer to be attached to the bus or coach. Similarly, category D1 and D1E authorise the holder to drive a lighter bus/coach and a lighter bus/coach-trailer combination, respectively.

Category C includes the right to drive vehicles in category C1, and category CE includes the right to drive vehicles in category C1E. Similarly, category D includes the right to drive vehicles in category D1 and category DE includes the right to drive vehicles in category D1E.

The restrictions on mass, length and number of passengers of carried for the vehicles in each of these categories are given in section 4 of the Driving Licence Act (386/2011).[6]

2.2. Driving licence age limits

The age limit for category C1 and C1E driving licences is 18 years.

The age limit for category C and CE driving licences is principally 21 years. However, it is possible for a person aged 18 or over to be issued a driving licence for a lorry or vehicle combination if the person is required to drive such a vehicle for his/her job. The candidate needs to complete a separate professional lorry driver's qualification in addition to driving instruction and the driver's examination. The professional qualification must not be an accelerated initial professional qualification.

The age limit for category D1 and D1E driving licences is 21 years.

The age limit for category D and DE driving licences is 24 years. However, it is possible for a person aged 23 to be issued a driving licence for buses/coaches and vehicle combinations if the person has completed an accelerated initial professional qualification as a bus/coach driver, or for a person aged 21 to be issued such a licence if the person has completed a professional qualification as a bus/coach driver other than an accelerated initial professional qualification.

Also, a person aged 18 or more who has completed a basic vocational qualification for bus drivers and has a professional qualification other than an accelerated initial professional qualification may be issued a category D driving licence.

The minimum age requirements for the various driving licence categories are given in section 5 of the Driving Licence Act (386/2011). [7]

[6] Finlex: Driving Licence Act (386/2011). In Finnish: http://www.finlex.fi/fi/laki/ajantasa/2011/20110386, in Swedish: http://www.finlex.fi/sv/laki/ajantasa/2011/20110386

[7] Finlex: Driving Licence Act (386/2011). In Finnish: http://www.finlex.fi/fi/laki/ajantasa/2011/20110386, in Swedish: http://www.finlex.fi/sv/laki/ajantasa/2011/20110386

2.3. Professional competence of lorry, bus and coach drivers

A professional qualification is required of all lorry, bus and coach drivers in road traffic. This applies to all such professional drivers regardless of their age. The requirement derives from Directive 2003/59/EC.[8]

Directive's provisions are implemented in national legislation in the Act (273/2007)[9] and Decree (640/2007)[10] on the Professional Qualifications of Lorry and Bus Drivers. A working group report on the implementation of the Directive has also been published.[11]

The purpose of the professional qualification requirement is to improve the professional competence of drivers and thus the safety of road traffic and transport, and also the driver's capabilities for carrying out his/her duties. Professional qualification training includes teaching on transport requirements, road traffic safety, factors affecting the safety of the driver and of transport, and good professional conduct.

A professional qualification has been required of all drivers in passenger transport (buses/coaches) as of 10 Sep 2013 and in goods transport (lorries) as of 10 Sep 2014. A person does not need to complete a separate initial professional qualification if studying for a vocational qualification that includes compatible professional training.

An initial professional qualification is not required from a bus/coach driver whose right to drive a bus/coach dates from before 10 Sep 2008 or from a lorry driver whose right to drive a lorry dates from before 10 Sep 2009. In order for a driver to be able to continue performing the transport duties referred to in the Act on the Professional Qualifications of Lorry and Bus Drivers (273/2007), he/she must complete the specified further training within five years of the aforementioned dates.

A professional qualification is valid for five years after completing the initial professional qualification. The validity of the qualification may be extended for a period of five years at a time for persons who attend further training, though not beyond the expiry of the right to drive of the driving licence holder. If a driver's professional qualification has expired because he/she has not attended further training, it may be reinstated by the driver attending further training.

Lorry and bus/coach drivers must carry a certificate of their professional qualification: either a separate professional qualification card or a driving licence on which special condition 95 indicating a professional qualification is entered.

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[8] Eurlex: Directive 2003/59/EC of the European Parliament and of the Council of 15 July 2003 on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers, amending Council Regulation (EEC) No 3820/75 and Council Directive 91/439/EEC and repealing Council Directive 76/914/EEC. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:226:0004:0017:FI:PDF.

[9] Finlex: Act on the Professional Qualifications of Lorry and Bus Drivers (273/2007). In Finnish: http://www.finlex.fi/fi/laki/ajantasa/2007/20070273, in Swedish: http://www.finlex.fi/sv/laki/ajantasa/2007/20070273.

[10] Finlex: Government Decree on the Professional Qualifications of Lorry and Bus Drivers (640/2007). In Finnish: http://www.finlex.fi/fi/laki/alkup/2007/20070640, in Swedish: http://www.finlex.fi/sv/laki/alkup/2007/20070640.

[11] Ministry of Education and Culture 2005. *Maantieliikenteen kuljettajien ammattipätevyysdirektiivin toimeenpano*. Opetusministeriön työryhmämuistioita ja selvityksiä 2005: 7. [Implementation of the road traffic drivers' professional qualifications directive. Ministry of Education and Culture, working group memos and reports 2005:7.] http://www.minedu.fi/export/sites/default/OPM/Julkaisut/2005/liitteet/opm_257_tr07.pdf?lang=fi.

2.4. Revision of the Directive

Between July and October 2013, the European Commission held a public consultation on the Directive in order to assess how effectively the Directive has met its objectives and what specific action and measures may need to be adopted to improve its effectiveness.[12]

In March 2014, the Commission held a stakeholder conference for Member States and other interest groups concerning the review of the Directive. The purpose of the meeting was to present and confirm the results of the public consultation, to present the findings of the review of the Directive and to discuss options for revising the Directive. All the materials published by the Commission may be found at: http://ec.europa.eu/transport/road_safety/events-archive/2014_03_06_cpc_review_en.htm.

2.5. Number of lorry and bus/coach driving licences and professional qualifications in Finland

The latest statistics on currently valid driving licences are from 1 July in the current year. Figures for the situation as at 31 December 2014 will be available in late January 2015.

On 1 July 2014, there were about 1,197,000 valid lorry and bus/coach driving licences in Finland. Of these, about 1,000 were held by drivers aged 18, about 2,700 by drivers aged 19 and about 65,000 by drivers aged 20 to 24. The driving licences of 25-year-old drivers are included in the 25–34 age group, which accounted for nearly 90,000 of the valid lorry and bus/coach driving licences. (See Table 1 on the following page.)

The number of valid lorry and bus/coach driving licences had decreased from about 1,222,000 in summer 2013.

It is not possible to compile a longer time series on valid heavy vehicle driving licences, because the groupings in the statistics for earlier years are different. Previously, the groupings for valid lorry and bus/coach driving licence statistics were BC, BD, ABC, C1E, CE, D1&D1E, D&DE and CE&DE.

A change to driving licence statistics groupings was made in January 2013, when the old transport information system (LTJ) was discontinued and the new driving licence register as part of the Vehicular and Driver Data Register (ATJ) was adopted.

According to data published by Trafi in October 2014, 107,000 drivers had applied for the further training for professional qualification for lorry or bus/coach drivers by the September 2014 deadline.

The number of drivers who would need to complete such training was not known in advance but had been estimated at between 80,000 and 100,000.

[12] European Commission 2013. Public consultation. Directive 2003/59/EC on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers. http://ec.europa.eu/transport/road_safety/take-part/public-consultations/cpc_en.htm.

Table 1. Number of valid lorry and bus/coach driving licences on 1 Jul 2014, 1 Jan 2014 and 6 Aug 2013; all valid driving licences and separate figures for ages 18 and 19 and age groups 20–24 and 25–34. *Source: Trafi and Statistics Finland.*[13]

Date	Age	C1 or C	C1E or CE	D1 or D	D1E or DE	Total
1 Jul 2014	**All**	876,948	231,302	54,112	34,341	1,196,703
	18	869	185	18	0	1,072
	19	2,051	577	51	0	2,679
	20–24	50,478	14,285	613	287	65,663
	25–34	74,207	13,693	1,390	655	89,945
1 Jan 2014	**All**	887,732	233,729	54,076	34,696	1,210,233
	18	873	62	2	0	937
	19	2,591	457	46	0	3,094
	20–24	55,280	13,804	541	270	69,895
	25–34	74,510	13,575	1,469	736	90,290
6 Aug 2013	**All**	896,253	236,567	54,246	34,992	1,222,058
	18	1,125	124	8	0	1,257
	19	2,825	600	47	3	3,475
	20–24	59,066	13,507	538	264	73,375
	25–34	74,480	13,528	1,555	808	90,371

[13] Trafi and Statistics Finland. Valid driving licences by grouping as at 1 Jul 2014, 1 Jan 2014 and 6 Aug 2013. Driving licence statistics no. 3.

3. STUDIES ON ACCIDENTS AND SAFETY IN HEAVY TRAFFIC AND PROFESSIONAL TRANSPORT

3.1. Finnish studies

Recent information on the overall safety of heavy traffic and trends in recent years is available in the review *Finnish Road Traffic 2014 – Safety and environmental impacts* published by Trafi in September 2014. This review examines the number of heavy traffic accidents and the number of injuries and fatalities in them, and also trends in the drive-kilometres of heavy traffic and the number of heavy vehicles registered.[14]

In recent years, fatal accidents in heavy traffic and professional transport have been studied on the basis of material from road accident investigation teams in a review in the LINTU research programme in 2009,[15] in a Trafi publication in 2011[16] and in a joint publication by Trafi and the Traffic Safety Committee of Insurance Companies (VALT) in spring 2014.[17]

These studies highlight the age and/or experience of the driver as a contributing factor to accidents. There is no detailed analysis of this, however. The following is a brief review of what the aforementioned studies have to say about the age and/or experience of the driver.

The material for the **LINTU publication**[18] comprised all fatal heavy traffic accidents between 2002 and 2006. During the period examined, there were 556 such accidents, involving 597 heavy vehicle drivers.

The study points to **driver inexperience as an emerging risk.**

> *"Numerous persons were identified in the dataset who had the appropriate driving rights but who were inexperienced in handling the type of vehicle or the type of transport involved. Accidents involving inexperienced drivers demonstrate, in individual cases, not only the lack of professional competence on the part of the driver but also deficiencies in the instruction and supervision given to drivers in their jobs. Considering that the transport sector has a shortage of drivers and that the populous age groups are retiring, more attention should be paid to the instruction of new drivers in all types of transport.*
>
> *Although professional qualification requirements are being introduced in the transport sector, and although training will, in the future, ensure that every new heavy vehicle driver has a basic level of competence, the need*

[14] *Finnish Road Traffic 2014 – Safety and environmental impacts*. In Finnish: http://pinnalla.trafi.fi/e-julkaisut/suomen_tieliikenteen_tila_2014/, in English: http://pinnalla.trafi.fi/e-julkaisut/finnish_road_traffic_2014/

[15] Vehmas, A., Ojala, T. & Seimelä, K. 2009. *Raskaan liikenteen onnettomuudet tutkijalautakunta-aineistossa – Riskit ja turvallisuusehdotukset*. LINTU-julkaisuja 2/2009. [Heavy traffic accidents in the road accident investigation team materials – Risks and safety recommendations. LINTU publications 2/2009.] http://www.lintu.info/RASLON.pdf.

[16] Laapotti, S. & Peräaho, M. 2011. *Ammattiliikenteen kuolonkolarit ja niiden riskitekijät*. Trafin julkaisuja 10/2011. [Fatal accidents in commercial road traffic and their risk factors. Trafi publications 10/2011.] http://www.trafi.fi/filebank/a/1322207626/4350f1323a319e4fd2c341912ccdb304/1652-Trafin_julkaisuja_10-2011_-_Ammattiliikenteen_kuolonkolarit.pdf.

[17] Rajamäki, R., Luoma, J. & Kallberg, V.-P. 2014. *Perusohjeita ja -tietoja liikenneonnettomuuksien tutkijalautakuntien keräämän onnettomuusaineiston käytöstä tutkimuksissa. Esimerkkinä raskaan liikenteen onnettomuudet*. Liikennevakuutuskeskus, vakuutusyhtiöiden liikenneturvallisuustoimikunta VALT ja Trafi. [Basic instructions and information on the use of accident material compiled by road accident investigation teams in research. Example: heavy traffic accidents. Finnish Motor Insurers' Centre, Traffic Safety Committee of Insurance Companies (VALT) and Trafi.] http://www.lvk.fi/templates/vinha/services/download.aspx?fid=320818&hash=7648cacfbca558f1b1c03805cd6210dbde9ea2bece43855b4356fd7008c91bcc.

[18] Vehmas, Ojala & Seimelä 2009.

> *for job-specific instruction will not decrease. Having the appropriate right to drive does not mean that a driver will automatically be competent in a new workplace, in a new vehicle or in a new type of transport."*

The material for the **Trafi research publication**[19] comprised all fatal professional transport accidents between 2000 and 2009. The professional transport category included heavy passenger and goods vehicles and taxis. During the period examined, there were 223 accidents involving lorries, 551 involving vehicle combinations, 125 involving buses/coaches and 30 involving taxis.

A professional driver was the participant causing the accident in approximately one in five motor vehicle accidents and in just over one third of pedestrian/cyclist accidents. However, there were considerable differences by vehicle type in pedestrian/cyclist accidents; nearly half of the lorry drivers involved were the participants causing the accident.

Young under 25-year-olds and over 54-year-old professional drivers were more often the participant causing the accident of accident on average. The main risk factor for young drivers was speeding, while for older drivers it was health.

The drivers involved in lorry accidents were on average very experienced. However, the participant causing the accidents (A participants) were on average less experienced drivers than the opposite parties (B participants). The average driving experience in motor vehicles was more than 600,000 km for A participants and more than 900,000 km for B participants.[20] Less than 100,000 km of driving experience in motor vehicles was recorded for 25 % of A participants and 5 % of B participants.

The drivers involved in heavy vehicle combination accidents were on average very experienced. The average driving experience in motor vehicles was more than 1.1 million km for A participants and more than 1.3 million km for B participants. Less than 100,000 km of driving experience in motor vehicles was recorded for about 6 % of A participants and about 2 % of B participants.

In heavy vehicle combination accidents, a relatively higher number of accidents where the driver was the participant causing the accident (A participants and individual accidents) was recorded in both the youngest age group (18–24) and the oldest age group (55+) than in other age groups.

The study concluded that the **lack of skills or knowledge were relatively seldom risk factors among professional drivers.** Speeding and not wearing a seat belt were more common risk factors for professional drivers than other drivers involved in accidents.

> *"Driver-related risk factors were rarer among professional drivers relative to other drivers. Alcohol was virtually absent from professional driver accidents. Lack of skills or knowledge were relatively seldom risk factors among professional drivers.*
>
> *In contrast, in motor vehicle collisions the incidence of speeding was higher among professional vehicle drivers than other drivers, with the exception of pedestrian traffic accidents. Speeding reduces the ability of all parties to avoid accidents and worsens the consequences of accidents.*
>
> *Another risk factor more common among professional drivers was failure to use a seat belt. Within the professional drivers category, driver health was also a key risk factor particularly among lorry drivers and, in pedestrian*

[19] Laapotti & Peräaho 2011.

[20] Including all motor vehicles, not only heavy vehicles.

traffic accidents, also bus drivers. The higher number of traffic offences in professional driver histories also indicates higher risk-taking driving behaviour among professional drivers."

The purpose of the joint publication by **Trafi and the Traffic Safety Committee of Insurance Companies (VALT)**[21] published in spring 2014 was to give basic instructions and information on the use of the material compiled by road accident investigation teams in studies. This publication uses as its data the heavy traffic accidents that occurred between 2002 and 2011.

In this material, 1 % of the bus/coach drivers and 13 % of the lorry drivers involved in heavy traffic accidents were aged 18–24 (see Table 2). The report does not analyse the accidents by driver age in any more detail.

The material includes all heavy traffic accidents, not just those involving professional drivers. This material was used as a control in the present analysis of young professional drivers. The procedure is described in more detail in section 4.3.

Table 2. Age distribution of drivers in fatal heavy traffic accidents between 2002 and 2011. *(Source: Rajamäki, Luoma & Kallberg 2014.)*

Age	Bus/coach	Lorry
Under 18	0 %	0 %
18–24	1 %	3 %
25–34	12 %	24 %
35–44	31 %	26 %
45–54	31 %	24 %
55–64	23 %	12 %
65–74	3 %	1 %
Over 75	0 %	0 %

Two articles by Finnish scientists on fatal heavy traffic accidents – Häkkänen & Summala:[22] *Fatal traffic accidents among trailer truck drivers and accident causes as viewed by other truck drivers* (2001); and Summala & Mikkola:[23] *Fatal accidents among car and truck drivers: effects of fatigue, age and alcohol consumption* (1994) – are included in an international literature review published in 2010, discussed in the following section.

[21] Rajamäki, Luoma & Kallberg 2014.

[22] Häkkänen, H. & Summala, H. 2001. 'Fatal traffic accidents among trailer truck drivers and accident causes as viewed by other truck drivers.' *Accident Analysis and Prevention* 33 (2001) 187–196.

[23] Summala, H. & Mikkola, T. 1994. 'Fatal accidents among car and truck drivers: effects of fatigue, age and alcohol consumption.' *Human Factors* 36 (2) 315–326.

Other Finnish studies of heavy traffic safety and accidents

In previous years, heavy traffic safety and accidents have been examined for instance in the following publications of the LINTU[24] research programme, the Ministry of Transport and Communications (LVM) and the predecessor of Trafi, the Finnish Vehicle Administration (AKE):

- Raskaiden ajoneuvojen kunnon ja kuorman vaikutus liikenneturvallisuuteen. Ajoneuvohallintokeskuksen tutkimuksia ja selvityksiä 1/2009. Metropolia Ammattikorkeakoulu.[25]
- Liikennejärjestelmän kolariväkivalta. Kolarikuolemat taajamissa: liikennekuolemien yleiskuva ja kevyen liikenteen syväanalyysi. LINTU-julkaisuja 5/2008. Kelkka, M., Ernvall, T., Keskinen, E., Kari, T., Katila, A., Laapotti, S. Olkkonen, S., Rajamäki, R., Räty, E., Virtanen, A., Hernetkoski, K. & Suhonen. K.[26]
- Tievarsitarkastusten vaikuttavuus. Ajoneuvohallintokeskuksen tutkimuksia ja selvityksiä 11/2007. Malmivuo, M. & Sihvola, N.[27]
- Raskaan ajoneuvon kuljettajien ajo-oikeuden hankintakanavat ja liikenneturvallisuus. Ajoneuvohallintokeskuksen tutkimuksia ja selvityksiä 7/2007. Laapotti, S., Hernetkoski, K., Katila, A. & Keskinen, E.[28]
- Ammattikuljettajien soveltuvuuden arviointi. Raskaan kaluston kuljettajien soveltuvuuden arviointimahdollisuudet ammattipätevyyden yhteydessä. Ajoneuvohallintokeskuksen tutkimuksia ja selvityksiä 5/2007. Vehmas, A., Seimelä, K., Herkkola, H. & Ojala, T.[29]
- Liikennerikosten vaikutus liikennelupiin raskaassa liikenteessä. LINTU-julkaisuja 2/2007. Ojala, T.[30]
- Liikennejärjestelmän kolariväkivalta. Riskit ja niiden vähentäminen autoliikenteessä yksiajorataisilla pääteillä. LINTU-julkaisuja 3/2006. Kelkka, M., Räty, E., Olkkonen, S., Juurinen, M-T., Kari, T. & Laakso, K.[31]
- Talviajan nopeudet ja raskas liikenne. Liikenne- ja viestintäministeriön julkaisuja 67/2004. Peltola, H., Rajamäki, R. & Malmivuo, M.[32]

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[24] LINTU is a long-term research and development programme for road safety financed by the Ministry of Transport and Communications, Finnish Transport Agency and Finnish Transport Safety Agency. The programme is based on a road safety vision adopted by the Government: The road transport system must be designed so that nobody should die or be seriously injured on the roads. http://lintu.info/english.htm

[25] http://www.trafi.fi/filebank/a/1321969233/b139049abaa9471c9e7211dc1a4da2b9/1289-AKE109Raskaidenajoneuvojenkunnonjakuormanvaikutusliikenneturvallisuuteen.pdf

[26] http://www.lintu.info/KOLKUTA.pdf

[27] http://www.trafi.fi/filebank/a/1321969236/818e0964e1805ab46db1a42f52c6772b/1292-AKE1107Tienvarsitarkastukset.pdf

[28] http://www.trafi.fi/filebank/a/1321969249/98f71df5b51d07a75535159b1865006d/1312-AKE707Raskaankalustonkuljettajienajooikeudenhankintakanavat.pdf

[29] http://www.trafi.fi/filebank/a/1321969246/5c24cce5d996680e333a763e82d322d6/1308-AKE507Ammattikuljettajiensoveltuvuudenarviointi.pdf

[30] http://www.lintu.info/VALLULINKKI.pdf

[31] http://www.lintu.info/VIOLA.pdf

[32] http://www.lvm.fi/fileserver/Julkaisuja%2067_2004.pdf

3.2. International studies

Relatively few international research findings on the accident risk and involvement in accidents of young and novice professional heavy vehicle drivers are available. Information is fairly well available on accidents involving professional drivers and their accident risks in general, but analyses by driver age and/or experience are rare.

A literature review on the topic was jointly published by researchers from the USA and Australia in 2010.[33] This review covered all national and international peer-reviewed scientific articles.

The motive for the review was the looming shortage of professional heavy vehicle drivers in Australia. [A similar shortage will become a real threat in several European countries in the near future.[34]] The purpose of the literature review was to explore whether it would make more sense for traffic safety and for transport businesses to encourage ageing drivers to stay at work longer or to recruit younger drivers to replace them. The review also addressed other factors that contribute to accidents involving heavy vehicle drivers.

The review concluded that **heavy vehicle drivers aged under 27 and over 63 have a higher accident risk** than drivers aged between those limits. According to one study included in the review, a driver's accident risk in driving at night remains elevated until the age of 35.[35]

Other contributing factors to heavy traffic accidents cited included: long shifts and resulting fatigue; shortcomings in the employer's safety practices and culture; and vehicle configurations (especially if there is more than one trailer, as in the "road train" vehicle combinations common in Australia).

In the conclusions to the review, it is noted that **a more detailed study of the accidents where heavy vehicle drivers were the participant causing the accident and their background risk factors would yield a better understanding** of the risks involved with young drivers on the one hand and elderly drivers on the other.

In another study published in 2014,[36] the same two Australian researchers and one from the USA analysed the accident risk of professional heavy vehicle drivers (excluding buses/coaches) by age. The purpose was to find out whether, when threatened by a driver shortage, it is justifiable to encourage ageing professional drivers to continue working for as long as it is safely feasible.

The study focused on accidents leading to vehicle damage or personal injury or fatalities between 1999 and 2006 where a professional heavy vehicle driver was the participant causing the accident. The material included accidents occurring in the state of New South Wales in Australia. Women drivers were excluded, because there were only 52 of them, leaving 12,500 accidents in the dataset. The number of accidents was measured against the number of kilometres driven.

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[33] Duke, J., Guest, M. & Boggess, M. 2010. 'Age-related safety in professional heavy vehicle drivers: A literature review.' *Accident Analysis and Prevention* 42 (2010) 364–371.

[34] E.g. http://theloadstar.co.uk/fta-cpc-driver-shortage and http://www.maaseuduntulevaisuus.fi/politiikka-ja-talous/raskaan-liikenteen-kuljettajista-voi-tulla-pula-1.26624.

[35] Campbell, K. L. 1991. 'Fatal accident involvement rates by driver age for large trucks.' *Accident Analysis and Prevention* 23 (4), 287–295.

[36] Duke, J., Boggess, M. & Guest, M. 2014. 'Age related annual crash incidence rate ratios in professional drivers of heavy goods vehicles.' *Transportation Research* Part A 65 (2014) 1–8,

While the focus of the study was on ageing drivers, the findings also reveal the accident risk of young drivers. **Young drivers up to the age of 34 caused more accidents resulting in property damage or personal injury per million kilometres driven** than drivers of any other age. The accident rates for the various age groups are shown in Table 3 by vehicle size. The original descriptions of the vehicle categories are given after the table.

Table 3. Accident rates (accidents per 1 million km) for professional heavy vehicle drivers who were the participant causing the accident of accidents, by driver age, in New South Wales in Australia between 1996 and 2006. *(Source: Guest, Bogges & Duke 2014.)*

Age group	Accident rate (accidents per 1 million km)
Rigid trucks*	
18–20	1.12
21–25	0.67
26–34	0.50
35–44	0.30
45–54	0.25
55–64	0.32
65+	0.19
Articulated trucks**	
21–25	2.25
26–34	1.19
35–44	0.63
45–54	0.52
55–64	0.55
65+	0.74

* Rigid trucks exceeding 4.5 tonnes gross vehicle mass, constructed with a load carrying area; includes light rigid, medium rigid and heavy rigid trucks.
** Articulated trucks constructed primarily for load carrying, consisting of a prime mover and turntable device which is linked to semi-trailer; includes heavy and multiple combination vehicles (e.g. road train).

4. INVOLVEMENT OF YOUNG PROFESSIONAL HEAVY VEHICLE DRIVERS IN FATAL ACCIDENTS

4.1. Definitions

The following definitions are used in the material from the road accident investigation teams that was used for the present analysis:[37] [38]

Fatal motor vehicle accident

Any motor vehicle[39] accident causing injury that results in the death of at least one occupant of a vehicle involved.

Fatal pedestrian/cyclist accident

A collision between

a) a pedestrian/cyclist and a motor vehicle, or

b) a pedestrian/cyclist and a cyclist, or

c) a single-bicycle accident that results in the death of at least one pedestrian/cyclist.

Single-pedestrian accidents (e.g. slipping) are excluded.

Multiple-vehicle accident

An accident involving at least two participants.

Single-vehicle accident

An accident involving only one participant; also covers animal accidents.

Participant involved

A road user involved in an accident as a motor vehicle driver, cyclist or pedestrian.

Participant causing the accident

A participant who, according to the road accident investigation team, was the main contributor to the accident.

Collision partner

A participant who, according to the road accident investigation team, contributed less to the accident.

[37] Finnish Motor Insurers' Centre 2014. *VALT-vuosiraportti 2013. Liikenneonnettomuuksien tutkijalautakuntien tutkimat kuolemaan johtaneet tieliikenneonnettomuudet*. Liikennevakuutuskeskus, vakuutusyhtiöiden liikenneturvallisuustoimikunta (VALT). [VALT annual report. Fatal road accidents investigated by road accident investigation teams. Finnish Motor Insurers' Centre, Traffic Safety Committee of Insurance Companies (VALT).] http://www.lvk.fi/templates/vinha/services/download.aspx?fid=325686&hash=3141bc6855d5526551e708309d020dc906e68c0fea9b63ba92e83b97f660f6ad.

[38] Rajamäki, Luoma & Kallberg 2014.

[39] See the Vehicle Act. In Finnish http://www.finlex.fi/fi/laki/ajantasa/2002/20021090, in Swedish: http://www.finlex.fi/sv/laki/ajantasa/2002/20021090

Key event

The key event is an occurrence, change or deviation in the normal flow of traffic that occurred immediately before the accident and made the accident possible, e.g. “vehicle drifted into oncoming traffic”.

Immediate risk factor

The immediate risk factor is a risk factor which had an active effect in the immediate proximity of the accident in terms of place and time and which actively contributed to the accident. A road accident investigation team defines one immediate risk factor for every driver (including cyclists) or pedestrian involved in an accident.

Examples of immediate risk factors:

a) road user related: falling asleep, braking error, faulty line, error of judgment;

b) vehicle related: steering failure, tyre puncture; and

c) road environment related: collapse of road shoulder, unusual and unexpected slipperiness.

Background risk factor

A background risk factor explains and enables the emergence of the immediate risk factor. Road accident investigation teams evaluate underlying risk factors on the basis of the investigation conducted.

Examples of underlying risk factors:

a) road user related: fatigue, intoxication, careless attitude, speeding;

b) vehicle related: incorrect tyre pressures, wind-prone vehicle, blind spots;

c) road environment related: condition of the road surface, structure of the intersection, collision objects; or

d) transport system related: penal provisions or vehicle requirements.

Damage and factors which affected the consequences

Risk factors which did not affect the origin of the accident but which for their part made the consequences of the accident worse.

Safety improvement recommendation (improvement proposals and safety recommendations)

A road accident investigation team suggests actions and measures to improve safety so that similar accidents could be prevented or their consequences mitigated in the future. Recommendations are divided into categories just like the risk factors: road user related, vehicle related, road environment related and transport system related.

The investigation team seeks to identify at least one improvement recommendation for each immediate risk factor and underlying risk factor. The improvement recommendations do not have to be feasibly capable of immediate implementation; they may envision a situation further in the future.

4.2. Material and method

The material for the present analysis comprises the fatal motor vehicle accidents and pedestrian/cyclist accidents between 2000 and 2013 where a professional heavy vehicle driver aged 18–25 was involved.[40] [41]

The material was extracted from the material obtained from road accident investigation teams using the variable *principal purpose of journey*, those accidents being included where the principal purpose of the journey was *professional transport.* Those accidents were excluded where the principal purpose of the journey was professional travel (e.g. sales representatives).

Section 4.3 discusses the **involvement of professional heavy vehicle drivers aged 18–25 in fatal accidents between 2000 and 2013.**

These are compared to all fatal accidents in heavy traffic between 2002 and 2011 and their drivers, as applicable. A report on the latter was jointly published by Trafi and the Traffic Safety Committee of Insurance Companies (VALT) in May 2014, as described above in section 3.1.[42]

That material included 816 accidents involving lorries (including vehicle combinations), 112 accidents involving buses/coaches, and a further five accidents involving both a lorry and a bus/coach. In this material, about 10 % of the lorry drivers and about 3 % of the bus/coach drivers were not professional drivers.

Section 4.4 discusses in case-study fashion those fatal accidents where a professional driver aged 18–25 was the **participant causing the accident,** or **"A participant".** Accidents **between 2006 and 2013** were examined. This was mostly based on the public investigation report written up by the road accident investigation team for each accident.

The case study was not extended to accidents before 2006, because the investigation folders for those accidents had been relocated from the archives of the Motor Insurers' Centre. It would have been possible to order those folders for examination, but because the analysis was intended to be a brief one, the case study was not extended to include accidents before 2006.

4.3. Fatal accidents involving a young professional driver between 2000 and 2013

Between 2000 and 2013, there were 167 fatal road accidents involving a professional heavy vehicle driver aged 18–25. Of these, 137 were motor vehicle accidents and 30 were pedestrian/cyclist accidents.

Those 137 accidents involved a total of 140 professional heavy vehicle drivers aged 18–25; three accidents involved two drivers in that category. However, the latter three accidents are only included once in the analysis, according to the young professional driver who was deemed the participant causing the accident.

The young professional driver involved was driving a bus/coach in only four of the accidents. In all others, the young professional driver was driving a lorry or a truck-trailer combination.

[40] Coaches and lorries with attached trailers.

[41] VALT 2014. *Liikenneonnettomuuksien tutkijalautakuntien tutkimien tie- ja maastoliikenneonnettomuuksien onnettomuustietorekisteri*. Liikennevakuutuskeskus, Vakuutusyhtiöiden liikenneturvallisuustoimikunta (VALT). [Accident data register for the road and terrain accidents investigated by road accident investigation teams. Traffic Safety Committee of Insurance Companies (VALT).]

[42] Rajamäki, Luoma & Kallberg 2014.

Figure 1 below shows that there was considerable annual random variation in the number of accidents. The highest annual number of accidents, 17, was recorded in 2008.

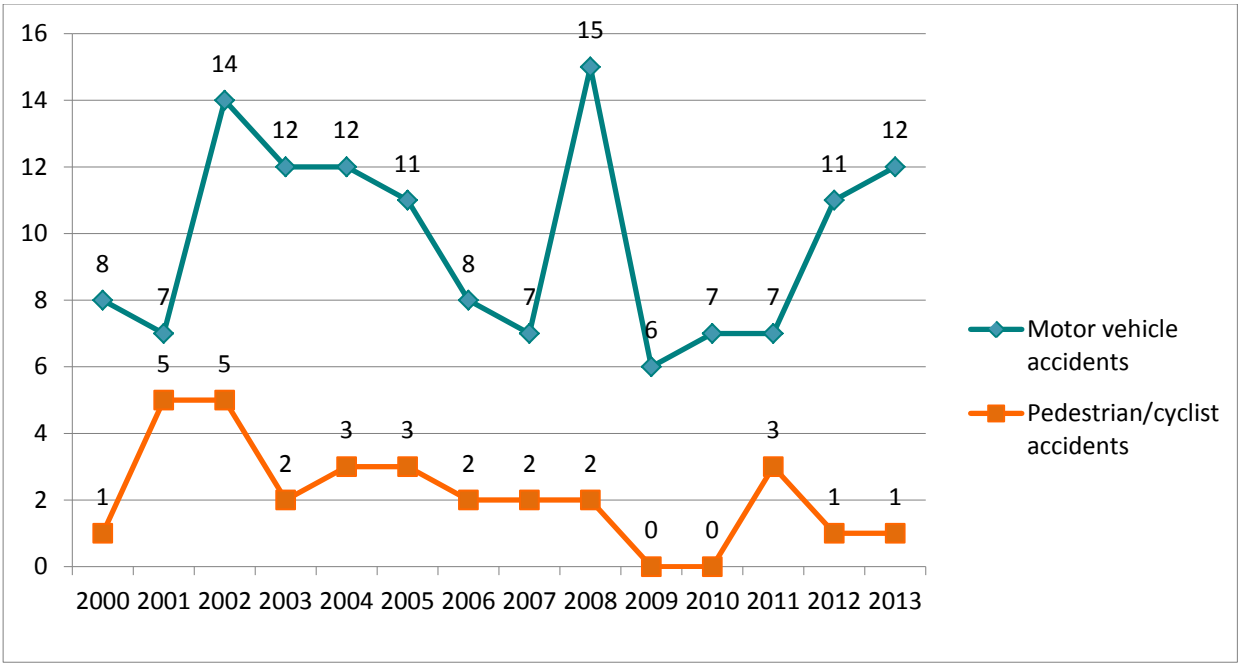

Figure 1. Fatal motor vehicle accidents and pedestrian/cyclist accidents where a professional heavy vehicle driver aged 18–25 was involved. Accidents between 2000 and 2013. *(Source: VALT/LVK.)*

In the material analysed, a professional heavy vehicle driver aged 18–25 was the "A participant" or participant causing the accident in 27 % of fatal motor vehicle accidents. This figure includes four individual accidents. A young professional heavy vehicle driver was the participant causing the accident in 33 % of the fatal pedestrian/cyclist accidents.

In all heavy traffic accidents that occurred between 2002 and 2011, the lorry or bus/coach driver was the "A participant" or participant causing the accident in 22 % of the motor vehicle accidents and 18 % of the pedestrian/cyclist accidents. However, that material includes all accidents involving a lorry or bus/coach, i.e. also those involving non-professional drivers. As noted above in section 4.2., in that material about 10 % of the lorry drivers and about 3 % of the bus/coach drivers were not professional drivers.[43]

The distribution of the type of involvement (participant causing the accident or collision partner) among professional drivers aged 18–25 and all heavy vehicle drivers in fatal motor vehicle accidents and pedestrian/cyclist accidents is shown in Figures 2 and 3 below.

[43] Rajamäki, Luoma & Kallberg 2014.

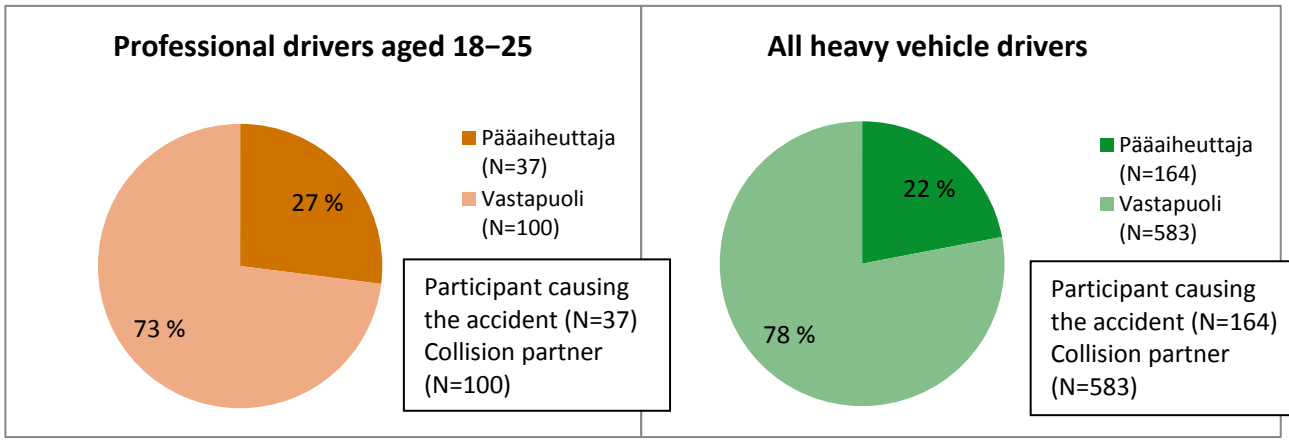

Figure 2. Fatal motor vehicle accidents by driver involvement (participant causing the accident or collision partner). Professional heavy vehicle drivers aged 18–25 between 2000 and 2013 shown in orange ; all heavy vehicle drivers between 2002 and 2011 shown in green. *(Source: VALT/LVK; Rajamäki, Luoma & Kallberg 2014.)*

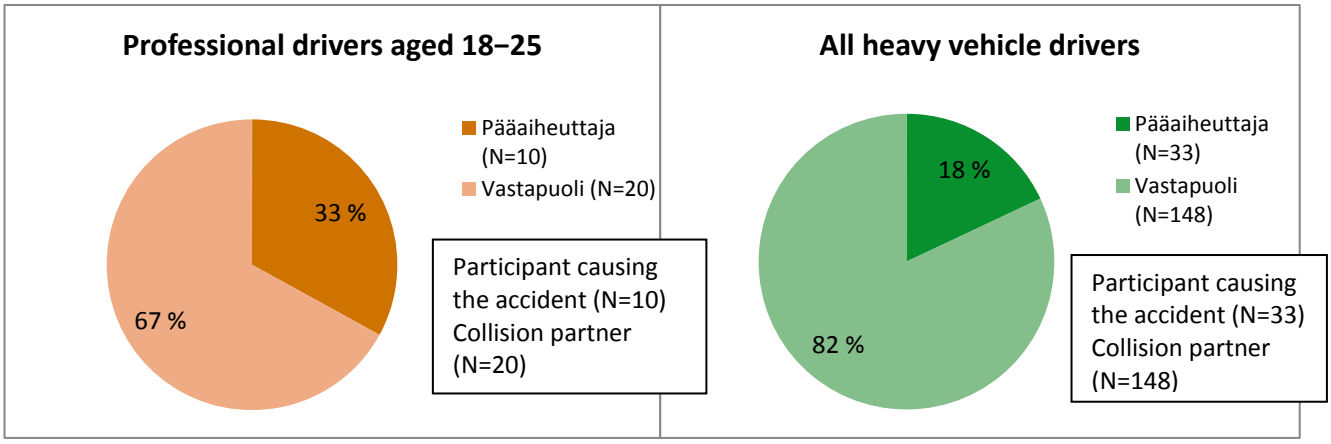

Figure 3. Fatal pedestrian/cyclist accidents by driver involvement (participant causing the accident or collision partner). Professional heavy vehicle drivers aged 18–25 between 2000 and 2013 shown in orange ; all heavy vehicle drivers between 2002 and 2011 shown in green. *(Source: VALT/LVK; Rajamäki, Luoma & Kallberg 2014.)*

The fatal accidents between 2006 and 2013 where professional heavy vehicle drivers aged 18–25 were the **participant causing the accident** are discussed in more detail in section 4.4.

4.3.1. Accident types

In the material analysed, the **majority** (52 %) of the fatal **lorry** accidents involving professional heavy vehicle drivers aged 18–25 were **head-on collisions** (opposite driving directions).

The next largest type (10 %) was intersection collisions. All other accident types had a percentage clearly under 10 %. (Table 4.)

The distribution of accident types in all fatal lorry accidents between 2002 and 2011 was similar to that in accidents involving young professional drivers. Out of all lorry accidents, 54 % were head-on collisions and 9 % were intersection collisions.[44]

[44] Rajamäki, Luoma & Kallberg 2014.

Between 2000 and 2013, professional heavy vehicle drivers aged 18–25 were involved in only four **bus/coach** accidents. The accident types of these four accidents are shown in Table 4.

Among all fatal bus/coach accidents between 2002 and 2011, the most common accident types were head-on collisions (27 %) and pedestrian accidents (18 % on crosswalks, 12 % not on crosswalks).[45]

Table 4. Accident types by vehicle category in fatal accidents involving a professional heavy vehicle driver aged 18–25 between 2000 and 2013. *(Source: VALT/LVK.)*

	Lorry accidents (no.)	%	Bus/coach accidents (no.)	%
00–09 Same driving direction, no turning	12	7.4		
10–19 Same driving direction, with turning	10	6.1		
20–29 Opposite driving directions (head-on)	**85**	**52.1**	1	25.0
30–39 Opposite driving directions, with turning	5	3.1	1	25.0
40–49 Intersecting driving directions	16	9.8		
50–59 Intersecting driving directions, with turning	9	5.5		
60–69 Pedestrian on crosswalk	7	4.3	**2**	**50.0**
70–79 Pedestrian not on crosswalk	11	6.7		
80–89 Running off road	4	2.5		
90–99 Other accident	4	2.5		
Total	**163**		**4**	

In analysing motor vehicle accidents and pedestrian/cyclist accidents by accident type, **head-on collisions** (opposite driving directions) are by far the most common accident type in motor vehicle accidents involving professional heavy vehicle drivers aged 18–25, with a percentage of more than 60 %. All other accident types had a percentage clearly under 10 %.

In pedestrian/cyclist accidents, **pedestrian accidents** (pedestrian on or off crosswalk) are by far the most common accident type, with a percentage of more than 60 %.

The detailed distributions of accident types are shown in Table 5.

In the report on all fatal heavy traffic accidents between 2002 and 2011, no accident type analysis was given separately for motor vehicle accidents on the one hand and pedestrian/cyclist accidents on the other.[46]

[45] Rajamäki, Luoma & Kallberg 2014.
[46] Rajamäki, Luoma & Kallberg 2014.

Table 5. Accident types by category in fatal motor vehicle and pedestrian/cyclist accidents involving a professional heavy vehicle driver aged 18–25 between 2000 and 2013. *(Source: VALT/LVK.)*

	Motor vehicle accidents (no.)	%	Pedestrian/cyclist accidents (no.)	%
00–09 Same driving direction, no turning	11	8.0	1	3.3
10–19 Same driving direction, with turning	10	7.3	0	0.0
20–29 Opposite driving directions (head-on)	**86**	**62.8**	0	0.0
30–39 Opposite driving directions, with turning	3	2.2	3	10.0
40–49 Intersecting driving directions	12	8.8	4	13.3
50–59 Intersecting driving directions, with turning	9	6.6	0	0.0
60–69 Pedestrian on crosswalk	0	0.0	9	**30.0**
70–79 Pedestrian not on crosswalk	0	0.0	**11**	**36.7**
80–89 Running off road	4	2.9	0	0.0
90–99 Other accident	2	1.5	2	6.7
Total	**137**		**30**	

4.3.2. Right to drive

All of the young professional drivers in the material analysed had a valid and sufficient right to drive at the time of the accident except one. For the one exception, there is no information on the validity of the right to drive in the system, and it is therefore possible that that driver too had a valid right to drive.

In the report on all fatal heavy traffic accidents between 2002 and 2011, no analysis was made of the validity and sufficiency of the drivers' right to drive at the time of the accident.[47]

4.3.3. Driving times and rest periods

The driving times and rest periods for lorry and bus/coach drivers in road traffic are uniformly regulated throughout Europe. These provisions apply in the European Union and the European Economic Area (EEA).

They are derived from Regulation (EC) No 562/2006 of the European Parliament and of the Council of 15 March 2006,[48] providing for the driving times, breaks and rest periods for drivers in goods and passenger road transport.

The purpose of the Regulation is to improve the working conditions of professional drivers and to reduce the risk of road accidents. The provisions on driving times and rest periods are intended to ensure sufficient alertness while driving and sufficient rest and leisure time for recovery from work.

[47] Rajamäki, Luoma & Kallberg 2014.

[48] Eurlex: Regulation (EC) No 561/2006 of the European Parliament and of the Council of 15 March 2006 on the harmonisation of certain social legislation relating to road transport and amending Council Regulations (EEC) No 3821/85 and (EC) No 2135/98 and repealing Council Regulation (EEC) No 3820/85 (Driving Time and Rest Period Regulation). http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32006R0561:FI:HTML.

According to the Regulation:
- the daily driving time shall not exceed nine hours,
- the weekly driving time shall not exceed 56 hours,
- the total accumulated driving time during any two consecutive weeks shall not exceed 90 hours,
- after a driving period of 4.5 hours, a driver shall take an uninterrupted break of not less than 45 minutes,
- the daily rest period shall be at least 11 hours, and
- the weekly rest period shall be at least 45 hours.

Information on the application of the Regulation may be found for instance at the Occupational Safety and Health Administration website at http://www.tyosuojelu.fi/tyosuhde/autonkuljettajan-tyoaika (in Finnish) or http://www.tyosuojelu.fi/web/sv/anstallningsforhallande/bilforares-arbetstider (in Swedish).

In the material analysed, **6 % of the lorry drivers aged 18–25 involved in fatal accidents between 2000 and 2013 had not complied with statutory driving times and rest periods** prior to the accidents. All of the four bus/coach drivers involved in such accidents had complied with the statutory driving times and rest periods. (Table 6.)

By comparison, the report on all fatal heavy traffic accidents between 2002 and 2011 found that 7 % of lorry drivers and 2 % of bus/coach drivers had not complied with the statutory driving times and rest periods.[49]

However, it should be noted when examining the data in Table 6 that the percentage of "Not known or blank" is considerably higher for professional drivers aged 18–25 than for the report on all fatal heavy traffic accidents because this variable was not introduced until 2002.

Table 6. Compliance with provisions on driving times and rest periods by heavy vehicle drivers involved in fatal accidents. Separately for professional drivers aged 18–25 in the present analysis (between 2000 and 2013) and all heavy vehicle drivers (between 2002 and 2011). *(Source: VALT/LVK; Rajamäki, Luoma & Kallberg 2014.)*

	Professional drivers aged 18–25 2000–2013		**All fatal heavy traffic accidents 2002–2011***	
	Lorry N=150	**Bus/coach** N=4	**Lorry** N=869	**Bus/coach** N=117
Not a professional driver	0 %	0 %	9 %	3 %
Did comply with statutory driving times and rest periods	71 %	100 %	73 %	8 %
Did not comply with statutory driving times and rest periods	**6 %**	**0 %**	**7 %**	**2 %**
Not known or blank	23 %	0 %	12 %	10 %

** For the data on all fatal heavy traffic accidents (2002–2011), the percentages were recalculated (unlike in the original report) to include the 'not known or blank' cases. This was justifiable, because the information was missing for 23% of the young professional drivers. The variable was not introduced until 2002.*

[49] Rajamäki, Luoma & Kallberg 2014.

Of the professional drivers aged 18–25 involved in fatal accidents, five had 1, four had 2 and one had 3 driving time and rest period infringements that had come to the attention of the police in the five years preceding the accident. This amounts to about 6% of all the drivers. The others either had no driving time and rest period infringements from the previous five years (about 67%), or else the information was not available (about 27%).

Since not all young drivers necessarily even have a driving history of five years, it is only natural that relatively fewer driving time and rest period infringements and other traffic violations were recorded for them than for more experienced drivers.

According to a report published by Trafi in 2013, 39% of professional drivers responding to a survey had been given one or more sanctions related to non-compliance with driving time and rest period regulations in the last three years.[50] The most common offences were too-long driving times, too-short daily rest periods and failure to observe the required rest stops.

4.3.4. Traffic violations

In a road accident investigation, the police officer member of the investigation team examines whether the driver has previous traffic violations that have come to the attention of the police, either by interviewing the driver himself/herself or persons close to him, or by consulting the driving licence application of the Vehicular and Driver Register.

The traffic violations considered include the driving time and rest period infringements discussed in the previous section.

About 23% of the professional heavy vehicle drivers aged 18–25 had in their driving licence record one traffic violation that had come to the attention of the police in the previous five years. Almost as many, about 22% had two violations in the previous five years, while 12% had at least five violations in the previous five years. The highest number of violations was 10, recorded for two drivers.

About one fourth of all professional heavy vehicle drivers aged 18–25 had had no traffic violations at all recorded in the previous five years.

In the study of all fatal heavy traffic accidents between 2002 and 2011, previous traffic violations by the drivers involved were not examined.[51]

Table 7. Total number of traffic violations coming to the attention of the police over the previous five years by professional heavy vehicle drivers aged 18–25 involved in fatal accidents. *(Source: VALT/LVK.)*

	N	**%**
No violations	40	24.0
1 violation	38	22.8
2 violations	36	21.6
3 violations	15	9.0
4 violations	9	5.4
More than 4 violations	20	12.0
Not known	9	5.4
	167	

[50] Salanne, I., Rönkkö, S., Tikkanen, M. & Perttula, P. 2013. *Ajo- ja lepoaikasäädösten vaikutukset*. Trafin julkaisuja 22/2013. [Impact of driving time and rest period legislation. Trafi publications 22/2013.] http://www.trafi.fi/filebank/a/1388410753/ea7ed86abe9beb74a4773eb2c3783f67/13903-Trafin_julkaisuja_22-2013_-_Ajo-_ja_lepoaikasaadosten_vaikutukset.pdf

[51] Rajamäki, Luoma & Kallberg 2014.

4.3.5. Driving speeds

The Ministry of Transport and Communications may specify a national speed limit. Road-specific and local speed limits are determined (within the guidelines issued by the Ministry as necessary) by the authority whose responsibility it is to install the traffic directing equipment. On public roads, traffic directing equipment is installed by the road maintenance authority. On streets, development plan roads, public squares and similar traffic areas, the equipment is installed by the local authority.[52]

The maximum driving speed for a lorry is 80 km/h. The maximum driving speed for a bus/coach is 80 km/h, or 100 km/h if the vehicle is approved for operation at such a speed and carries no standing passengers.[53]

Lorries and buses/coaches must by law have a speed limiter.[54] Only buses used in local traffic, rescue vehicles, police vehicles and military vehicles are exempt from this requirement. The speed limiter must be set to prevent the speed of a bus/coach from exceeding 100 km/h and the speed of a lorry from exceeding 90 km/h.[55]

In practice, the speed limiter is commonly set to a level slightly higher than the vehicle-specific maximum.[56]

The data on driving speeds in the road accident investigation team material are in many cases based on estimates derived from interviews with participants and eye witnesses and from reconstruction calculations. However, the driving speeds of lorries and buses/coaches can often be established more precisely than those of other vehicles thanks to the tachograph.

In the material analysed, **62 % of the drivers involved in fatal motor vehicle accidents were complying with the road-specific speed limit,** while 33 % of them exceeded the road-specific speed limit by no more than 20 km/h and 1 % exceeded it by more than 20 km/h.

Of the drivers involved in **fatal pedestrian/cyclist accidents, 69 % were complying with the road-specific speed limit,** while 24 % of them exceeded the road-specific speed limit by no more than 20 km/h and 3 % exceeded it by more than 20 km/h. (Table 8 on the following page.)

The vehicle-specific speed limit was exceeded (by at least 1 km/h) by 50 % of the young professional heavy vehicle drivers involved in a fatal motor vehicle accident and by 17% of those involved in a fatal pedestrian/cyclist accident.

[52] Finlex: Road Traffic Act (267/1981), 25 ja 51 §. In Finnish: http://www.finlex.fi/fi/laki/ajantasa/1981/19810267, in Swedish: http://www.finlex.fi/sv/laki/ajantasa/1981/19810267.
[53] Finlex: Decree on the Use of Vehicles on the Road (1257/1992). In Finnish: http://www.finlex.fi/fi/laki/ajantasa/1992/19921257, in Swedish: http://www.finlex.fi/sv/laki/ajantasa/1992/19921257.
[54] Finlex: Vehicle Act (1090/2002). In Finnish: http://www.finlex.fi/fi/laki/ajantasa/2002/20021090, in Swedish: http://www.finlex.fi/sv/laki/ajantasa/2002/20021090.
[55] Finlex: Decree of the Ministry of Transport and Communicaions on the Construction and Equipment of Motor Vehicles and Trailers (1248/2002). In Finnish: http://www.finlex.fi/fi/laki/ajantasa/2002/20021248, in Swedish: http://www.finlex.fi/sv/laki/ajantasa/2002/20021248.
[56] Rajamäki, Luoma & Kallberg 2014.

Table 8. Distribution of compliance with road-specific and vehicle-specific speed limits by professional drivers aged 18–25 involved in fatal motor vehicle and pedestrian/cyclist accidents between 2000 and 2013. *(Source: VALT/LVK.)*

	Motor vehicle accidents N=137	**Pedestrian/cyclist accidents** N=30
Did not exceed road-specific speed limit	62%	69%
Exceeded road-specific speed limit by 1 – 20 km/h	33%	24%
Exceeded road-specific speed limit by more than 20 km/h	1%	3%
Reversing, stopped or parked	2%	3%
Not known	1%	0%
Did not exceed vehicle-specific speed limit	47%	76%
Exceeded vehicle-specific speed limit by 1 km/h or more	50%	17%
Reversing, stopped or parked	2%	3%
Not known	1%	3%

Out of all fatal heavy traffic accidents between 2002 and 2011, 46% of lorry drivers exceeded either the road-specific or the vehicle-specific speed limit or both prior to the accident. The figure for bus/coach drivers was 21%. The report did not itemise road-specific and vehicle-specific speeds according to whether the accident was a motor vehicle accident or a pedestrian/cyclist accident.[57]

It is not feasible to analyse the driving speeds of professional heavy vehicle drivers aged 18–25 by vehicle type, because only four buses/coaches driven by such drivers were involved in fatal accidents between 2000 and 2013. Therefore the percentages in the above table (Table 8) almost wholly apply to lorries.

According to a survey conducted by the Finnish Transport Agency, the average speed in heavy traffic on Finland's main roads between 2010 and 2012 was 83.5 km/h in the summer and 81 km/h in the winter. In the summer, about 70% of heavy vehicles drove at more than 80 km/h, and about 10% at more than 90 km/h. By comparison, in the winter about 60% drove at more than 80 km/h and about 5% at more than 90 km/h.[58]

According to a more recent survey conducted by the Finnish Transport Agency, the average speed in heavy traffic on Finland's main roads between 2010 and 2013 was 83.4 km/h in the summer and 82 km/h in the winter of 2013–2014.[59]

[57] Rajamäki, Luoma & Kallberg 2014.

[58] Finnish Transport Agency 2013. *Autojen nopeudet pääteillä vuonna 2012*. Liikenneviraston tutkimuksia ja selvityksiä 26/2013. [Vehicle speeds on main roads in 2012. Finnish Transport Agency studies and reports 26/2013.] http://www2.liikennevirasto.fi/julkaisut/pdf3/lts_2013-26_autojen_nopeudet_web.pdf.

[59] Finnish Transport Agency 2014. *Autojen nopeudet maanteillä vuonna 2013*. Liikenneviraston tutkimuksia ja selvityksiä 30/2014. [Vehicle speeds on public roads in 2013. Finnish Transport Agency studies and reports 30/2014.] http://www2.liikennevirasto.fi/julkaisut/pdf8/lts_2014-30_autojen_nopeudet_web.pdf

4.3.6. Immediate risk factors

As noted above in section 4.1., the immediate risk factor is a risk factor which had an effect in the immediate proximity of the accident in terms of place and time and which actively contributed to the accident. An accident investigation team determines one immediate risk factor for every vehicle driver, cyclist and pedestrian involved in an accident.[60]

Background risk factors enable the emergence of the immediate risk factor, the key event and the injury or damage. Anyone involved in an accident may be affected by several background risk factors.[61]

In the report on all fatal heavy traffic accidents between 2002 and 2011, immediate risk factors were considered separately for lorries and buses/coaches. As noted above, the present analysis includes only four accidents involving a bus/coach, so no distinction is made here between lorries and buses/coaches driven by young professional drivers.

In both the 18–25 analysis and the report on all fatal heavy traffic accidents, the most common immediate risk factor by far was that **the participant could not avoid the accident.** This immediate risk factor was identified for **57 %** of the young professional drivers, and in the report on all fatal heavy traffic accidents for 68 % of lorry drivers and 53 % of bus/coach drivers. (Table 9 on the following page.)

In practice, "could not avoid the accident" means that the driver had too little time to react, that the danger was not apparent, or that the driver was otherwise unable to prevent the accident from occurring. In the majority of these cases, the lorry or bus/coach driver was the collision partner (opposite party) and had too little time to react to avoid the accident. Many of these accidents involved a car or motorcycle driver consciously and deliberately driving so as to cause the accident (suicidal intent).

The next most common immediate risk factor, in both the 18–25 analysis and the report on all fatal heavy traffic accidents, was 'observational errors by the participant'. This was ascribed to 16 % of the young professional drivers and to 10 % of lorry drivers and 23 % of bus/coach drivers in the report on all fatal heavy traffic accidents.

Vehicle handling errors were identified as the immediate risk factor for a slightly higher percentage of young professional drivers (7 %) than in the report on all fatal heavy traffic accidents (lorry drivers 5 %, bus/coach drivers 3 %). By contrast, the percentages of anticipation errors, errors of judgment and observational errors were slightly lower for young professional drivers than in the report on all fatal heavy traffic accidents.

Before the methodological reform of 2002, the road accident investigation teams only assessed the immediate risk factor for the participant causing the accident of the accident (the "A participant"). Because of this, the data prior to 2002 lack the immediate risk factor for accidents where a professional driver aged 18–25 was the collision partner ("B participant").

What is noteworthy for the percentages of immediate risk factors for professional drivers aged 18–25 is that in 7 % of the cases (from 2000 to 2002), no immediate risk factor was given because of the aforementioned reason. There are no missing immediate risk factor data in the report on all fatal heavy traffic accidents.

[60] Finnish Motor Insurers' Centre 2008. *Liikenneonnettomuuksien tutkintamenetelmä 2003. Muuttujaluettelo 2008*. Liikennevakuutuskeskus, liikenneonnettomuuksien tutkinta ja liikenneonnettomuuksien tutkinnan neuvottelukunta. [Road accident investigation method 2003. Variable list 2008. Finnish Motor Insurers' Centre, road accident investigation]

[61] Finnish Motor Insurers' Centre 2008.

Table 9. Immediate risk factors for lorry drivers and bus/coach drivers, percentages. Accidents between 2000 and 2013 for professional drivers aged 18–25 and accidents between 2002 and 2011 for all professional heavy vehicle drivers. *(Source: VALT/LVK; Rajamäki, Luoma & Kallberg 2014.)*

	Professional drivers aged 18-25	**All heavy traffic drivers**	
	Lorry and bus/coach* N=167	Lorry N=869	Bus/coach N=117
Vehicle handling error or driving actions	7 %	5 %	3 %
Change in the functional capacity of the participant	2 %	3 %	4 %
Anticipation error or error of judgment by the participant	8 %	10 %	11 %
Observational errors by the participant	**16 %**	**10 %**	**23 %**
Events in the road environment	1 %	0 %	0 %
Events with sudden impact on vehicle control	1 %	2 %	1 %
Participant could not avoid the accident	**57 %**	**68 %**	**53 %**
Other events	1 %	1 %	5 %
Not known / not entered into the system (2000–2002)	7 %	0 %	0 %

** The data for lorries and buses/coaches were combined for professional drivers aged 18–25, because there were only four accidents involving a bus/coach in the material.*

The groupings in the above table include immediate risk factors such as the following:

Vehicle handling errors or driving actions: Incorrect line, incorrect steering movement, braking error

Change in the functional capacity of the participant: Falling asleep, decreased alertness, seizure, loss of consciousness

Error in anticipation or judgment by the participant: Erroneous estimate of free passage, erroneous interpretation of the intentions or situation of others

Observational errors by the participant: Did not observe the other party or the situation, erroneous observation of the other party or the situation

Events in the road environment: Obstacle or animal on the road

Events with sudden impact on vehicle control: Wheel separation, load detachment or shifting, brake failure

Participant could not avoid the accident: Reaction time too short, danger not apparent, unable to prevent the accident from occurring[62]

[62] In the method reform of 2002, alternatives also applicable to the collision partner ('B participant') were added to the *immediate risk factor* variable, such as 'the participant could not avoid the accident'.

4.4. Fatal accidents between 2006 and 2013 where a young professional driver was the participant causing the accident

This section is a case-study discussion of the fatal accidents that occurred between 2006 and 2013 where a professional lorry or bus/coach driver aged 18–25 was the participant causing the accident, or "A participant" of the accident.

Motor vehicle accidents are discussed in section 4.4.1. and pedestrian/cyclist accidents in section 4.4.2.

As noted above in section 4.2., the material in this section differs from the previous in that it only covers accidents from 2006 onwards; the material for the previous section covers accidents from 2000.

There were 25 fatal accidents between 2006 and 2013 where a professional heavy vehicle driver aged 18–25 was the participant causing the accident. Of these, 19 were motor vehicle accidents and 6 were pedestrian/cyclist accidents.

Because of the small annual number of accidents, it would not make sense or even be possible to examine them statistically or to generalise the findings of the present analysis.

Accident descriptions

We present a description of each accident, its background risk factors and the major improvement suggestions and safety recommendations issued by the road accident investigation team in as much detail as is possible on the basis of the public investigation reports.

The interview form used by the police officer member of the investigation team includes questions such as the driver's total drive-kilometres in a motor vehicle, current annual drive-kilometres in a motor vehicle, total drive-kilometres in the accident vehicle and total drive-kilometres in the accident vehicle type. However, such performance data are not available for nearly all drivers. Also, the figure for total drive-kilometres in a motor vehicle is not necessarily very accurate, because the driver or his/her family member interviewed would have to know or remember all the driving ever done by the driver, beginning with a moped.

Non-public sources (including medical information on the driver and photos of the accident site) have been used to find out for instance how long the driver had had a driving licence for the relevant vehicle category prior to the accident. This information is not entered in the electronic system, and not necessarily even recorded in the investigation report. Precise information on the validity of the driver's driving licence could not always be found in the investigation folder.

If the driver was wearing a seat belt when the accident occurred, this is specifically mentioned in the description. Older heavy traffic vehicles do not necessarily even have seat belts installed.

Risks related to driver experience and recommendations for driver training

Where the investigation report mentions as a background risk factor the driver's inexperience, short time since gaining the right to drive the type of vehicle in question, the driver's young age and/or inadequate training in the vehicle, vehicle type or job type, these are entered in blue. Improvement suggestions and safety recommendations related to the driver's professional competence, inexperience and/or instruction are entered in green.

The **inexperience** of a professional heavy vehicle driver or **inadequate instruction provided** were cited as a risk factor in the investigation reports of **nine motor vehicle accidents.** The analysis included 19 motor vehicle accidents.

Driver inexperience was not cited in a single pedestrian/cyclist accident. The analysis included 6 pedestrian/cyclist accidents.

The young age of the driver was never cited as a risk factor in an accident.

Eight investigation reports on motor vehicle accidents contain improvement suggestions and safety recommendations concerning driver training, drivers' professional competence and their instruction. No similar suggestions or recommendations are found in the non-vehicular accident investigation reports.

4.4.1. Motor vehicle accidents

2006, head-on collision

Car driver dead, lorry driver uninjured.

At the time of the accident, the weather was dry and it was a light time of day. The road surface was partly icy. The temperature was almost 10 degrees below zero.

A lorry and a car collided on a main road. The lorry drifted into oncoming traffic, and a car coming the other way hit the left front corner of the lorry.

The lorry driver had had a seizure (loss of consciousness). The driver had not had a long enough daily rest (cf. driving time and rest period provisions for professional drivers). Previously during the shift, the driver had felt poorly.

The transport company had a shortage of employees. The lorry driver had begun the shift late in the previous evening and was returning to the terminal of origin after a night and a day of deliveries.

The lorry driver was aged 25 and had about 200,000 kilometres of motor vehicle driving experience, current annual drive-kilometres of about 30,000 and about 2,000 kilometres of experience in the accident vehicle.

Improvement suggestions and safety recommendations by the investigation team: Compliance with and monitoring of the driving time and rest period provisions for professional drivers. Monitoring and supervising driver alertness. Road with median barrier.

2006, head-on collision

Car driver dead, lorry driver uninjured.

The accident occurred at a dimly lit time of day. The weather was cloudy, and the temperature was just above zero. The road surface was wet and partly covered with slush.

A lorry and a car collided on a local road. The lorry driver lost control of the vehicle in a curve and drifted into oncoming traffic.

The lorry driver was driving too fast in view of the current road conditions, having driven through the night; the accident occurred on the following morning. During a shift lasting nearly nine hours, the driver had had two short breaks and one longer one.

The investigation team concluded that the 22-year-old lorry driver had little driving experience in professional transport. The driver had had the right to drive for about four years.

The lorry driver had a total of about 400,000 kilometres of driving experience in motor vehicles, current annual drive-kilometres of about 80,000 in motor vehicles and about 5,000 kilometres in the accident vehicle before the accident.

The lorry driver was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Improving professional driver training, awareness of the risks of night transports and minimising such transports, weather alert system for heavy traffic.

2006, head-on collision

Car driver dead, lorry driver uninjured.

On the day of the accident, the weather was bright and sunny. The road surface was wet, the temperature was a couple of degrees above zero.

A lorry and a car collided on a local road. The lorry driver lost control of the vehicle after the sudden blowout of a tyre. The lorry collided with the driver-side door of a car coming the other way.

There is no information on how long the 25-year-old lorry driver had had the category C right to drive prior to the accident. There is also no information on the driver's driving experience.

Improvement suggestions and safety recommendations by the investigation team: Resurfaced tyres not to be fitted on steering axles on heavy vehicles, stability control system for lorries.

2007, individual accident (running off road)

Lorry driver dead.

The accident occurred in the dark. The road surface was dry, and the temperature was a couple of degrees above zero.

The lorry ran off the road at a curve to the left. The lorry entered the curve too fast. The lorry's load shifted towards the outboard side of the curve, changing the vehicle's centre of gravity.

The 22-year-old lorry driver had not been given sufficient instruction in how to transport the unusual load.

The lorry driver had driven about 2,300 km in the vehicle in question prior to the accident. No information is available on the lorry driver's total drive-kilometres. The driver had been granted a CE category right to drive in 2005 and had been granted a category C right to drive prior to that, but it is not known in what year.

Improvement suggestions and safety recommendations by the investigation team: Instruction for drivers in the transport of unusual loads.

2007, head-on collision

Car driver and passenger dead, vehicle combination driver injured.

At the time of the accident it was light and warm.

The vehicle combination drifted slightly into oncoming traffic, and the trailer collided with a car coming the other way. As the combination driver braked and steered towards the right, the trailer overturned and the tractor drifted onto the hard shoulder.

The combination driver was over the speed limit and was driving too fast for the circumstances. The combination had been loaded incorrectly.

The 25-year-old driver of the vehicle combination had little experience driving the type of vehicle in question. The induction training provided by the transport company was inadequate. Both the company and the driver had an indifferent attitude.

The driver had been granted a C category right to drive in 2000 and a CE category right to drive in 2003. The driver had driven about 2,000 km in the accident vehicle and had a total of about 800,000 drive-kilometres in motor vehicles and current annual drive-kilometres of about 100,000.

The vehicle combination driver was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Heavy traffic supervision, transport company supervision, vehicle-specific speed limit must not be exceeded, speed limiter set to 80 km/h, professional competence of heavy vehicle drivers, rejuvenating the car stock, cars with better crash resistance, professional driver training.

2008, rear-end collision

Driver of one lorry dead, driver of other lorry slightly injured.

It was a light time of day, and the temperature was almost 10 degrees. The weather was partly cloudy, and the road surface was dry.

A lorry collided with the rear end of another lorry on a secondary road. The lorry in front had changed lanes and activated the turn indicator in preparation for turning left at an intersection.

The driver of the lorry behind was preoccupied with using a mobile phone and satnav device and did not notice the turning lorry in time, colliding with its rear end without braking.

The 24-year-old driver of the rear-ending lorry had had a lorry driving licence for about 1.5 years. There is no information on the driver’s driving experience.

Improvement suggestions and safety recommendations by the investigation team: Advising drivers of the danger of operating mobile phones and other devices while driving; supervision of the use of such devices in road traffic.

2008, head-on collision

Car driver dead, vehicle combination driver uninjured.

At the time of the accident it was dark. There was a strong wind, the road surface was icy, and the temperature was just below zero.

A vehicle combination and a car collided on a main road. The driver of the combination lost control of the vehicle. The vehicle combination drifted sharply into oncoming traffic.

The driver of the combination was over the speed limit and was driving too fast in view of the circumstances. The driver took erroneous action in correcting slippage. The wind acted with force on the large side area of the empty trailer.

The 24-year-old driver of the vehicle combination had had a category CE driving licence for about four years and currently had about 40,000 annual drive-kilometres and had driven about 40,000 km in the accident vehicle. In all, the driver had about 300,000 km of experience in driving motor vehicles.

Improvement suggestions and safety recommendations by the investigation team: Road with median barrier, sufficient road maintenance.

2009, rear-end collision

Car driver dead, vehicle combination driver uninjured.

The accident occurred in daylight. The temperature was almost 20 degrees, and the road surface was dry.

A vehicle combination rear-ended a car on a main road. The car had changed lanes and activated the turn indicator, preparing to turn left. The driver of the vehicle combination failed to notice the halted car in time and collided with its rear end.

The driver of the vehicle combination was in a lowered state of alertness, having been working all night. The driver had set the cruise control; the speed limiter was set to 83 km/h.

The 24-year-old driver of the vehicle combination had been granted a CE category right to drive in 2005. There is no information on the driver's driving experience.

The vehicle combination driver was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Ensuring driver alertness, collision radar and active braking system for vehicles, safe intersection configurations, care in using cruise control, observing speed limits, driver training and advice, seat belt use (car).

2009, intersection collision

Motorcycle driver dead, lorry driver uninjured.

The accident occurred in daylight, in cloudy weather. The road surface was clean and dry, and the temperature was a couple of degrees above zero.

A lorry and a motorcycle collided in an intersection in an urban area. The lorry driver started to cross a main road, having estimated that an approaching vehicle (the motorcycle) was far enough.

The motorcycle driver was slightly over the speed limit and could not brake fast enough to avoid the collision.

The 23-year-old driver of the lorry had had a category C right to drive for about five years. and had driven about 15,000 km in the accident vehicle before the accident. The driver had about 30,000 annual drive-kilometres and a total of about 200,000 km driving experience in motor vehicles.

Improvement suggestions and safety recommendations by the investigation team: Improving visibility at intersections, complying with speed limits, safe waste collection arrangements, developing high-visibility features for waste collection lorries.

2010, head-on collision

Driver of one vehicle combination dead, driver and passenger of other vehicle combination uninjured. Car driver slightly injured.

At the time of the accident it was dark. There was billowing dry snow on the road, over a thin layer of ice. The temperature was below zero.

Two truck-trailer combinations collided on a main road.

The driver of one vehicle combination slowed down and swerved to avoid pedestrians on the side of the road. As a result, the trailer began to weave and collided with an oncoming vehicle combination. The car following the oncoming vehicle combination collided with load that fell onto the road from the weaving trailer.

The driver of the combination that swerved out of control was driving too fast in view of the road conditions. The driver was very inexperienced in operating a heavy vehicle combination. The instructor who was a passenger in the vehicle did not address the issue of excess speed in time.

The slippery road complicated the controlling of the already unstable vehicle combination. The dark clothes of the pedestrians and the low beam headlights made it difficult to see the pedestrians in time.

The 24-year-old driver of the vehicle combination had had a category CE driving licence for about three months and was driving the vehicle in question for the first time, for only 100 km before the accident occurred. The driver had about 35,000 annual drive-kilometres in motor vehicles and about 150,000 km total driving experience in motor vehicles.

The driver of the vehicle combination that swerved was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Night-vision system, 80 km/h maximum speed for vehicle combinations, use of safety equipment, reflectors and light-coloured clothes for pedestrians after dark, vehicle dynamics control systems, sufficient lighting, road with median barrier, wide shoulder, anti-slip measures in road maintenance, driving speeds appropriate for circumstances.

2010, intersection collision (turning in front)

Motorcycle driver dead, lorry driver uninjured.

The accident occurred in broad daylight in dry and warm weather.

The driver of a vehicle combination turned left off a secondary road in front of an oncoming motorcycle. The motorcycle collided with the left front corner of the vehicle combination.

The driver of the combination did not notice the approaching motorcycle in time. The driver of the combination had been working a shift for about five hours. The motorcycle driver was slightly over the speed limit.

The 22-year-old driver of the vehicle combination had the right to drive in the relevant category for about two years and had driven about 5,000 km in the accident vehicle before the accident. The driver's total driving experience was about 15,000 km.

The vehicle combination driver was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Anti-collision radar for vehicles, high-visibility features for motorcycles and motorcycle drivers, complying with speed limits (motorcycle), front number plate for motorcycles (enabling automatic monitoring), ABS brakes for all motorcycles.

2010, rear-end collision

Two car passengers dead, driver slightly injured. Vehicle combination driver uninjured.

The accident occurred in broad daylight in dry and warm weather in summer.

A car on a main road had changed lanes, stopped and activated the turn indicator, preparing to turn left. A vehicle combination collided with the car's rear end. The driver of the vehicle combination did not notice the stopped car in time and made an unsuccessful attempt to swing to the right past the car.

The 23-year-old driver of the vehicle combination had relatively little experience in driving that type of vehicle. Immediately prior to the collision, the attention of the driver of the vehicle combination was probably focused on the driver of an oncoming vehicle combination.

The driver had had the right to drive a vehicle combination for about one year. The driver had driven about 10,000 km in the accident vehicle and had about 20,000 annual drive-kilometres. The driver's total driving experience in motor vehicles was about 150,000 km.

Improvement suggestions and safety recommendations by the investigation team: A separate lane at intersections for turning vehicles, sufficient room at intersections for passing vehicles, road with median barrier, speed limits at intersections, grade intersections, dual carriageway.

2011, other accident (individual accident)

Driver of vehicle combination dead.

The accident occurred at a dimly lit time of day. It was raining, and the temperature was close to zero.

The driver of a vehicle combination on a main road lost control of the vehicle when attempting to remove ice from the windshield wipers by reaching through an open window. The trailer of the combination drifted onto the shoulder and swayed violently. The driver fell out of the cab.

The driver was not concentrating on driving.

The 22-year-old driver of the vehicle combination had been granted a category CE right to drive in 2007 and had driven about 40,000 kilometres in the accident vehicle before the accident. The driver had about 60,000 annual drive-kilometres and about 150,000 km total driving experience in motor vehicles.

Improvement suggestions and safety recommendations by the investigation team: Improving driver training, identifying and emphasising risk factors in training, driver should concentrate on driving, heated blades for windshield wipers.

2011, intersection collision

Lorry driver dead, vehicle combination driver uninjured.

At the time of the accident, it was dark and partly cloudy; the street surface had icy ridges and was slippery with frost. The temperature was well below zero.

A lorry collided with the side of a vehicle combination in an intersection with traffic lights in an urban area. The vehicle combination driver ran a red light and caused the lorry, which had a green light, to run into the vehicle combination.

The 23-year-old driver of the vehicle combination had been granted a CE category right to drive in 2008. The driver had a total of about 100,000 drive-kilometres in motor vehicles and about 50,000 annual drive-kilometres and had driven about 50,000 kilometres in the accident vehicle before the accident.

The vehicle combination driver was wearing a seat belt. The lorry driver was not wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Wearing a seat belt in lorries (stressing its importance even at urban-area speeds).

2012, rear-end collision

Car driver and passenger dead, vehicle combination drivers uninjured.

On the day of the accident, the weather was warm and sunny. The road surface was dry.

A vehicle combination on a secondary road rear-ended another vehicle combination that was making a left turn and then collided with an oncoming car. The driver of the rear-ending vehicle combination did not see the situation ahead in time.

The brakes on the tractor in the combination had already found to be weak but had not yet been fixed.

The 20-year-old driver of the vehicle combination had received a category CE licence five months earlier. There is no information on the driver's driving experience.

The vehicle combination driver was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Intersection safety, roadside checks of heavy vehicles.

2013, rear-end collision

Motorcycle driver dead, lorry driver uninjured.

At the time of the accident, the weather was partly cloudy and it was daylight. The temperature was +14 degrees. The road surface was dry.

The motorcycle collided with the rear end of a lorry that was turning to the left on a road. At the moment of impact, the front of the lorry had crossed the centre line. The motorcycle driver probably had no time to brake or slow down.

The rear lights and turn indicator of the lorry were not visible to drivers behind it because of a structural barrier (underride protection and suction hose).

The motorcycle driver was fatigued, having been working the previous night.

The 20-year-old driver of the lorry had little driving experience in a lorry (2 months). The driver had been granted a category C right to drive in the same year. The driver had about 30,000 km in total driving experience in motor vehicles, and about 15,000 current annual drive-kilometres and had driven about 2,000 km in the accident vehicle and other similar vehicles.

The lorry driver was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Graded intersections, slip lanes for intersections, emergency brakes and airbags for motorcycles, rear cameras for vehicles to show traffic behind, sufficiently large rearview mirrors for lorries that adjust automatically to the driver's position, turn indicators at the top of the vehicle structure, driver training to include focus on the importance of inspecting visibility of lights before starting out, improving the crash safety of lorries (e.g. external airbags and flexible underride protection).

2013, intersection collision

Motorcycle driver dead, lorry driver uninjured.

On the day of the accident, the weather was warm and partly cloudy. The road surface was clean and dry.

A lorry and a motorcycle collided at an access road intersection. The lorry had changed lanes to turn left and started its turn directly in front of a motorcycle that was proceeding in the opposite direction.

The lorry driver did not notice the oncoming motorcycle early enough. Motorcycle skid marks about 13 m long were found on the road. The motorcycle collided with the lorry's front tyre and underride protection.

The lorry was carrying hazardous materials. The lorry driver did not observe the special care and diligence required in the transport of hazardous materials. The driver also did not fully comply with the social security legislation regarding road traffic.

The motorcycle driver was a relatively experienced driver of two-wheeled vehicles.

The 19-year-old lorry driver was relatively inexperienced as a professional driver. The driver had had a category C right to drive for about 1.5 years and also had the professional qualification required by law.

The lorry driver had about 300,000 km total driving experience in motor vehicles and about 50,000 current annual drive-kilometres and had driven about 3,000 km in the accident vehicle. The lorry driver had driven about 12,000 km in all in the accident vehicle type.

The lorry driver was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: More and improved training for drivers transporting hazardous materials, traffic lights or a roundabout for the intersection, installation height of road signs, emphasising the importance of proactive driving in driver training, introducing a camera or collision alert system in vehicles, motorcycle driver training (e.g. anticipation, emergency evasive action and effective braking), colourful driving gear and reflective vests for motorcycle drivers.

2013, rear-end collision

Car driver dead, vehicle combination driver uninjured.

At the time of the accident, the weather was clear and the temperature was +10 degrees. The road surface was dry.

A vehicle combination collided with an oncoming car on a straight stretch on a secondary road.

The driver of the vehicle combination did not notice that the line of vehicles in front (a camper van, a car and another vehicle combination) slowed down and stopped until about three seconds before the collision. The driver of the vehicle combination braked violently, lost control of the vehicle and collided with an oncoming car. The car driver managed to take evasive action towards the right, but not enough to avoid the collision.

The vehicle combination tractor’s anti-lock brakes did not work (several malfunction alerts in the ABS unit).

The driver of the vehicle combination did not maintain a safe distance from traffic in front and did not pay enough attention to other traffic while driving. The driver of the vehicle combination in front had alerted the driver by radio of an obstacle coming up.

The 21-year-old driver of the vehicle combination had about 200,000 km in total driving experience in motor vehicles, and currently had about 100,000 km in annual drive-kilometres and a similar amount of experience in the accident vehicle. The investigation team concluded that the driver had little driving experience. It is not known how long the driver had had a category CE right to drive.

The tachograph disc from the vehicle combination is missing the date entries for the day in question. This makes it possible to falsify the tachograph disc data after the fact.

The driver of the vehicle combination was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Training in proactive driving for heavy vehicle drivers, also for foreign drivers, emphasising the importance of concentrating on driving in professional driver training, developing an anti-

rear-ending technology for vehicles, driving prevention systems for vehicles whose anti-lock brakes are inoperative (legislative requirement to repair the problem before driving the vehicle).

2013, rear-end collision

Tractor driver dead, vehicle combination driver uninjured.

On the day of the accident, the weather was bright and sunny. The road surface was clean and dry.

A vehicle combination rear-ended a tractor in an 80 km/h speed limit zone on a main road. Vehicles ahead of the vehicle combination overtook the tractor, which was driving more slowly along the shoulder of the road. The vehicle combination driver noticed the tractor too late. Despite attempted evasive action to the left, the front of the vehicle combination collided with the tractor's excavator scoop and rear wheel. The tractor ran off the road into a ditch on the right, and the vehicle combination tipped over on its side.

The driver of the vehicle combination was probably distracted by something else besides driving, and was also over the speed limit and driving too fast in view of the circumstances.

The 25-year-old driver of the vehicle combination had been granted a CE category right to drive in 2008. There is no information on the driver's driving experience. The driver was, however, a professional driver.

The vehicle combination driver was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Compulsory seat belts in tractors, improved markings for tractors (e.g. illuminated 'slow vehicle' sign), improved seats in tractors for crash resistance, recording video cameras in vehicles, obstacle alert system and emergency braking system in vehicles.

4.4.2. Pedestrian/cyclist accidents

2006, intersection collision (crosswalk)

Cyclist dead, vehicle combination driver uninjured.

At the time of the accident, it was daylight and the weather was partly cloudy and warm. The road surface was clean and wet.

A cyclist was run over on a crosswalk by a vehicle combination turning into the street at an intersection. The driver of the vehicle combination did not notice the cyclist to one side in time. Both the cyclist and the driver of the vehicle combination had a green light.

The cyclist may have been caught in a blind spot of the rearview mirrors of the vehicle combination. Also, the driver may have been focused on the pedestrian crossing the crosswalk from the opposite direction.

The 21-year-old driver of the vehicle combination had been granted a CE category right to drive in 2004. The driver had driven about 3,000 km in the accident vehicle and had about

100,000 annual drive-kilometres. The driver had a total of about 400,000 drive-kilometres in motor vehicles.

Improvement suggestions and safety recommendations by the investigation team: Paying attention to blind spots in heavy vehicles, driver diligence in traffic, speed bumps for pedestrian/cyclist.

2006, intersection collision (crosswalk)

Cyclist dead, lorry driver uninjured.

The accident occurred in daylight, in sunny and warm weather. The road surface was dry.

The cyclist was run over on a crosswalk at an intersection by a turning lorry. The cyclist was crossing the crosswalk on a green light. The lorry driver also had a green light.

Apparently the lorry driver did not notice the cyclist at all.

The 20-year-old lorry driver had been granted a category C driving licence in 2004. There is no information on the driver's driving experience.

Improvement suggestions and safety recommendations by the investigation team: Advice for cyclists about cycling rules, advice for motor vehicle drivers about taking pedestrian/cyclist into account at intersections.

2008, other accident

Pedestrian died, bus/coach driver uninjured.

The accident occurred in sleet, in the dark. The temperature around freezing, and the road was slippery.

The bus/coach driver did not notice a pedestrian who had fallen down in the road in time. The driver was distracted by another pedestrian, who attempted to warn the driver by waving about the pedestrian who had fallen down.

The pedestrian who fell down did not have a reflector and was under the influence of alcohol.

The 23-year-old driver of the bus/coach had been granted a category D1 right to drive in 2007 and had driven about 70,000 kilometres in the accident vehicle before the accident. The driver had about 80,000 annual drive-kilometres and a total of about 200,000 kilometres of driving experience in motor vehicles.

The bus/coach driver was wearing a seat belt.

Improvement suggestions and safety recommendations by the investigation team: Use of reflectors by pedestrians, traffic education, driver's attention focused on the direction of driving.

2011, intersection collision

Cyclist dead, lorry driver uninjured.

At the time of the accident, the weather was warm, dry and partly cloudy.

A cyclist walking a bike was run over by a turning lorry at a street intersection. The lorry driver was talking on a mobile phone at the time (without a hands-free device) and was distracted.

The lorry driver was 24 years old and had been granted a C category right to drive in 2006. The driver had driven about 100,000 km in the accident vehicle. The driver had about 55,000 annual drive-kilometres and about 900,000 km total driving experience in motor vehicles.

Improvement suggestions and safety recommendations by the investigation team: Drivers to use a hands-free device when on the phone while driving, cyclists to wear a helmet.

2011, crosswalk accident

Pedestrian died, lorry driver uninjured.

The accident occurred in partly cloudy weather, the temperature was +4 degrees. The accident occurred at a dimly lit time of day. The street lights were on.

A lorry collided with a pedestrian on a crosswalk beyond an intersection in an urban area. The lorry driver did not notice the pedestrian in time.

The pedestrian wore dark clothes and did not have a reflector.

The lorry driver did not comply with rest period regulations and was in a hurry to pick up the last load of the shift. The lorry driver was careless about safe driving and was smoking at the time of the accident.

The 23-year-old driver had been granted the right to drive a lorry in 2006 and had driven about 120,000 kilometres in the accident vehicle before the accident. and had about 60,000 annual drive-kilometres. The driver had about 160,000 km of driving experience in motor vehicles.

Improvement suggestions and safety recommendations by the investigation team: Drivers to regulate their driving speed according to circumstances, pedestrians to wear reflectors, renewal of heavy vehicle stock (with regard e.g. to crash safety), sufficient road lighting, sufficient visibility.

2012, intersection collision (crosswalk)

Pedestrian died, bus/coach driver uninjured.

The accident occurred at a dimly lit time of day. The weather was partly cloudy. The road surface was clean and dry. The temperature was +5 degrees.

A pedestrian was run over by a turning bus/coach on a crosswalk at an intersection. Both parties had a green light.

The bus/coach driver did not notice the pedestrian start to cross the crosswalk from the right. The rearview mirrors of the bus/coach did not provide enough coverage. The young pedestrian

behaved erratically. According to an eye witness, the pedestrian ran suddenly onto the crosswalk.

The 20-year-old bus/coach driver had received a category D driving licence in 2010. There is no information on the driver’s driving experience.

Improvement suggestions and safety recommendations by the investigation team: Improving traffic lights (no simultaneous green lights for vehicles and pedestrian/cyclist), anti-collision radar with automatic braking for vehicles, mirror placement and rearview cameras on buses/coaches, reducing crash aggressiveness of vehicles in pedestrian accidents (underride protection, soft structures, impact prevention), separating vehicles and pedestrian/cyclist (e.g. underpasses), channelling crosswalks and moving them further from intersections, traffic education at school, children to wear day-glo vests in traffic.

5. ROAD ACCIDENT DAMAGE CAUSED BY YOUNG HEAVY VEHICLE DRIVERS

The Finnish Motor Insurers' Centre compiles a database of claims for road accident damage paid out of motor liability insurance. The data in this database are derived from damage claims submitted by clients of insurance companies. The insurance companies append details of their own to the damage claims and then send the data to the Motor Insurers' Centre.

Road accident damage for which compensation was paid out of motor liability insurance can be analysed by driver involvement and divided into accidents involving property damage on the one hand and personal injury on the other.

The road accident damage database includes cases of property damage and personal injury where the driver's year of birth and age are not known. This is because the damage claims data are not updated with the driver's age after the fact. Because of the missing age data, a statistical analysis of young lorry and bus/coach drivers in cases of property damage and personal injury for which compensation was paid out of motor liability insurance would not be feasible.[63]

However, the following is an indicative analysis of the **percentage** of property damage and personal injury **caused** by lorry and bus/coach drivers aged 18–25 out of the property damage and personal injury caused by all lorry and bus/coach drivers between 2009 and 2013, assuming the percentage of missing age data for drivers who were the participant causing the accident of the accident to be the same in all driver age groups.[64]

Professional and non-professional drivers cannot be differentiated in the insurance company data with the same accuracy as in the road accident investigation team material. The closest we can come to identifying professional heavy vehicle drivers is to select lorry and bus/coach drivers. Only those cases were extracted from the damage database where the vehicle category of the vehicle involved entered in the Vehicular and Driver Register (ATJ) was M2, M2G, M3, M3G, N2, N2G, N3 or N3G.[65] That the vehicle was in commercial use was ensured by selecting only those vehicles that on registration were indicated as "subject to permit" (type of vehicle use registered by the insurance company or Trafi).[66]

The finding was that the percentage of property damage caused by lorry and bus/coach drivers aged 18–25 out of the property damage caused by all lorry and bus/coach drivers decreased by about two percentage points between 2009 and 2012. By contrast, the percentage of personal injuries caused by young drivers out of the personal injuries caused by all drivers remained stable. (Figure 4 on the following page.)

The annual number of accidents involving property damage caused by heavy vehicle drivers between 2009 and 2013 varied between 5,400 and 6,600; the annual number of accidents causing personal injury varied between 700 and 950.

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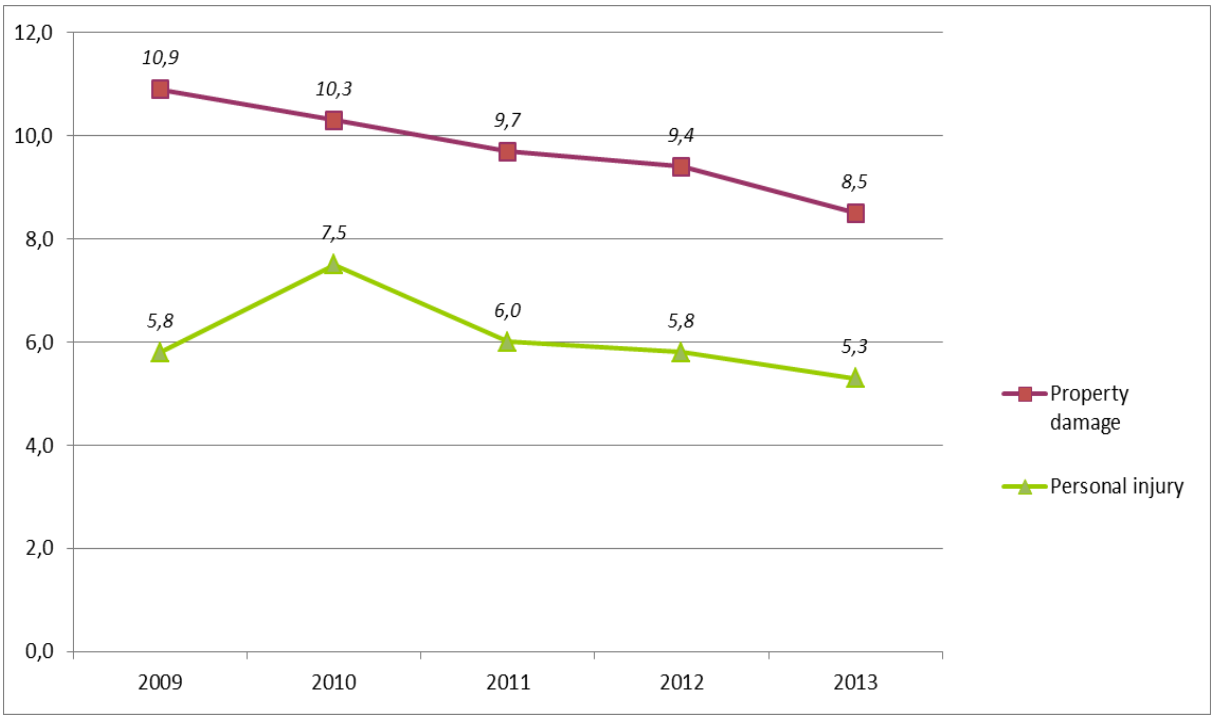
63 Sihvola, N. 2014. E-mails from Niina Sihvolalta on 30 Oct 2014, 4 Nov 2014 and 22 Dec 2014. Finnish Motor Insurers' Centre, Traffic Safety Committee of Insurance Companies (VALT).

64 Prior to 2009, vehicle data from the Vehicular and Driver Register could not be combined with the road accident material.

65 Buses/coaches and lorries. See Finlex: Vehicle Act (1090/2002), chapter 2. http://www.finlex.fi/fi/laki/ajantasa/2002/20021090.

66 The options for vehicle use status are: private, **subject to permit,** school vehicle, rented without driver, sales warehouse (storage insurance). http://www.trafi.fi/filebank/a/1322478107/feefb1ef2bc60e01c51eeedb2ea50906/1786-11Ajoneuvonkaytonmuutos.pdf

Figure 4. Percentage (%) of accidents resulting in property damage and personal injury caused by heavy vehicle (lorry and bus/coach) drivers aged 18–25 out of the accidents resulting in property damage and personal injury caused by all heavy vehicle drivers between 2009 and 2012. *Damage and injuries compensated out of motor liability insurance by insurance companies. (Source: VALT/LVK.)*[67]



[67] VALT 2014. *Vakuutusyhtiöiden liikennevakuutuksesta korvatut vahingot 2000–2012*. Liikennevakuutuskeskus, Vakuutusyhtiöiden liikenneturvallisuustoimikunta VALT. [Damage for which compensation was paid out of motor liability insurance of insurance companies 2000–2012. Finnish Motor Insurers' Centre, Traffic Safety Committee of Insurance Companies (VALT).]

6. SUMMARY AND CONCLUSIONS

6.1. Earlier research findings

Finnish studies show that inexperienced professional drivers represent a growing risk in road traffic. Young professional drivers under 25 and professional drivers over 54 caused fatal accidents more often on average than professional drivers in other age groups. However, the knowledge and skill levels of professional drivers are relatively rarely found to be risk factors contributing to an accident, especially compared with non-professional drivers. The main risk factor for young drivers is speeding, while for older drivers it is health.

International studies show that young professional heavy vehicle drivers have an elevated accident risk compared with drivers of other ages up until the age of 27. The accident risk graph is a U curve; the accident risk begins to increase again after the age of 63. These international research findings include studies conducted at the Department of Psychology at the University of Helsinki concerning the involvement of professional heavy vehicle drivers in fatal accidents.

According to a study conducted in New South Wales in Australia, the accident rate for lighter heavy vehicles is elevated until the age of 20 and the accident rate for heavier vehicles (e.g. 'road trains') is clearly elevated until the age of 34. The study covered accidents caused by professional heavy vehicle drivers for a period of ten years. The number of accidents was measured against the number of kilometres driven.

6.2. Involvement of young professional drivers in accidents compared with involvement of all heavy vehicle drivers

In all, the percentage of involvement of young professional drivers in fatal road accidents was very similar to the percentage of involvement of all heavy vehicle drivers in fatal accidents.

Professional drivers aged 18–25 were the participant causing the accident of a fatal accident with a slightly higher incidence than all heavy vehicle drivers. A young professional driver was the participant causing the accident in 27 % of motor vehicle accidents and in 33 % of pedestrian/cyclist accidents. The figures for all heavy vehicle drivers were 22 % and 18 %, respectively.

The accidents in which young professional heavy vehicle drivers and all heavy vehicle drivers were involved were very similar. Most of the accidents were head-on collisions and pedestrian/cyclist accidents.

The percentages of young professional heavy vehicle drivers who had not complied with driving time and rest period provisions prior to the accident were roughly similar to those of all heavy vehicle drivers. However, this information is lacking for nearly one fourth of the young professional drivers, because this variable was not introduced until 2002.

Earlier traffic violations over a period of five years were not examined in the report on all heavy vehicle drivers that was the control for the present analysis.[68] Of the young professional heavy vehicle drivers, 24 % had committed no traffic violations coming to the attention of the police over the previous five years. About one in five had 1 violation and about one in five had 2 violations, while 12 % had at least five violations in the previous five years.

The road-specific speed limit was exceeded by a young professional heavy vehicle driver in 34 % of motor vehicle accidents and 27 % of pedestrian/cyclist accidents. The vehicle-specific

[68] Rajamäki, Luoma & Kallberg 2014.

speed limit was exceeded by at least 1 km/h in half of the motor vehicle accidents and 17% of the pedestrian/cyclist accidents.

Out of all fatal heavy traffic accidents, 46 % of lorry drivers and 21 % of bus/coach drivers exceeded either the road-specific or the vehicle-specific speed limit or both prior to the accident.

Of the immediate risk factors leading to a fatal accident, "participant could not avoid the accident" is by far the most common immediate risk factor among both young professional heavy vehicle drivers and all heavy vehicle drivers: 57 % for young professional drivers, 68 % for all lorry drivers and 53 % for bus/coach drivers.

Vehicle handling errors are slightly more common as an immediate risk factor among young drivers than among all drivers. By contrast, the percentages for participant's observational error, anticipation error or error of judgment and altered functional capacity (e.g. seizure, loss of consciousness, falling asleep or diminished alertness) are lower for young drivers than for all drivers.

6.3. Accidents caused by young professional drivers vs. accidents caused by novice drivers

Section 4.4. describes all fatal motor vehicle accidents and pedestrian/cyclist accidents between 2006 and 2013 where the participant causing the accident ("A participant") was a professional heavy vehicle driver aged 18–25. In cases where the accident investigation team found in its report that the driver's inexperience and/or young age were a background factor contributing to the accident, this is indicated in the report.

It is noteworthy that **driver inexperience** or slight driving experience as a professional driver or in the vehicle in question was named as a background risk factor in 9 motor vehicle accident investigation reports (out of 19). In some cases, the driver being **inadequately instructed** in the handling of the vehicle or the load or in the performing of the task was named as a background risk factor.

What is essential in analysing these accidents is not the driver's young age as such but the driver's inexperience. Often an inexperienced driver is also a young driver, but a person who began to work as a professional driver at an older age may also be an inexperienced driver.

While it would be possible to analyse the road accident investigation board material to select inexperienced professional drivers, this would be a manual effort requiring much more work than selecting young professional drivers. The selection should be made by reviewing the hard-copy investigation files by hand instead of examining electronic material.

Before beginning the work, it should be clearly defined what is meant by "inexperienced driver". This may be influenced by the time since being granted the right to drive in a heavy vehicle category, the time[69] and drive-kilometres in the type of vehicle in question, and drive-kilometres in other vehicles in road traffic.

A young professional driver who began driving a moped at age 15 and moved on to heavy vehicles immediately on reaching the required age has a much longer "traffic career" and experience in traffic than a driver who, for instance, never drove a moped, received a car driving licence at the age of 23 and received a lorry driving licence after that.

[69] The dates on which the right to drive in each category was granted can be obtained from the driving licence application of the Vehicular and Driver Register.

Indeed, the key conclusion of the present analysis is that **instead of examining young and novice professional drivers, we should look at inexperienced professional drivers and the accidents caused by them.** Inexperience is a very individual and variable thing. However, on the basis of the background and interviews included in the road accident investigation teams' material it would be very difficult to determine with any accuracy for every driver causing or involved in an accident whether that driver was inexperienced or not.

Since 2003, road accident investigation teams have also been investigating non-fatal heavy traffic accidents, i.e. heavy traffic accidents involving personal injury or major property damage, as part of the RX project.[70] Also, more and more data are being gained on accidents leading to serious injuries, because some of these too are being investigated by road accident investigation teams. These accidents could also be included in analyses of accidents caused by inexperienced drivers.

6.4. Deliberately caused accidents

In both young professional drivers' fatal accidents and all heavy vehicle drivers' fatal accidents, the most common immediate risk factor by far was that *the participant could not avoid the accident*. In many cases, the other party – usually the driver of a car or motorcycle – deliberately caused the accident with suicidal intent.

Several parties are currently preparing to undertake a joint study on suicides in road traffic.[71] Young and inexperienced heavy vehicle drivers should be given particular attention in that study, because for them in particular being involved in such an accident may be a highly traumatic experience, and recovery and returning to work may be challenging.

Suicides, whether in road traffic or otherwise, should always be reported **as neutrally as possible,** following the guidelines published by the World Health Organization in 2008.[72] Organisations for the prevention of suicides have also published guidelines on how the media should report suicides, etc.[73]

The aforementioned guidelines state that when reporting suicides, one should *inter alia*:

- avoid language and headlines sensationalising the suicide or presenting suicide as a normal thing to do or as a solution to problems;
- avoid reporting the location and method of the suicide or attempted suicide;
- inform readers or viewers where they can find help or advice as needed (e.g. a crisis helpline phone number);
- report that suicide attempts are a public health problem often associated with mental health issues and/or intoxicant addiction;

[70] Extract from the road accident investigation operating plan for 2014: "Accidents involving heavy vehicles and resulting in personal injury or major property damage (RX) should be investigated nationwide, 2 or 3 per investigation team. These should be selected on a case-by-case basis and should include accidents involving truck-trailer combinations, buses/coaches, lorries without trailers and trailer separations. Priority should be given to head-on collisions, running off road accidents and intersection collisions on main roads that resulted in or could have resulted in personal injury."

[71] E.g. the National Institute for Health and Welfare (THL), the police, Valvira, the Finnish Motor Insurers' Centre, the Hospital District of Helsinki and Uusimaa, the University of Helsinki and Trafi.

[72] WHO 2008. *Preventing Suicide. A Resource for Media Professionals*. Department of Mental Health and Substance Abuse. World Health Organization 2008. http://www.who.int/mental_health/prevention/suicide/resource_media.pdf.

[73] American Foundation for Suicide Prevention, http://www.afsp.org/news-events/for-the-media/reporting-on-suicide and *Recommendations for Reporting on Suicide*, http://www.afsp.org/content/download/1066/16814/file/recommendations.pdf.

- exercise particular care and diligence in reporting suicides of public figures.

6.5. Link to the responsibility model for road transport companies

In some of the accidents caused by young professional heavy vehicle drivers, an obvious background risk factor was that the driver had had inadequate instruction in handling the vehicle or the load or for the job at hand. In some accidents, the driver causing the accident or involved as the collision partner had not complied with the driving time and rest period legislation.

These cases in particular are closely linked to the responsibility and safety culture of the transport company in question. Transport companies play a vital role in preventing similar accidents and thereby in promoting road safety.

Trafi is currently developing a management and procedure model for road transport companies to adopt voluntarily. The purpose of the model is to improve the safety culture of commercial traffic and environmentally sustainable practices.

The model includes the following elements:

- management commitment, clear responsibilities for safety and environmental issues;
- risk management;
- defining safety and environmental goals;
- systematic information gathering and analysis, reporting on hazards;
- competence management, using electronic driving data in training, and training for maintaining professional competence;
- vehicle stock compliance with regulations, monitoring and maintenance of vehicles, pre-departure checks.

Further information on the model is available on the Trafi website (in Finnish): http://www.trafi.fi/tieliikenne/ammattiliikenne/vastuullisuusmalli.[74]

6.6. Proposal for a further study

Based on the present analysis, we hereby propose that accident data from Finland, Sweden and Norway be used to conduct a **Nordic analysis of the involvement of inexperienced professional heavy vehicle drivers in accidents,** compared with the involvement of more experienced professional drivers. Combining data from three countries would ensure sufficient data for drawing reliable conclusions. Danish data could also be included.

However, conducting a Nordic analysis requires that accident investigation databases in all countries contain sufficient data to enable determination of whether a professional driver involved in an accident is inexperienced or not.

A workshop is being held in Oslo in March 2015 at the initiative of Norway to explore the potential of combining accident investigation databases from various countries for purposes of analysis and research. Sweden and Norway have previously conducted a joint study on the impact of ESP electronic stability control and studded winter tyres on accidents.

[74] Trafi. *Tieliikenteen kuljetusyritysten vastuullisuusmalli*. [Responsibility model for road transport companies.] http://www.trafi.fi/tieliikenne/ammattiliikenne/vastuullisuusmalli.

Participants are coming to the workshop from Sweden, Denmark and Finland in addition to Norway, and possibly from Iceland. This workshop would be an excellent forum for discussing the idea of studying accidents involving inexperienced professional drivers. A joint study involving several countries might also carry weight in the talks concerning the potential revision of the Professional Driver Directive in Brussels.

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