



Vocational Education and Training Means to approach the Shortage of Professional Drivers in Europe

Deliverable:	09	Version:	2.2
WP:	02	Last update:	27/12/2011
Prepared by:	Claudia Ball, DEKRA Akademie GmbH, DE		

With contributions from national
research and analysis provided by:

- Tanja Bacher & Simone Kunz, 3s research laboratory (AT)
- Peter Klingler, DEKRA Albasafe Akademie Kft. (HU)
- Claudia Ball, Tanja Buchsdrücker, Benedikt Schimmelpfennig & Malte Stamer, DEKRA Akademie GmbH (DE)
- Joanna Burchert & Nils Petermann, ITB (DE)
- James Tillyer, FTA (UK)
- Caterina Boschi, TkFormazione (IT)
- Hans Konings & John van Rijn, VTL (NL)
- Pablo Vidal, ASIMAG (ES)
- Linda Gauthier, CTHRC (CA)

For further information on the project please consult: www.project-profdrv.eu

For further information on the paper please contact: Claudia.Ball@dekra.com or EU-project.akademie@dekra.com

Short summary:

During the past decades qualification requirements changed and increased fundamentally for professional drivers because of changes in work organisation, new technical standards, changing legal regulations, market requirements and work environments as well as a fast internationalization of the transport market. These developments contradict with the rather low level of professional qualification and a missing "learning" culture in the branch that characterises this occupation nearly all over Europe and leads, together with a mostly negative image of the sector, already today to an alarming shortage of qualified drivers who possess the qualifications required by employers. It is therefore this papers aim to further elaborate what can be done from the side of vocational education and training in order to overcoming this issue that challenges the European transport industry and is even expected to increase in future.

This paper therefore reviews studies that have been implemented in different national contexts within Europe and abroad as well as at a European level in order to characterise the driver shortage (chapter 2) and to collect and systemise causes and solutions identified and proposed by the different studies and reports (chapter 3). The VET related suggestions to address the driver shortage are discussed in more detail with a special emphasis on their possible application in a European context based on additional research and stakeholder consultations conducted by the ProfDRV partners in Austria, Italy, Germany, Hungary, the Netherlands, Spain and the UK (chapter 4). Since the qualification of professional drivers is already since many years discussed and addressed at a European policy level, the paper also discusses current European policy approaches (directive 2003/59/EC, EQF and ECVET) and their possible contribution to overcoming the professional driver shortage (chapter 5).

Table of content

	<i>page</i>
(1) Vocational education and training means to address the driver shortage	4
(2) Characterising the shortage of professional drivers	4
(2.1) The European situation	5
(2.2) Other parts of the world	7
(3) Causes and strategies	8
(3.1) Causes of the professional driver shortage	8
(3.2) Strategies proposed to approach the shortage of professional drivers	11
(3.3) The role of vocational education and training	13
(4) Vocational education and training means to approach the shortage of professional drivers	14
(4.1) Vocational education and training based on labour market/ industry needs	14
(4.2) Career paths as a way to make professional driving attractive to youth and to keep experienced drivers in the branch	16
(4.3) Employer support in human resource management (recruitment, retention, etc.) with regard to professional drivers and management of labour turnover	21
(4.4) Addressing health and safety topics within professional drivers vocational education and training	21
(4.5) Further activities implemented in the ProfDRV partner countries to address the driver shortage	22
(5) European instruments and their role to approach the shortage of professional drivers	23
(5.1) Professional driver initial and periodic training based on directive 2003/59/EC	23
(5.2) The European qualifications framework for lifelong learning (EQF) and the European credit system for vocational education and training (ECVET)	24
(6) Conclusions and recommendations	25
List of references	26

(1) Vocational education and training means to address the driver shortage

During the past decades qualification requirements changed and increased fundamentally for professional drivers because of changes in work organisation, new technical standards, changing legal regulations, market requirements and work environments as well as a fast internationalization of the transport market. These developments contradict with the rather low level of professional qualification and a missing "learning" culture in the branch that characterises this occupation nearly all over Europe and leads, together with a mostly negative image of the sector, already today to an alarming shortage of qualified drivers who possess the qualifications required by employers. It is therefore this papers aim to further elaborate what can be done from the side of vocational education and training in order to overcoming this issue that challenges the European transport industry and is even expected to increase in future.

This paper therefore reviews studies that have been implemented in different national contexts within Europe and abroad as well as at a European level in order to characterise the driver shortage (chapter 2) and to collect and systemise causes and solutions identified and proposed by the different studies and reports (chapter 3). The VET related suggestions to address the driver shortage are discussed in more detail with a special emphasis on their possible application in a European context based on additional research and stakeholder consultations conducted by the ProfDRV partners in Austria, Italy, Germany, Hungary, the Netherlands and the UK (chapter 4). Since the qualification of professional drivers is already since many years discussed and addressed at a European policy level, the paper also discusses current European policy approaches (directive 2003/59/EC, EQF and ECVET) and their possible contribution to overcoming the professional driver shortage (chapter 5).

In this regard it may nevertheless not be forgotten that VET and therefore also the aspects discussed in this paper can only be a part of the necessary considerations and approaches to address this shortage issue. Other aspects such as poor working conditions, low wage levels and the generally bad image of the occupation play a crucial and (partially) even more prominent role in this context, but are not addressed by this paper. It therefore needs to be kept in mind that the proposed VET means and measures can only be parts of a wider strategy to overcome the professional driver shortage in Europe.

(2) Characterising the shortage of professional drivers

The shortage of professional drivers is an issue not limited to Europe or even a particular country. It can rather be considered a global phenomenon that similarly occurs in Europe, North America (US and Canada), South Africa, Australia, New Zealand and in other parts of the world and that is not just an issue "for mature economies in Western Europe and North America. ... [It exists] wherever there are competitive job markets and relatively low unemployment. But even emerging economies are experiencing a driver shortfall when those countries' most skilled drivers go abroad in search of better salaries." (Mannaerts, 2007, p.1) The manpower 2010 Talent Shortage Survey (Manpower, 2010) ranks drivers in 23 out of the 36 countries worldwide investigated as one of the top 10 jobs employers have difficulties to fill. Although these regions and countries strongly differ from each other in terms of economy, cultural backgrounds, characteristics of the transport sector/market and education systems, similarities are evident when it comes to the characteristics of the shortage of professional drivers in the road freight transport sector.

Different regions and countries investigated the driver shortage from their specific perspective and background and based on this different recommendations/strategies were developed within different timeframes. Although it is not possible to investigate all these efforts in detail in the framework of this research, the situation in Europe and in other parts of the world is roughly described below in order to open up the possibility to learn from each other and to broaden the overall perspective on the professional driver shortage.

(2.1) The European situation

The majority of studies on the driver shortage in Europe have been conducted before or during the economic downturn, but recent publications provide evidence that the economical downturn did not permanently decrease the shortage and that the figures estimated between 2007 and 2009 are still valid for this occupation that is strongly related to economic fluctuation. It is even argued that the downturn might have stronger effects on this occupations than on others and has increased the shortage because drivers lost their jobs, changed into other occupations and do not return to driving. What might also be an effect of the generally low qualification level and the difficult work conditions within professional driving.

A study conducted on behalf of the European Parliament, Directorate General for Structural and Cohesion Policies, estimated the following driver shortage for selected countries in Europe for 2008:

Table 1: Estimated driver shortage in 2008 (Samek Lodovici et al., 2009, p.63)¹

	Estimated number of drivers	Assumed shortage ratios	Estimated driver shortage
EU-27	1 960 000	3.8	74 480
Belgium	44 157	3.6	1 590
Czech Republic	72 360	5	3 618
France	244 269	2	4 885
Germany	216 646	3.3	7 149
Italy	237 585	3.9	9 266
Poland	157 366	5	7 868
Portugal	45 361	4.6	2 087
Romania	53 492	3.2	1 712
Spain	275 160	4.5	12 382
The Netherlands	86 065	4.8	4 131
United Kingdom	208 061	0.7	1 456

As indicated already above drivers rank in 23 out of 36 countries worldwide under the top 10 jobs that are difficult to fill (Manpower, 2010). Table 2 summarises the results from the underlying surveys conducted between 2005 and 2010 and therefore allows a view on the development of this occupation on the labour market. The table shows that in 2008 and 2009 the rank occupied by drivers declined compared to the years before in most cases. But in 2010 drivers take again a higher rank under the jobs that cannot be easily filled. Although these figures are only relative because they have to be seen in relation to other parts of the labour market and to the overall labour market situation, they indicate that the economical downturn slowed down the professional driver shortage in its development and effected the transport sector only for a limited timeframe.

Table 2: Results from Manpower Talent Shortage Survey ranking of vacancies difficult to fill by employers 2006-2010 – vacancies for drivers (based on results by Manpower, 2006, 2007, 2008, 2009, 2010)

	AT	BE	CZ	FR	DE	HU	IT	NE	NO	PL	RO	ES	SE	UK	W
2006	*	2	**	3	8	**	4	*	*	**	**	8	8	5	8
2007	3	3	**	2	7	**	3	3	6	**	**	7	4	*	8
2008	6	2	3	2	2	**	7	3	6	2	6	7	3	10	8
2009	5	6	5	2	8	**	5	6	*	5	8	6	5	*	10
2010	4	6	5	4	4	3	4	3	1	4	4	*	2	4	9

* not among top10; ** not investigated; W worldwide

Samek Lodovici et al. (2009) define five determinants for the shortage of qualified drivers and therefore for the difficulties to fill open driver positions in Europe:

¹ Please note, these figures seem to be strongly underestimated for at least some countries as data collected by EuroTra indicates.

- Socio-economic factors, such as global economic growth together with the EU enlargement that increase the demand of road transport and drivers
- Demographic factors, such as the generally shrinking number of people in working age in Europe and an even worse situation for drivers
- Work attractiveness, that is strongly influenced by factors such as negatively perceived physical work environment and social conditions, the negative image of the occupation, poor career prospects and health and safety related issues
- Qualifications (skills and training), qualification needs changed and increased fundamentally over the past years due to technical innovation, globalisation what leads to a skill shortage
- EU regulations, having an indirect impact due to modifications of labour demand, working conditions and qualification requirements.

In order to further characterise the professional driver shortage in Europe the determinants “demography” and “qualification” need some further specification. The determinant “demography” is not just a determinant but also a characteristic of the driver profession in Europe. The example from Germany illustrates that the demographic challenges of an aging workforce faced in the driver profession follow in general the same structure as the challenges faced by the overall labour market (see figure 1) that challenges many sectors in Europe.

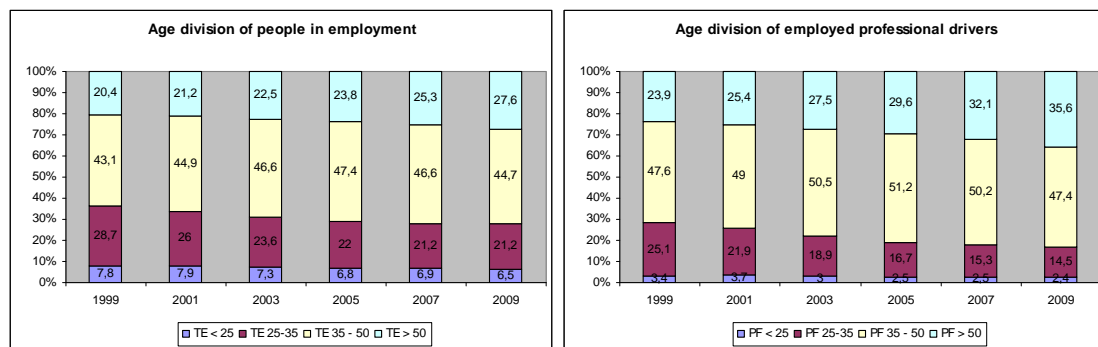


Figure 1: Age division people in employment and employed professional drivers in Germany (data taken from “Berufe im Spiegel der Statistik”, IAB, 2011)

The parameters that specifically characterise the driver occupation are visible when examining the differences between the age group ratios in more detail. Figure 2 shows that the ratio tendency of employed people below 25 (being in general below the average) and between 35 and 50 (being in general above the average) are slowly drawing nearer to the workforce average but are in general stable. But the ratio of employed drivers above 50 is far bigger and stronger increasing than the equivalent ratio of the workforce average. A similar but opposite picture is visible for the age group between 25 and 35. The ratio is below the workforce average and also decreases stronger. Overall this demonstrates that the challenges of an aging workforce for the driver occupation do not only follow the general trend on the labour market, but increases it. Similar results are reported from the United Kingdom, France and other European countries (Skills for Logistics, 2007; Samek Lodovici et al., 2009).

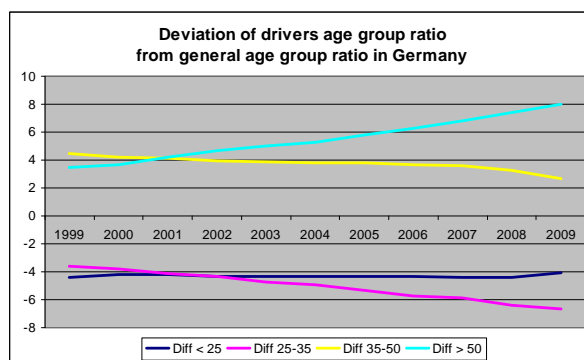


Figure 2: Deviation of driver age group ratio from general age group ratios of employees in Germany (data taken IAB, 2011)

An aspect closely related to this trend within deviations of driver age groups is the job turnover that can be considered being characteristic for the professional driving occupation. Samek Lodovici et al. (2009) point out that the high turnover rate of drivers is especially critical because it deprives important expertise and experience from

the sector and it hinders firms to invest in training. They further indicate that job turnover is especially related to migrant drivers within EU.

Although such numbers seem to indicate a quantitative shortage of professional drivers in terms of a big group that will retire soon and too few young people entering the occupation, research results clearly demonstrate a qualitative shortage of professional drivers possessing the necessary knowledge, skills and competences required by employers (Klee et al, 2008; Menist, 2007; Samek Lodovici et al., 2009; etc.). Klee et al. (2008) compared data about unemployed drivers and open positions for drivers in Germany. They observed that the number of unemployed drivers decreased in their investigation period January 2005 – July 2007 but that five times more drivers are unemployed than vacancies are available. Employer interviews showed that lacking personal qualification (primarily soft skills) of applicants is one of the major (mostly even the major) reason that vacancies were not filled. Other studies confirm and/or predict these results also for other European countries by introducing the perspective of a “qualitative mismatch’ between demand and supply [rather] than a shortage in the ‘number’ of drivers” (Samek Lodovici et al., 2009, p. 91). However, it may not be forgotten that other factors such as low wage levels or poor work conditions also play a crucial role with regard to the driver shortage that is especially reported with regard to the long-haul business and influence these research results.

(2.2) Other parts of the world

Similar characteristics of the driver shortage are also observed in other countries outside Europe.

The report “Driving Australia’s Future: A Report and Action Plan Addressing the Skill Needs of the Road Freight Transport Industry” (Australian Trucking Association, 2003) describes the shortage in *Australia* as follows:

“An Ageing Workforce in a Complex Industry

The road freight transport industry workforce is ageing. Each of the road freight transport occupations has a proportion of 45 to 54-year-olds relatively higher than the proportion for all occupations, while the proportion of 15-24 year olds is low. An estimated 10% of the road freight transport workforce will retire in the next decade. The average age of the Australian truck driver is now 49 years.

Against this background, evidence indicates that the road freight industry has a number of serious problems in recruiting and retaining people with the right skills and in overcoming a shortfall in its skills base. It is also struggling to present itself in a favourable light to the broader community, which is necessary if it is to attract new recruits.

All this is occurring at a time when the industry is becoming more complex. Freight is becoming more complex, trucks have become larger and more technologically sophisticated in order to carry the increasing freight tonnage more efficiently; distances travelled are increasing; the regulatory and safety environments are being strengthened, and just when it needs to do so, the trucking industry is also experiencing difficulties in delivering early, credible and effective training to existing employees and new entrants.” (Australian Trucking Association, 2003, p. 8)

The American Trucking Association and Global Insight, Inc. (2005) describe a similar picture for the *United States*. They also refer to an aging workforce that is characterised by retention and recruitment challenges especially for long-haul heavy-duty truck drivers and they describe the shortage of qualified drivers similarly to the situation in Australia and Europe:

“Numerical estimations of the driver shortage in terms of the size and projected growth of different demographic groups do not tell the whole story. The industry faces a constant challenge of finding qualified drivers. Despite the severe shortage, many firms continue to reject a very high percentage of driver applicants due to their lack of qualifications. And the challenge of finding qualified drivers has grown in recent years, as heightened concerns

with security and safety have resulted in new regulatory requirements for the trucking industry. Nonetheless, driver qualifications and safety remain a dominant concern; the cost of lowering hiring standards can be significant in the long run when accounting for increased insurances premiums and accidents." (American Trucking Association & Global Insight, Inc., 2005, p. 2)

The situation in New Zealand is described as follows by Oliver et al. (2003):

"Is there a driver shortage in New Zealand?"

Almost overwhelmingly it was felt that there is a driver shortage, although a considerable number of operators felt that there is only a shortage of good drivers. There would appear to be a large number of 'cowboy' operators and mediocre drivers around and those who are inexperienced and unable/not willing to stay in a job for long. It was frequently said that these 'cowboys' give the industry a bad reputation and thus the just doesn't have a positive image." (Oliver et al., 2003, p. 19)

For *Canada* the Canadian Trucking Human Resources Council (2003) describes a very similar situation as outlined above for Germany regarding the development of the age group ratios of professional drivers compared to Canadians employed. They conducted interviews with different target groups such as drivers and fleet managers. Throughout all interviewed groups a shortage of qualified drivers was pointed out as the key problem rather than the actual quantity of drivers available on the labour market. Just as already indicated for the United States also in Canada the driver shortage seems to have the biggest effect on the long-haul business. The long-haul business also suffers from the highest turnover rates in Canada:

"A large number of the turnover rate is attributable to drivers quitting their jobs. Retirements currently make up only a very small proportion of the turnover rate. The most commonly cited reason for drivers quitting their jobs included wanting better pay, changing occupations (no longer driving), and wanting shorter hours. The most common reason for termination was that the driver was poorly qualified, while the most common reason for layoff was seasonable demand." (CTHRC, 2003, p.1f.)

Despite of all the different backgrounds these countries have in terms of such fundamental aspects as economy, culture, political or education system, they are all facing a very similar situation regarding the shortage of professional drivers that has nearly the same characteristics in all those countries and in Europe. Differences in these characteristics are of course applicable in terms of different legal regulations, wage structures or other aspects. The differences in the vocational education systems might be the biggest challenge in the context of this papers topic, but since the European education systems are already very heterogeneous this is a challenge that has to be kept in mind and dealt with in any case. The similarities outlined above should therefore be strong enough to consider also findings and attempts for solutions from non-European countries when further discussing vocational education and training means to address the driver shortage in the context of this paper.

(3) Causes and strategies

The characteristics described above outline the situation but neither explain where the shortage with its different characteristics comes from nor how the situation can be changed. This chapter therefore explores causes investigated and determined in the different national contexts and coping strategies proposed and implemented.

(3.1) Causes of the professional driver shortage

Studies from Europe and abroad and one meta-study for Europe on the driver shortage have been reviewed regarding the causes they investigated and/or determined for the shortage of professional drivers. The results are displayed in table 3.

Table 3: Causes of the driver shortage identified in different studies conducted within different national contexts grouped into categories (based on: Australia – Australian Trucking Association, 2003; Canada – CTHRC, 2003; Europe – Samek Lodovici et al, 2009; Germany – Klee et al., 2008, BAG, 2007; New Zealand – Oliver et al., 2003; US – ATA & Global Insight, Inc., 2005)

Causes identified in the different studies	ATA (2005) on Australia	CTHRC (2003) on Canada	Samek Lodovici et al. (2009) on Europe	Klee et al. (2008) & BAG (2007) on Germany	Oliver et al. (2003) on New Zealand	ATA & Global Insight (2005) on the US
Weak links between labour market and VET system						
Poorly qualified labour / Missing learning and training culture in the industry	X	X	X	X	X	X
Poor career prospects / Driver occupation not attractive for youth as a career choice	X	X ^a	X	X	X	
Mismatch between vocational education and training offered and industry needs	X	X	X		X	
Increased and changed qualification needs	X		X			X
Lack of encouragement from schools to consider driving as a career	X				X	X
Too little efforts by employers to invest in apprenticeship training	X			X		
Low wage levels and salaries						
Low wage-level	X	X	X	X	X	X
Drivers having the impression that their work is not appreciated		X	X		X	
Negative influence of working conditions on health and social life						
Work-life-balance issues	X	X	X	X	X	X
Hard working conditions such as time pressure, long working hours, difficult sanitary facilities, spending long periods away from home, etc.	X	X	X	X	X	
Negative influence of working conditions on drivers health			X	X	X	
Negative perception/ missing appreciation of the driver occupation within and outside the sector						
Negative public perception/image of the industry/ the driver occupation/ not attractive for youth ²	X	X ^a	X	X	X	
Drivers having the impression that their contribution is not appreciated/ taken serious by others in the industry/ Dissatisfaction with management and general treatment			X		X	
Drivers having the impression they are not properly integrated into supply chain (unrealistic timescales and high penalties)			X		X	
Legal regulations						
Increasing/Changes in legal regulations for drivers		X	X	X		X
Too high and/or expensive entry requirements				X	X	X
Career that cannot be started directly after leaving from school	X					
Macro-economic factors						
Overall aging workforce	X	X	X	X	X	X
Economic growth and transport demands	X		X	X		X
Other factors						
Migration of drivers to other countries					X	
Omission of drivers with license obtained during military service				X		

^a Parents consider driving a truck as "a last resort" rather than a career choice for their children.

Although with differences in the importance, consensus among these studies exists especially regarding the items:

- Missing learning and training culture in the industry/ poorly qualified labour
- Negative public perception/image of the industry/ the driver occupation/ not attractive for youth
- Low wage-level
- Work-life-balance issues
- Hard working conditions such as time pressure, long working hours, difficult sanitary facilities, spending long periods away from home
- Overall aging workforce

In the majority of the items the differences can presumably be caused by the overall focus, purpose, motivation or approach of the study undertaken. As an example, the studies on Germany (Klee et al., 2008, BAG, 2007) do not display the whole scope of causes detected and discussed at different levels of the transport and logistics sector and if further publications would have been considered far more causes would need to be marked as applicable. In other cases it can certainly be assumed that the specific national background brings up a specific item (e.g. "Career that cannot be started directly after leaving from school"). These items are nevertheless kept in the overview in order to provide a coherent picture of the findings.

The table shows that in most of the categories the different related aspects can be consolidated into 2-3 determinants/factors that characterise each category. This is not the case for the category on weak links between labour market and VET system that includes different factors that cannot easily be clustered because they describe different aspects to be considered separately from each other, although they strongly interrelate with each other and with determinants from other categories. At the same time this underlines the importance and the need to strengthen links between vocational education and training and the labour market with regard to professional driving in order to overcome the threats that result from the professional driver shortage. Nevertheless the following three major determinants can be drawn from the causes identified with regard to links between labour market and VET system:

"Poorly qualified labour / Missing learning and training culture in the industry"

This determinant primarily refers to a widely spread attitude in the branch that is based on the assumption that no special training – beside the driving license itself – is necessary and that the necessary competences can (only) be gained through experience on the road (see in this context also "Mismatch between VET and labour market needs" below). This goes along with the factor "Too little efforts by employers to invest in apprenticeship training" that is strongly based on this attitude on the side of employers but also professional drivers. Nevertheless all considered studies indicate a (starting) change regarding this attitude primarily from the side of employers. Indications, if this is also the case for professional drivers themselves, are only rarely described.

"Poor career prospects / Driver occupation is not attractive for youth as a career choice"

This determinant has to be looked at from two different perspectives. On the one hand the lack of attractiveness has to be traced back to a lack of information by teachers (see also factor "Lack of encouragement from schools to consider driving as a career"), parents and youth that is in addition stressed by the negative image of the occupation (Eberhard, Scholz & Ulrich, 2009). Research results provide evidence that drivers rank very low in terms of social prestige of such a career choice for young people (Tomasik & Heckhausen, 2006). On the other hand professional driving as a career does indeed lack career prospects that are a major factor in career choice of young people today (Bauer, 2001; Tomasik & Heckhausen, 2006; Eberhard, Scholz & Ulrich, 2009).

"Mismatch between vocational education and training offered and needs of the industry"

Nearly all studies underline a mismatch between VET schemes offered and the skills, knowledge and competences required from the drivers from the industry. This mismatch can be closely connected to the factor "Increased and changed qualification needs" that are not (fast enough) answered by VET. This mismatch is

primarily underlined in the different studies when it comes to public VET programmes that do – from industry perspective – often not reflect the qualification needs of the industry and are (therefore) not recognised/ accepted by employers and employees. From similar experiences in other branches, it can be surmised that this is caused by rigid procedures in the VET systems and primarily by missing dialogue between VET and industry and missing strong links between profiles/curricula and practical work tasks/ processes in the development and implementation of (public) VET programmes for professional drivers. The interrelation with the poor learning culture in the branch should of course be kept in mind clearly in this context, too.

“Driver health and safety”

Driver health and safety issues are a topic not discussed in the reviewed studies with regard to education but as a result of the poor work conditions. However, this subject becomes more and more also a topic for education and training and is therefore also integrated into this list of topics focusing on links between labour market and VET system.

(3.2) Strategies proposed to approach the shortage of professional drivers

Based on the characteristics of the driver shortage and on the identified causes, different strategies and actions to approach the shortage of professional drivers have been collected and developed in the reviewed studies (see table 4). At this point the differences in the studies become especially evident with regard to the level of elaboration and the focus of proposed strategies and actions. Also the differences in terms of different national realities/backgrounds have a stronger influence and need to be kept in mind in all further consideration of the collected results. Very country specific actions are left aside in this table. Nevertheless they provide a comprehensive overview of options for actions to consider at different levels and by different groups of stakeholders involved in the overall discussion on approaching the shortage of professional drivers.

Table 4: Strategies proposed to address the driver shortage drawn from studies conducted in different national contexts (based on: Australia – Australian Trucking Association, 2003; Canada – CTHRC, 2003; Europe – Samek Lodovici et al, 2009; Germany – Klee et al., 2008, BAG, 2007; New Zealand – Oliver et al., 2003; US – ATA & Global Insight, Inc., 2005)

Strategies and actions proposed in the different studies	ATA (2005) on Australia ^a	CTHRC (2003) on Canada	Samek Lodovici et al. (2009) on Europe	Klee et al. (2008) & BAG (2007) on Germany	Oliver et al. (2003) on New Zealand	ATA & Global Insight (2005) on the US
Strengthen links between VET and labour market						
Create lifelong learning programmes for professional drivers that meet industry needs and are regularly updated to keep track of changes	X	X	X		X	
Develop career opportunities for professional drivers and raise awareness for them	X	X	X			
Encourage life-long learning and the development of a learning/ training culture	X		X			
Open up alternative paths to initial qualification than apprenticeship	X		X	X		
Stimulate use of apprenticeship contracts	X		X	X	X	
Subsidise initial and continuous training/ Make entry in the job more affordable	X		X	X	X	
Facilitate the recruitment of skilled industry personnel as trainers	X					
Encourage use of training under national qualifications framework	X ^b					
Facilitate recognition of qualifications across borders	X ^c					
Develop and introduce profiles that assist employers to recruit skilled, long-term employees	X					
Introduce online training	X					
Encourage in-house training by carriers	X					

Strategies and actions proposed in the different studies	ATA (2005) on Australia ^a	CTHRC (2003) on Canada	Samek Lodovici et. al. (2009) on Europe	Klee et al. (2008) & BAG (2007) on Germany	Oliver et al. (2003) on New Zealand	ATA & Global Insight (2005) on the US
Improve work conditions						
Improving work conditions in terms of work-life-balance	X	X	X		X	
Improving work conditions in terms of less time pressure, better working hours, comfort and safety, better sanitary facilities, spending less periods away from home, etc.	X	X	X		X	
Improve salaries						
Increasing salaries/ open up wage perspectives		X	X	X	X	X
Improve and increase recruitment strategies						
Recruiting drivers from abroad	X		X ^d	X		
Recruiting drivers that left driving back to the job				X		
Recruiting women to the job	X		X			
Offer internships	X			X		
Develop stronger links with schools to promote the occupation	X		X	X		
Participation in job fairs, career talks and awareness campaigns to introduce the occupation properly	X	X		X		
Ensure entrants understand the occupation and the related lifestyle before entering into training/ the occupation		X				
Improve public image						
Improve public image of professional driving to make entry into and stay in the industry more attractive ^e	X	X	X	X	X	
Review language and public images used to describe the road freight industry	X					
Introduce awards for drivers such as on safe and thoughtful driving				X		
Cooperate with media to inform about safety issues, training standards, importance of road freight transport, etc. and run appropriate campaigns and programmes	X			X		
Improve management praxis						
Increase labour efficiency in terms of logistics and organisational management, alternative transport modes			X	X	X	
Improve truck maintenance and provide good equipment		X			X	
Introduce common uniform (transport) road legislation	X ^f		X ^g			
Improve understanding of regulations and drivers work by managers and dispatchers	X				X	
Improve management culture to avoid workplace dissatisfaction (managers show respect and appreciation towards, communicate respectful with and listen to drivers)		X			X	
Introduce a retention strategy such as bonuses, special seniority measures, special benefits, etc.	X	X		X		

^a The study reviewed from Australia includes a concrete Action Plan that is far more elaborated in terms of strategies than the other studies.

^b The Australian report refers to training for professional drivers integrated in the Australian Qualification Framework in order to overcome the industry focus on narrow driving skills. ^c In the case of Australia, State boarders are meant. ^d From outside EU. ^e This general item was integrated due to the different elaboration levels of the studies investigated that do not all make more concrete suggestions. ^f Uniformity between State legislations. ^g Uniformity within EU.

Due to the different characters of the investigated studies, the proposed strategies and actions touch micro-, meso- and macro-level equally and ask employers, social partners, VET providers and respective public institutions as well as governments and their institutions for contribution. Some proposals need to be considered transversal and with consideration of all levels and stakeholders. A majority of introduced actions and strategies proposed in the different studies can therefore only be implemented jointly or at least in dialogue by the different stakeholders involved in order to reach a successful implementation because the individual actions are too closely interrelated with each other.

The differentiation in recruitment and retention strategies/ actions as proposed in different sources is not followed for the purpose of this paper. Because strategies and actions can only to a very limited extent be separated from each other based on the criterion "related to recruitment or retention". Nonetheless this differentiation is very useful and important when it comes to strategies introduced and implemented at micro-level by companies employing professional drivers in order to recruit and retain their personnel.

(3.3) The role of vocational education and training

The following strategies/actions extracted from table 4 are closely related and/or an integral part of vocational education and training work and will therefore be considered for further investigation. The largest part of suggested actions and strategies that relates to vocational education and training refers to the encouragement of life-long learning and the establishment of a learning/training culture in the occupation that was already singled out as a cause for the driver shortage above. Since this is nevertheless rather an aim than an action the following strategic activities to reach this aim can be drawn from the suggested actions in table 4:

- Develop lifelong learning programmes for professional drivers that meet industry needs and are regularly updated to keep track of changes

The majority of studies indicate that VET programmes currently offered often do not correspond with the labour market needs or are out of date. Furthermore further encouragement and facilitation of apprenticeship training, internships but also alternative paths (for newcomers above typical apprenticeship age or changing occupations) for initial VET are proposed in order to introduce and prepare newcomers into and for the job. Online training is specifically proposed in order to provide training for the big group of professional drivers, but at the same time the implementation of in-house training is proposed in order to decrease obstacles that result from unfamiliar training situations for drivers. (See also Gijssbers, de Jong & Gelderblom, 2006)

- Open up career opportunities/ paths for professional drivers

The establishment of career opportunities for professional drivers is introduced as a measure to attract young people to professional driving by demonstrating the occupation being no dead end or last resort for people without specific professional skills, but an occupation that has an interesting career perspective, if they want. At the same time it is suggested to facilitate driver retention because it can open up opportunities for drivers' to get their abilities recognised and for possible progress without necessarily changing the branch. The Australian report (Australian Trucking Association, 2003) proposed in this context the recruitment of skilled industry personnel as trainers being a possible career opportunity for drivers and the use of National Qualification Frameworks as reference for professional drivers training in order to facilitate permeability and career opportunities.

Beside these very VET specific actions and strategies, also the following suggested actions should be further reflected in terms of vocational education and training support possibilities:

- Employer support in human resource management (recruitment, retention, etc.) with regard to professional drivers and management of turnover

This action proposes the development of tools (such as profiles) that assist employers to recruit skilled, long-term employees, but also training, information and consultation offers for employers and related occupations on legal regulations, management culture and employee satisfaction, retention strategies.

- Addressing health and safety topics within professional drivers' vocational education and training
Just as with regard to the determinants outlined above also here the topic of health and safety training for drivers has been added as a suggested action to facilitate overcoming of the driver shortage with VET means. This topic becomes especially prominent due to the aging workforce within the driver profession and the increased risks of professional drivers to suffer from occupational diseases and changes of profession (Houtman, van den Bosche, Hesselink, van den Berg & van den Heuvel, 2004; Nolle, 2005). The European Agency for Safety and Health at Work (2011) asks to address „issues such as violence, dealing with customers, and the adaptation to the constantly changing conditions and safety requirements of the working environment ... by training and skills development“ (European Agency for Safety and Health at Work, 2011, p.246). It is therefore only natural to add driver health and safety training to this list of VET means to address the driver shortage in order to enable drivers to cope with these challenges and therefore to remain longer in the job.
- Worker mobility and transparency of qualifications across borders
Mobility of workers across borders becomes more and more relevant as a measure to address labour shortages in different branches and different parts of Europe. Professional driving is an occupation that especially within the long distance branch is anyway not limited to a specific country, but requires from workers to cross borders as part of their daily job. The step to work also in another country is therefore far shorter than within other occupations and sectors, but needs to be facilitated by transparency, comparability and even recognition of the qualifications a person possesses.
- Awareness raising for and information on job requirements and training/qualification standards
The different studies indicate that recruiting young people for professional drivers is especially difficult because there is a huge lack of knowledge about the occupation among youngsters, parents, career counsellors and teacher being or supporting within the career choice process. This lack of knowledge needs to be closed in order to raise awareness for this occupation already at an early stage of careers.

(4) Vocational education and training means to approach the shortage of professional drivers in Europe

While the previous chapters applied a rather global view on the professional driver shortage, this chapter reviews and discusses the findings and considerations in relation to the situation in Europe and specifically to the countries represented in the ProfDRV project. Furthermore it makes suggestions and gives examples for opportunities to approach the shortage of professional drivers in Europe with different VET means that are partially strongly interrelated with each other.

(4.1) Vocational education and training based on labour market/ industry needs

The previous research results and explanations indicate that the professional driver shortage is primarily a qualitative shortage in terms of a mismatch between knowledge, skills and competences required by industry/ the job and offered by professional drivers on the labour market. This makes a review of VET programmes offered by vocational education and training (public and private) useful regarding their ability to answer labour market needs and expectations and, if necessary, to suggest modifications based on labour market needs². In order to do this

² This is partially done in the framework of the ProfDRV workpackage 3. WP 3 investigates the actual work tasks of professional drivers and draws conclusions what knowledge, skills and competences need to be trained in order to fulfil these tasks.

interviews and desk research have been conducted by the ProfDRV partners to further elaborate stakeholders points of view to what extent different VET schemes for professional drivers meet the jobs/ industry requirements:

Germany: *Different kind of stakeholders (employers, social partners, drivers, training providers) indicated that the initial training based on directive 2003/59/EC is not sufficient in order to perform competently as a professional driver, at the same time they nevertheless recognised that with this training at least all new drivers receive some kind of vocational training as a professional driver before entering into the job. At the same time the apprenticeship/ occupational re-training scheme "Berufskraftfahrer"/ professional driver that has been developed as a result of the social dialogue has been rated to meet the jobs requirements and therefore to prepare for the job properly. However, it needs to be considered that only a relatively small number of drivers chose to attend this non-compulsory VET scheme and has very little acceptance in the branch. Continuous training has been offered to drivers especially by medium-size and big companies already before directive 2003/59/ECs implementation. A part of the interviewed employers complained that the periodic training moduls should be more flexible in order to really meet the labour markets skill requirements.*³

Hungary: *"Initial qualification was and is relatively short in Hungary and a kind of "best practice" and "learning by doing" approach developed over the years in order to prepare new drivers for the job. However, topics such as load security are considered as important, but knowledge is missing. Drivers are usually aware of their lack of knowledge in relation to some colleagues on international level, but are at the same time proud of their job and do believe that they do it well [...] Another opportunity to become professional driver was and exists in Hungary. In direct comparison to the system setup by NKH [to implement directive 2003/59/EC] it is a by far longer, from a certain perspective deeper going education of up to 600 hours out of which 70% are theory and 30% practice. This is a so called OKJ-education (Országos Képzési Jegyzék) and as such part of Hungary's national qualification framework and linked to the Ministry of Education. It is, however, not in demand at all, as everybody votes for the shorter and cheaper solution of NKH. Additionally it is told that the OKJ-education is not reflecting the needs of the nowadays job profile of a professional driver..."*⁴

Italy: *"Most of the stakeholders agree on the same point: such programmes [mandatory training for professional drivers] don't meet in fact labour market needs [...] Training should be more practical oriented."*⁵

Netherlands: *"In the Netherlands the driver CPC exists already more than 40 years and social partners are involved in setting the standards for the examination of private and public courses with regard to drivers vocational training."*⁶

Spain: *"Drivers and employers believe it is not oriented to the real needs of the professional drivers. They demand more practical training, focused on real situations which can appears when they are developing their work. Also, they remark it is necessary to improve the knowledge of the professionals on laws, regulations, sanctions..."*⁷

UK: *"The NVQ (National Vocational Qualification) system was created back in 1992. It continuous to offer formal qualifications for a range of industries (including transport and logistics) which can be achieved at college or by way of apprenticeship at work. However, the framework is broad, the syllabus rigid and popularity still comparatively low. The Directive offers more flexibility to a wider range of ages while maintaining the focus on business rather than education."*⁸

The collected data indicates that qualifications that have either been developed in a process of social dialogue such as in the case of the Netherlands or the German apprenticeship/re-training scheme or that are flexible enough to be easily adjusted to industry needs (see UK case) are considered to meet labour market needs in

³ Interviews and desk research for Germany have been conducted and analysed by DEKRA Akademie GmbH and ITB (both DE).

⁴ Interviews and desk research for Hungary have been conducted and analysed by DEKRA Albasafe Akademie Kft. (HU).

⁵ Interviews and desk research for Italy have been conducted and analysed by TkF (IT).

⁶ Information for the Netherlands has been provided by VTL (NL).

⁷ Interviews and desk research for Spain have been conducted and analysed by ASIMAG (ES).

⁸ Information for the UK has been provided by FTA (UK).

terms of qualification requirements. While those qualifications introduced in a top-down process such as in the example of the mandatory training in Italy or the directives training schemes in Germany are evaluated by stakeholders to be not sufficient to meet the labour markets qualification requirements on professional drivers although they are considered to be a start into the right direction.

The German case indicates that with regard to professional driver training also a qualification that is considered to meet the qualification needs such as the German apprenticeship scheme for professional drivers is not instantly accepted by the branch. This can primarily be reasoned by the generally missing learning culture in the branch (Houtman et al, 2004) that rather builds on learning by doing (see the Hungarian case) than on systematic training approaches and the sectors generally rather little investment in the training of professional drivers so far (Gijsbers, de Jong & Gelderblom, 2006).

However, recent observations in Germany and other especially Western European countries indicate that the increased qualification requirements on professional drivers over the past years and the shortage of qualified workforce start to change this situation and raise employers' awareness for the need to train professional drivers properly for the execution of their job. The study implemented by Gijsbers, de Jong and Gelderblom (2006) even predicts for different economic scenarios with regard to road transport that qualification requirements on professional drivers will strongly increase in future. This does especially apply to abilities that refer to coping with stress, self management, planning skills, social (communication, teamwork) and intercultural competences. Furthermore e-skills and technical competences (Gijsbers, de Jong & Gelderblom, 2006) and learning abilities will play a more prominent role in future (Liebel & Hofmann, 1998). But also the broadening of drivers' tasks within the logistical chain with tasks that precede or succeed the actual transport of goods might play a major role in future and should be further investigated and monitored with regard to drivers qualification needs. These findings indicate that in future even more attention needs to be paid to the constantly changing work and increasing qualification requirements and therefore to the continuous update of initial and continuous training (standards) for professional drivers in order to ensure drivers employability in a constantly changing industry.

It also needs be kept in mind that especially initial vocational training schemes for professional drivers need to be corresponsive to different groups of participants (age, ethnical and social background) in such training as especially the UK case raises. In order to decrease the shortage of professional drivers it is necessary to recruit possible drivers with different professional backgrounds. Those groups are primarily workers from other sectors (Gijsbergs et al. (2006) consider this group as rather unlikely due to higher wage levels in other sectors), workers from other countries, unemployed and young people from the education system (Gijsbergs et al., 2006). Therefore especially IVET (initial vocational education schemes) schemes need to be strongly corresponsive to the requirements of these different groups in terms of methodical approaches applied (apprenticeship, full time training, traineeships, etc.) and in terms of training content (e.g. language training for workers from other countries or general vocational training for young people coming from the general education system). But also the scope of methods to be applied in IVET and CVET (continuous vocational education and training schemes) needs to be appropriate for the special needs of professional drivers being a professional group with a low status of education and learning (e.g. by applying very practice-oriented and learner-centred instruction instead of teacher-centred instruction such as lecturing) as well as appropriate for the branch that is strongly characterised by SMEs all over Europe (e.g. by opening up distance learning opportunities).

(4.2) Career paths as a way to make professional driving more attractive to youth and to keep experienced drivers in the branch

The necessity to provide the conditions for recognising professional driving as a career with opportunities for occupational development and progression was pointed out in different studies as a fundamental step in order to recruit (young) people for the occupation, retain them in the branch and also to raise the image of the professional driver within the sector and in general (see also Gijsbers, de Jong & Gelderblom, 2006).

Publications (see among others European Agency for Safety and Health at Work, 2011) indicate that such career perspectives are, however, not given with regard to professional drivers. The following information on career and/or further education perspectives have been collected by the ProfDRV project partners:

Austria: *Possibility to obtain certificate approving competences in the commercial cargo transportation ("Befähigungsnachweis Güterbeförderung") through an exam, this certificate is the basis to obtain a business license for the commercial cargo transportation. Furthermore "drivers can work for a cargo agent or they can change to the passenger transportation. The experts see very few possibilities for the drivers to exercise another profession or to advance in their career. One stakeholder of a logistics company said that there are very few of his drivers who wish to change their profession or are ambitious enough to work their way up."*⁹

Germany: *Possible education pathways are the industrial master road transport (Industriemeister Kraftverkehr) (vertically) and the possibility to work just informally and as unskilled worker in warehouses or as fork-lift drivers (horizontally). The interviewed employers don't see any career opportunities for drivers neither in general nor within their own company. The only chances they see are to work as warehouseman or fork-lift driver. Drivers have a similar perception of their opportunities although all would strongly welcome such possibilities. Only three of the interviewed drivers who were currently in further training schemes (industrial master road transport) or had already considered to take the "next step" saw opportunities via further education in order to work as scheduler, trainer or fleet manager based on their experience as professional driver. Nevertheless all three considered such ways as very difficult because of little support by (possible) employers, who rather want to keep them as drivers or who are reluctant to hire them for such a position because they have been drivers and might rather stand on the "side" of the drivers when taking decisions.*¹⁰

Hungary: *"Drivers can go for specialisations, as for instance do ADR training (CPC needed) and trainings for the transport of heavy load and other special wastes. As many drivers run an own, small (family) company with 1 or 2 trucks, there are also shorter trainings offered for entrepreneurship. [Furthermore] no real career opportunities are given to drivers, in case they do not work as independent entrepreneur for their own company and manage to grow significantly. Very rare cases manage to end up on the lower management level of bigger haulier companies."*¹¹

Italy: *"Professional drivers don't have career opportunities/pathways besides professional driving. Who starts as professional driver, continues this job until the retirement. Just if the company he/she is working with is owned by his/her family, he/she can later become owner/employer and stop driving. Driving is a hard job, so many drivers would like to be able to stop driving in order to do something else, more satisfactory, in the frame of their employers company or – more generally – in the branch (like having their own company). Not having education/career pathways is a big issue."*

Netherlands: *"A minority of drivers can become dispatcher. You do not need, however, extra training or an extra qualification. It is possible to become a dispatcher based on expertise and experience. This pathway becomes more difficult due to the fact that one dispatcher can control more dispatchers than in the past. [...] we see changes in the rosters of drivers: due to the 48hrs regulations and part time working contracts. [Furthermore] more drivers like to specialise: distribution, heavy haulage, tankers ..."*¹²

Spain: *"In general terms they do not have opportunities to develop a professional career. In some particular cases they can become in "head of traffic", but there is not a career pathway for the professional drivers. Who starts as a professional driver, continues with his job (excepting those drivers who become owners or employers)."*¹³

⁹ Interviews and desk research for Austria have been conducted and analysed by 3s research laboratory (AT).

¹⁰ Interviews and desk research for Germany have been conducted and analysed by DEKRA Akademie GmbH and ITB (both DE).

¹¹ Interviews and desk research for Hungary have been conducted and analysed by DEKRA Albasafe Akademie Kft. (HU).

¹² Information for the Netherlands has been provided by VTL (NL).

¹³ Interviews and desk research for Spain have been conducted and analysed by ASIMAG (ES).

UK: *“Professional driver training programmes have been in place for many years now, but they were only ever introduced, managed and run by private transport companies. Other industry qualifications relate to management or director level careers so obviously they have no relevance to a professional driver. A driver’s career would normally progress one of two ways; by increasing their entitlement to drive longer or heavier vehicles (through the driver licensing system) from an early stage or by progressing up through the company having started on warehouse fork-lift trucks or similar vehicles. The opportunities for vertical advancement tend to be good, as long as a driver is prepared to stay with the company. The other way in which a driver will progress is through development into a driver trainer, a driver champion (someone who represents the drivers and may act as a senior driver responsible for induction training or special transport requirements). ... There are really two types of pay grade; general hauliers will earn around 40% less than tanker drivers, as a result of the dangers associated with driving a vehicle that contains vast amounts of volatile, flammable liquid. Typically a pay rise will occur as a result of longevity of service and / or for journeys made internationally that require nights away from home. ... The methods used represent widespread industry practice, and as they have proved successful in progressing driver careers the industry would be reluctant to make any changes.”¹⁴*

These research results collected in the framework of the ProfDRV project confirm that such further education and career opportunities are not or only to a very limited extent available and/or accepted in the countries investigated, maybe with an exception being the UK and partially the Netherlands.

However, there can be different trends suspected from the results in terms of possible career prospects for professional drivers that are not formalised but nevertheless arising within the industry:

- Specialisation within the driver profession (heavy-haulage, tankers, etc.) that is in some countries also connected to a different pay level (see also Liebel & Hofmann, 1998)
- Professional advancement following career steps into management positions such as team leader/ senior-driver, fleet manager or dispatcher
- Advancing into training positions within haulage companies or training providers
- Changing from an employment- to an owner-operator-status, the owner-operator stops driving at the certain point of time when he has a certain number of trucks running within its company and changes into a management position

It can therefore be claimed that professional driving is certainly not a dead-end job as it is often perceived by young people, their parents and professional drivers themselves, but has the potential for a professional career. However, the results also indicate that industry needs to realise/ open up such career prospects for qualified professional drivers as it is done in some of the cases displayed above and as they are existing in many other professional areas. At the same time, of course, such opportunities (once they exist), the related requirements and qualification schemes need to be properly communicated to job-seekers in order to have the desired effect on the driver shortage in terms of making the profession more attractive especially for young people, but also in order to avoid the outflow of personnel e.g. by involving experienced drivers as training supervisors into the training of newcomers (Dierks, 2011).

But not only career opportunities are very limited for professional drivers, also formal further education opportunities that might facilitate such professional advancement are very rare in the investigated countries. Only for Germany a formal qualification scheme that primarily targets professional drivers has been reported with the industrial master road transport. This qualification scheme intends to open professional drivers’ advancements into management and training positions. Also the certificate as road haulage operator regulated by directive 96/26/EC is partially considered as a formal further education opportunity for professional drivers in line with the possible advancement to become owner-operator within trucking, just as a number of training courses that allow specialisation such as dangerous goods, heavy vehicle, long combination vehicles, tanker, (truck-mounted) crane.

¹⁴ Information for the UK has been provided by FTA (UK).

These results indicate that this specific field of VET means to approach the professional driver shortage still provides a large scope for action and improvement especially under consideration that Europe-wide National and Sectoral Qualifications Frameworks are currently discussed, developed and introduced that might facilitate the process of establishing career opportunities for professional drivers from the vocational education side. The examples below show such examples from Canada, South Africa, New Zealand and the UK how such career/ education pathways have been developed in practical terms and partially in the form of qualifications frameworks by taking up one or more of the trends described above.

The Canadian Trucking Human Resources Council outlines possible career paths in the *Canadian* trucking industry among others also for professional drivers (see figure 3). Beside the displayed vertical and horizontal career paths also paths to dispatching, warehousing and other management and support positions are described for the different kinds of driving positions.

While the example from Canada is only partially related to formal vocational education and training and primarily describes career paths from the industry perspective, examples from New Zealand and South Africa provide a first view how career paths in the field of transport can be integrated in the logic of qualification frameworks.

In the case of *South Africa* the national certificate "Professional Driving" is allocated to level 3 of the South African Qualifications Framework (SAQA, 2009). The South African NQF has 8 levels: level 1 – general education and training; level 2-4 – further education and training/ VET; level 5-8 – Higher Education (SAQA, 2011). Holders of the national certificate "Professional Driving" have horizontally access to the National Certificates on "Freight Handling", "Road Transport" and "Maintaining Vehicles" and through the Fundamental component included in this certificate also to all other NQF Level 4 qualifications.

The example from *New Zealand* goes one step further and introduced qualifications on 5 levels of the New Zealand Qualifications Framework that "have been purpose-built to fit the needs of the New Zealand road transport sector" (TransquallTO, 2011, p.1). The New Zealand Qualifications Framework has 10 levels (NZQA, 2011): level 1-4 being national certificates, level 5-6 national diplomas and level 7-10 degrees and post graduate programmes up to doctorate level. The road transport certificates and diplomas are (TransquallTO, 2011):

- Level 1:
 - National Certificate in Commercial Road Transport (Introductory Skills) [NQF 0189]
 - National Certificate in Transportation of Waste and Recoverable Resources (Solid Waste) with Light Motor Vehicle strand [NQF 1232]
- Level 2:
 - National Certificate in Goods Service (Core Skills) with optional strands in Dangerous Goods, and Forklifts [NQF 1227]
 - National Certificate in Commercial Road Transport (Courier Driver) with strands in Urgent Operations, and Non-urgent Operations [NQF 1084]
 - National Certificate in Driving (Light Motor Vehicle) [NQF 0796]
- Level 3:
 - National Certificate in Transportation of Logs by Road [NQF 1464]
 - National Certificate in Driving (Four Wheel Drive (4WD) Vehicle) [NQF 1274]
 - National Certificate in Commercial Road Transport (Ground Spreading) [NQF 1018]
 - National Certificate in Transportation of Waste and Recoverable Resources (Liquid and

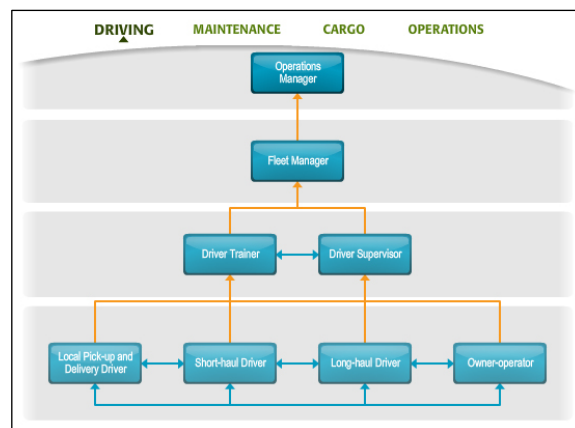


Figure 3: Career paths in trucking industry for drivers introduced by CTHRC, CA (taken from www.truckingcareers.ca)

Hazardous Waste) [NQF 1226]

- National Certificate in Goods Service (Heavy Vehicle Driver) with strands in Heavy Rigid Vehicle, and Heavy Combination Vehicle, and with optional strands in Transportation of Bulk Dangerous Goods by Road, Transportation of Livestock by Road, and Transportation of Perishable Products by Road [NQF 1228]
- National Certificate in Business (First Line Management) (Level 3) [NQF 0743]
- National Certificate in Transportation of Waste and Recoverable Resources (Solid Waste) with Heavy Motor Vehicle strand [NQF 1232]

- Level 4:
- National Certificate in Heavy Haulage (Class 1 Pilot) [NQF 1353]
 - National Certificate in Heavy Haulage (Transportation) with an optional strand in Abnormal Loads [NQF 1354]
 - National Certificate in Road Transport Management (Operations) (Level 4) [NQF 1209]
 - National Certificate in Driving (Education and Assessment) with strands in Light Motor Vehicle, Heavy Motor Vehicle, On-road Motorcycle, Off-road Motorcycle, Quad Vehicle, Four Wheel Drive (4WD) Vehicle, and Driver Educator [NQF 0793]
 - National Certificate in Business (First Line Management) (Level 4) [NQF 0649]

- Level 5:
- National Diploma in Road Transport Management [NQF 0961]

The different certificates (and respective qualifications) are interrelated with each other and across levels. They therefore allow a career/education path within road transport industry starting with a certificate that demonstrates the abilities to be employed as a trainee driver on level 1 up to the National Diploma in Road Transport Management on level 5 of the New Zealand Qualifications Framework.

A similar approach has been applied by Skills for Logistics (UK) for the UK logistics sector by establishing a "Professional Development Stairway" being linked to the National Qualifications Framework. The developed Stairway equals a competency framework, with the competences being based on the relevant National Occupational Standards being the basis for qualifications across the UK (Skills for Logistics, 2010).

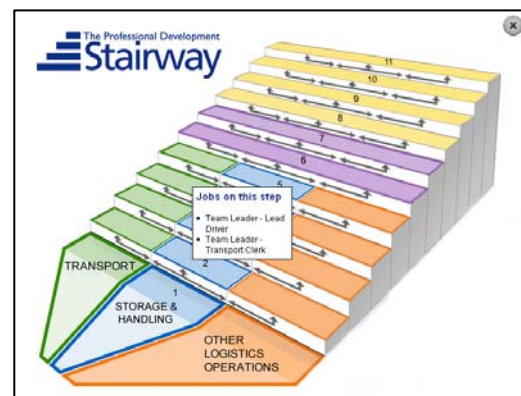


Figure 4: The Professional Development Stairways (taken from www.thestairway.org/career-paths)

... the Stairway shows how a motivated person may enter the industry as a driving apprentice and progress to such posts as driving supervisor, transport manager and ultimately into senior management in a logistics company." (Skills for Logistics, 2005, p.14). It leads through the following levels:

- | | | | |
|----------|--|-----------|---|
| Level 2: | <ul style="list-style-type: none">• Trainee Driver• Trainee Courier | Level 6: | <ul style="list-style-type: none">• Transport manager• Warehouse manager |
| Level 3: | <ul style="list-style-type: none">• Operative Courier• Operative Driver• Operative Transport Clerk | Level 7: | <ul style="list-style-type: none">• Depot Manager• RDC Shift manager |
| Level 4: | <ul style="list-style-type: none">• Team leader – Lead Driver• Team leader – Lead Transport Clerk | Level 8: | <ul style="list-style-type: none">• General manager |
| Level 5: | <ul style="list-style-type: none">• Transport Driver Trainer• Transport Supervisor | Level 9: | <ul style="list-style-type: none">• Logistics Divisional/ Regional Director |
| | | Level 10: | <ul style="list-style-type: none">• Logistics Director |
| | | Level 11: | <ul style="list-style-type: none">• Global Logistics Director (EMEA) |

Furthermore the transport qualifications are interrelated with qualifications related to "Storage & Handling" and "Other Logistics Operations". All three areas "Transport", "Storage & Handling" and "Other Logistics Operations" lead through the same steps from level 6 upwards.¹⁵

The links between industry and education are different within these four examples.¹⁶ Clear links are described for the examples from New Zealand and UK. The Canadian example is strongly industry driven and the South African example seems education driven, but there are no indication regarding industry links. The Canadian and the UK example both reflect clear career steps in terms of (management) hierarchies in a company but the New Zealand example adds an additional component by outlining different kind of drivers dependent on the kind of truck driven and on trailer and cargo and refer those different kinds of drivers to different qualification framework levels. Professional driving is in all examples interrelated with other logistics occupations/qualifications and the frameworks/ career/education paths open up mobility opportunities between the different logistics areas. Only the South African framework opens an additional reference from driving to vehicle maintenance.

(4.3) Employer support in human resource management (recruitment, retention, etc.) with regard to professional drivers and management of labour turnover

The ProfDRV partner from Canada – the CTHRC – detected serious deficits within their trucking industry in terms of human resource management in the framework of their studies about human resources in the Canadian trucking industry. These deficits have huge effects on the overall driver shortage and in particular on the high turnover rate in the Canadian trucking industry. The other studies reviewed in chapter (3.1) support that these human resources issues are not limited to Canada, but exist in the trucking industry in other parts of the world as well. Unfortunately this dimension has not been explicitly researched within the ProfDRV projects framework, but the available results, further studies (see Samek Lodovici, 2009) and recent publications in relevant media (Bergrath, 2012) allow for the argumentation that human resource management aspects are also deficits within the European trucking industry that strongly reinforce the driver shortage. Nevertheless such considerations that address driver retention and reduction of turnover are still underrepresented within human resources practice especially compared to strategies about improving recruitment of professional drivers.

This aspect is especially challenging because human resource management/development has a generally rather low significance within the trucking industry, and also because this sector is strongly characterised by SMEs but contains also bigger enterprises with different requirements on human resource management aspects. These different types of enterprises of course require different strategies for their human resource development activities. Further research is therefore strongly recommended in order to elaborate this dimension in more detail and specifically for the situation in Europe.¹⁷

(4.4) Addressing health and safety topics within professional drivers vocational education and training

Occupational health and safety instruction plays in all surveyed countries a role in terms of health and safety during operating machines and vehicles and in terms of general occupational health and safety issues on the workplace. Those trainings are partially mandatory instructions to be implemented by law. This includes training on topics such as defensive driving, fire risk prevention, dangerous goods, first aid, safe loading and safe coupling/uncoupling.

However, training referring to a healthy lifestyle in terms of nutrition, fitness and ergonomic work habits is implemented only to a very limited extend, although it plays an important role within an occupation with a strongly aging workforce such as professional driving in order to remain healthy to carry out the job also at older age. But

¹⁵ Reference to UK NOF levels unknown (see <http://www.qcda.gov.uk/resources/assets/qca-06-2298-nqf-web.pdf> for further information).

¹⁶ A similar sectoral qualifications framework approach is applied in France under the coordination of AFT-IFTIM (FR). See also <http://www.aft-iftim.com/>.

¹⁷ The ProfDRV project partner CTHRC (CA) is currently investigating qualification needs of dispatchers among others regarding drivers retention and management of driver turnover because the dispatcher has been analysed to be a key position with high relevance for drivers retention and turnover within the Canadian research in this field.

also topics such as dealing with violent situations on the road, with irregular working hours or fatigue are only rarely addressed within training.

Some business cases such as the SITA vitality programme in the Netherlands (Bakker, 2011) or different company, press, insurance and VET provider initiatives in Germany (see among others Bergrath, 2011/a/b/c) and the integration of this topic into directive 2003/59/EC nevertheless show that there is more and more awareness for the necessity to provide additional support and training to drivers in terms of practicing a healthy lifestyle also while being on the road. Nevertheless also this is still a major area of work that can and should be further addressed by vocational education and training for professional drivers as a possible contribution against the drivers shortage in cooperation with the appropriate partners such as the different related insurances.

(4.5) Further activities implemented in the ProfDRV partner countries to address the driver shortage

Besides the previously described and discussed VET measures against the driver shortage a number of other more or less VET related measures are implemented in the investigated countries in order to address the driver shortage:

- **Reporting about professional driving in mass media**
A majority of the interview partners raised the bad reporting in mass media about trucking as a crucial issue that strongly increases the professions bad image and therefore also the driver shortage. An Austrian stakeholder describes it as follows: "Labour perception in the public contribute to the bad image of truck drivers. Many accidents are mentioned in the press, which proves an intentional negative prejudice towards the profession. The political approach has to be changed fundamentally, to raise awareness about the importance of the profession."¹⁸ As an example for a campaigning strategy against this bad image within mass media, the Canadian ProfDRV partner CTHRC introduced the "If you got it, a truck brought it" slogan in order to raise public awareness for the importance of trucking for society, but also TV broadcastings about trucking that present professional driving from a more positive side might be helpful in order to increase the occupations image.
- **Appearance of drivers in public**
Similarly, the necessity of a generally smarter driver appearance in public is pointed out by several of the interviewed stakeholders in order to raise the public image of professional driving as an occupation through actions that can be contributed by the drivers themselves. This has e.g. been described as follows: "... a profile of some of the exciting roles that a road haulier will find themselves in, comparison with air cargo pilots or ship's captains and an injection of pride in what the driver does"¹⁹.
- **Awards**
Another common practice to increase drivers reputation are different awards that are e.g. implemented in Germany and Canada by or with the trucking industry such as the Canadian "Hero Award recipient", the "EuroSkills"-initiative or "V-top" in Germany. However, these initiatives need to be further evaluated to what extend they reach a wider public outside the industry.
- **(Recruitment) Campaigns**
Different kind of recruitment campaigns targeting groups such as women, immigrants, unemployed, young people in school or part-time workers are implemented in Austria, Germany, UK and the Netherlands. The German stakeholders e.g. reported that they participated in recruitment and career events in order to inform about professional driving as a possible career choice and the Canadian partner implemented the "Road Knights" programme, in which professional drivers attend schools and events in order to promote the industry and professional driving to the general public.

¹⁸ Taken from the Austrian contribution to this paper, p.6

¹⁹ Taken from the UK contribution to this paper, p.4

- Employment agency measures
Financial support from employment agencies for unemployed to obtain the appropriate driving license and/or vocational training has been implemented as a measure against the driver shortage in some of the researched countries.
- International mobility of professional drivers
Another measure that is considered by some of the employers is the recruitment of drivers from abroad, this does of course require additional training especially with regard to language skills and intercultural competences in order to facilitate foreign workers integration into their work and life environment, their general vocational training in order to meet the national labour markets requirements but also additional support to settle down with their families in another countries might be a necessary related measure.
- Offering other models of work organisation
The introduction of part-time work also plays a role in order to decrease the driver shortage especially in order to allow older drivers to stay in the branch.

(5) European instruments and their role to approach the shortage of professional drivers

A number of instruments have been introduced from European level directly targeting professional driver qualification or vocational education and training in Europe in general. With regard to specific instruments regulating professional driver training only directive 2003/59/EC will be discussed at this place because it has the biggest scope and impact on professional driver qualification in Europe at this point in time. It should nevertheless be mentioned that professional driver VET is influenced by European regulation already since 1976 with different directives regulating certain kind of continuous training for professional drivers in Europe. Furthermore the (potential) role of the European Qualifications Framework (EQF) and of the European Credit System for Vocational Education and Training (ECVET) will be discussed. Both instruments intend to facilitate mobility of workers in (and partially also beyond) Europe by making qualifications transparent across borders. This has of course a special connotation in times and in terms of skills shortages in different branches and therefore also in the logistics and transport sector.

(5.1) Professional driver initial and periodic training based on directive 2003/59/EC

This European directive is very controversially discussed by the different stakeholders with regard to their contribution to the driver shortage. Some claim that the introduction of a common and mandatory driver CPC will increase the driver shortage because it puts an additional entry barrier in place especially for career changers who have been a major source of professional drivers in the past or might even threaten national transport markets as it is e.g. argued for Poland (Mitraszewska, Nowacki & Kaminski, 2008) with regard to the missing infrastructure to implement the directive. Others argue that the driver CPC makes an important contribution to better qualified drivers and will therefore increase drivers' employability, but also the overall profile and reputation of this occupation as a job that requires proper training in order to be performed.

At this point in time it is still too early to conclude what effects the directive will have on the driver shortage and if the directives implementation succeeds to increase employability of professional drivers or has the desired effect to raise the occupations profile and image in the long run. The results of the conducted research²⁰ indicate strong reservations towards the directives efficiency especially from employers and drivers. They primarily perceive it as an additional burden they have to comply with rather than an opportunity to raise the occupations profile and to increase drivers' employability, especially under the consideration that the application approaches vary strongly

²⁰ Please also see the different country case studies developed within the ProfDRV project for Austria, Germany, Hungary, Italy, the Netherlands and the UK at <http://www.project-profdrv.eu/index.php?id=39> for further information

among the different European countries and seem not to lead to a homogeneous basic qualification level of professional drivers.

Although directive 2003/59/EC can be discussed controversially in terms of its contribution to the driver shortage it should be strongly considered that in many European countries there has been no vocational initial or even continuous training for professional drivers at all in the past. Therefore the introduction of such a training scheme is already a huge step forward in order to ensure a basic vocational training for all professional drivers in Europe especially in these countries. But the success of its implementation in terms of ensuring a qualified workforce within professional driving based on the labour markets needs is strongly dependent on the way how it is implemented in the different countries, how it is integrated into the existing vocational education and training systems and what other measures against the driver shortage are put in place alongside this European initiative because the directive itself can in any case only be considered as a start that requires additional steps in order to effectively address the professional driver shortage. The previous chapters, but also the remaining (and upcoming) publications from the ProfDRV project²¹, provide some references what steps could be further considered at European, national and company level in order to further address the professional driver shortage based on directive 2003/59/ECs first initiative and especially under consideration of vocational education and training expertise with regard to developing and implementing vocational training that likewise meets labour market and workers needs and interests.

(5.2) The European qualifications framework for lifelong learning (EQF) and the European credit system for vocational education and training (ECVET)

The concept of qualifications frameworks is not new to the transport and logistics sector and it is not by coincident that the logistics sector is one of the most researched sectors with regard to the application of these instruments in vocational education and training practice especially due to the sectors' special European dimension and characteristics. It is therefore self-evident to consider these instruments in the context of professional drivers' qualification as well.

The examples in chapter (4.2) show that especially sectoral qualifications frameworks can open up and display career and education pathways for employees in a sector because they put qualifications into relation to each other and can also (potentially also under consideration of ECVET points in order to enable learners mobility across borders/ recognition of qualification elements obtained abroad and the recognition of non-/informal learning as it is very common practice within professional driving) facilitate vertical and horizontal permeability between qualifications and qualification levels. This can of course strongly contribute to the career prospects and their potential influence on the attractiveness of the driver occupation as it has been argued in the previous chapters.

But not only the integration of professional driver qualification schemes into a sectoral qualifications framework might be beneficial in order to raise the occupations perception in public, it could already be a very important step to integrate the different vocational education and training schemes into national qualifications frameworks as the findings in the UK propose in terms of the possible assignment of the driver CPC to an national qualifications framework level: "82% of employers were aware that in certain circumstances the Driver CPC can count towards an S/NVQ (Scottish/National Vocational Qualification) Level 2³ qualification. This route would go some way in achieving the aim of helping to recognise and accredit the skills of professional drivers." (Skills for Logistics, 2009, p.6)

Most of the qualification schemes for professional drivers incl. those that implement directive 2003/59/EC are strongly input oriented and rather focus on the number of hours spent with training rather than on the actual learning outcomes or abilities an individual has. But the abilities an individual has (the learning outcomes) after completion of a certain learning process are this what makes qualifications comparable rather than the numerous

²¹ See <http://www.project-profdrv.eu/index.php?id=39> for further ProfDRV publications.

ways how qualifications can be implemented in different national and institutional contexts as the driver CPC example shows. A proper application of the learning outcomes approach has of course special requirements on the way how learning outcomes are defined and assessed²², but also on the way how training is implemented. All these requirements that go along with such an output oriented approach could be very beneficial for the overall implementation of directive 2003/59/EC considering the reported difficulties²³ with regard to the overall quality of its implementation.²⁴

These proposed measures are of course activities that are neither implemented at short notice nor will they show effects in the short run but they might have the potential to make a significant contribution to well qualified workforce at a long-term perspective by making the occupation more attractive to young people and by implementing quality training that meets the needs of the industry.

(6) Conclusions and recommendations

The starting point for this paper has been the question with what means and measures vocational education and training has/ can contribute to decreasing the shortage of professional drivers in Europe. The previous chapters make a number of suggestions and recommendations what kind of contributions this could be such as:

- The strong and continuous orientation of initial and continuous vocational education and training for professional drivers on labour market/ industry needs in terms of training content as well as its organisational and methodological approach (chapter 4.1 and 5.1).
- The opening up and facilitation of career/education paths for professional drivers potentially supported by instruments such as qualifications frameworks or credit point systems as a way to make professional driving more attractive to youth and to keep experienced drivers and their expertise in the branch (chapter 4.2 and 5.2).
- The offering of training and guidance to employers on human resource development aspects such as recruitment and retention of employees with regard to professional drivers and management of labour turnover being especially challenging for the branch because it has to correspond to the needs of its high proportion of small and medium size enterprises (chapter 4.3).
- The need to further address health and safety topics especially in terms of a healthy lifestyle into professional drivers vocational education and training in order to support drivers to carry out this very demanding job also at older age (chapter 4.4).

One of these proposed contributions even addresses an aspect that is rated as crucial for the driver shortage in Europe by some major publications that deal with this issue: "Road drivers are not seen as reputable respectable occupation. The main reasons are the poor working conditions of road drivers in the sector such as long working hours and shifts, stress, poor wage and career prospects, long absence from home and only few possibilities to develop a private life." (Gijsberg et al., 2006, p.64) But the national examples as well as experiences from other sectors show that the establishment of such career/education pathways require the cooperation of different stakeholders especially of employers, professional drivers/ their representative bodies, vocational education and training providers and public/competent bodies as well as the application of a bottom up approach that strongly takes into consideration existing industry and education practice in the different countries in order to be successful and sustainable on the long run.

²² See also www.egf-support.eu for further information on proper application of the EQF learning outcomes approach but also the Dutch vocational systems applies a similar competence based approach that should be further considered in this context.

²³ See the country case studies developed within the ProfDRV project at www.project-profdrv.eu.

²⁴ An EQF-compatible profil and recommendations how to implement the driver CPC based on the EQFs learning outcome approach are developed in the course of the ProfDRV project.

This does equally apply to the development and implementation of education and training schemes for professional drivers as the Dutch example of directive 2003/59/ECs implementation into national practice shows. But also the other measures against the driver shortage suggested and described in this paper require a strong cooperation between the different stakeholders involved in order to address the shortage of professional drivers in a sustainable manner. The means of vocational education and training stakeholders are therefore rather limited but vocational education and training as a method can make a significant contribution to the overcoming of the professional driver shortage if applied in close cooperation by the different stakeholders.

With regard to the European driver shortage in general, the results of this study also reveal a deficit in terms of availability of empirical data with regard to the characteristics and causes of this shortage. While there are well elaborated and specific analysis' results for Australia and Canada available that go far beyond the level discussed in the study at hand and allow the introduction of very specific measures, such elaborated and systematic results are not available for Europe. Of course it can be assumed that the situations in Australia, Canada and Europe are comparable up to a certain level of detail and at a very general level as it has been applied within this study, but for further and more elaborated conclusions and recommendations, this data can only be used to a very limited extend.

The one study applying a European approach (see Samek Lodovici, 2009) is also a meta-study that considers the rare more or less systematic national studies on the driver shortage that are mainly coming from Western Europe. It draws conclusions from these results for all over Europe also at a rather general level. But it needs to be questioned if this is elaborated enough in order to effectively address the professional driver shortage at a European scale and with a European approach as appropriate for this occupation. At the same time such an approach should allow drawing specific conclusions for the different regions within Europe that seem to have different specifications being of special importance when talking about cross-border mobility of professional drivers. It is therefore strongly recommended to further elaborate the European professional driver shortage in far more detail and with a systematic approach in order to develop actions against the driver shortage that meet the needs of the European labour market.

List of references:

- American Trucking Association & Global Insight, Inc. (2005). *The U.S. Truck Driver Shortage: Analysis and Forecast*. available at: <http://www.truckline.com/StateIndustry/Documents/ATADriverShortageStudy05.pdf>, 15/03/2011
- Australian Trucking Association (2003). *Driving Australia's Future: A Report and Action Plan Addressing the Skills Needs of the Road Freight Transport Industry*. available at: <http://www.qta.com.au/pdf/DAF.pdf>, 15/03/2011
- BAG (2007). *Marktbeobachtung Güterverkehr: Sonderbericht über die aktuelle Fahrpersonalsituation im deutschen Güterkraftverkehrsgewerbe*. available at: http://www.bag.bund.de/cae/servlet/contentblob/9960/publicationFile/609/Sonderber_Fahrpersonal.pdf, 15/03/2011
- BAG (2011). *Marktbeobachtung Güterverkehr: Auswertung der Arbeitsbedingungen in Güterverkehr und Logistik 2011-I*. available at: http://www.bag.bund.de/SharedDocs/Downloads/DE/Marktbeobachtung/Sonderberichte/Sonderber_Arbeitsbed_Logistik_2.html?nn=12934, 10/10/2011
- Bakker, F. (2011). *SITA Vitality Programme*. available at: http://www.project-profdrv.eu/fileadmin/Dateien/Meetings/2nd_DordrechtNL/forum/SITA_Vitality_Program_FreekBakker.pdf, 30/05/2011
- Bauer, R. (2001). Fortbildungsordnungen erhöhen Attraktivität der Berufsausbildung: Wie sich Erfahrungen aus dem Kraftfahrzeuggewerbe für die IT-Branche nutzen lassen. *BWP*, 5/2001, 23-26
- Bergrath, J. (2011). Wunschenken: Viele Fahrer würden sich gern mehr um ihre Fitness kümmern *Fernfahrer*, 4/2011, 82-85
- Bergrath, J. (2011a). Fit for work: Viele Fahrer meinen, es gäbe unterwegs kaum Möglichkeiten, sich fit zu halten *Fernfahrer*, 5/2011, 86-88
- Bergrath, J. (2011b). Alles aus Zucker: Der Beruf des LKW-Fahrers ist bewegungsarm und stessbetont *Fernfahrer*, 6/2011, 86-88
- Bergrath, J. (2011c). MannschaftsSport: Gesunde Fahrer – um dieses Thema drehte sich alles bei den beiden Betriebsfeiern der Spedition Diebel. *Fernfahrer*, 11/2011, 86-87
- Bergrath, J. (2012). Mehr Wert am Steuer: Erst seit landesweit Tausende qualifizierte Fahrer fehlen, denkt die deutsche Transportbranche um. *Fernfahrer*, 1/2012, 28-30

- Canadian Trucking Human Resources Council (2003). *Profile of Driver Shortage, Turnover and Future Demand*. available at: <http://www.cthrc.com/en/store/products/profile-driver-shortage-turnover-and-future-expected-demand-printed-version-or-free-d>, 15/03/2011
- Dierks, R. (2011). *Measures that can be taken to avoid outflow of truck drivers...* available at: http://www.project-profdrv.eu/fileadmin/Dateien/Meetings/2nd_DordrechtNL/forum/TYA_Sweden_RobertDierks.pdf, 30/05/2011
- Eberhard, V., Scholz, S. & Ulrich, J.G. (2009). Image als Berufswahlkriterium: Bedeutung für Berufe mit Nachwuchsmangel. *BWP*, 3/2009, 9-13
- European Agency for Safety and Health at Work (2011). *OSH in figures: Occupational safety and health in the transport sector – An overview*. Luxembourg: Publication Office of the European Union
- Gijssbers, G., de Jong, J.M. & Gelderblom (2006). *Jobs and Competences in the Transport and Logistics Sector in the EU: Future Scenarios and Implications*. available at: http://www.uic.org/IMG/pdf/DG_EMPLOY_REPORT_PART_2_transport_16012009pdf_1_EN_1.pdf, 15/03/2011
- Houtman, I.L.D.; van den Bossche, E., Hesselink, J.K.; van den Berg, R. & van den Heuvel, F. (2004). *EU road freight transport sector: Work and employment conditions*. Dublin: European Foundation for the Improvement of Living and Working Conditions
- IAB (2011). *Berufe im Spiegel der Statistik*. available at: <http://bisds.infosys.iab.de/bisds/faces/Start.jsp>, 15/03/2011
- Klee, G.; Späth, J. & IAW (2008). *Kraftfahrer dringend gesucht: Wege aus der Personalkrise im Personen- und Güterverkehr*. available at: http://www.stuttgart.ihk24.de/linkableblob/979514/data/Studie_Fahrermangel-data.pdf, 15/03/2011
- Liebel, H.J. & Hofmann, M. (1998). *Berufskraftfahrer – Stiefkind des Verkehrswesens*. *ZfAW*, 4/98, 72-76
- Mannaerts, Y. (2007) *Conclusions from the 5th International IRU Academy Seminar on Driver Shortage*. available at: http://www.iru.org/en_aca_2007_highlights_mannaerts, 15/03/2011
- Manpower (2006). *Talent shortage survey results 2006*. available at: <http://www.manpower.com/research/>, 15/03/2011
- Manpower (2007). *Talent shortage survey results 2007*. available at: <http://www.manpower.com/research/>, 15/03/2011
- Manpower (2008). *Talent shortage survey results 2008*. available at: <http://www.manpower.com/research/>, 15/03/2011
- Manpower (2009). *Talent shortage survey results 2009*. available at: <http://www.manpower.com/research/>, 15/03/2011
- Manpower (2010). *Talent shortage survey results 2010*. available at: <http://www.manpower.com/research/>, 15/03/2011
- Menist, M. (2007). *Figures for Discussion ... Driver Employment, Migration of Drivers and Traffic Flows, Salaries, Public Perception, Driver Shortages*. available at: http://www.iru.org/en_aca_2007_highlights_Menist, 15/03/2011
- Mitraszewska, I., Nowacki, G. & Kaminski, T. (2008). *Professional driver's labour market in Poland according to directive 2003/59*. available at: http://www.tsi.lv/Research/Conference/RelStat_08/Proceedings/27.pdf, 15/03/2011
- Nolle, T. (2005). *Mobile Berufe – Eine Untersuchung der Arbeitsbedingungen und der Ernährung im Hinblick auf die Gesundheit*. available at: https://eldorado.tu-dortmund.de/bitstream/2003/21830/1/Mobile_Berufe_Dissertation_TanjaNolle.pdf, 15/03/2011
- NZQA (2011). *NZQF Levels*. available at: <http://www.nzqa.govt.nz/studying-in-new-zealand/nzqf/nzqf-levels>, 15/03/2011
- Oliver, R., Baas, P, Ludvigson, T. & Bolitho, H. (2003). *Driver Recruitment/ Retention in the Heavy Truck Transport Industry*. available at: <http://www.ternz.co.nz/Publications/Driver%20Recruitment%20Retention%20in%20the%20Heavy%20Truck%20Transport%20Industry%20%28Full%20Report%29.pdf>, 15/03/2011
- Samek Lodovici, M., Pastori, E., Corrias, C., Sitran, A., Tajani, C., Torchio, N. & Appetecchia, A. (2009). *Shortage of qualified personnel in road freight transport: A studied conducted for the European Parliament, Directorate General for Structural and Cohesion Policies*. available at: <http://www.europarl.europa.eu/activities/committees/studies/download.do?language=en&file=27901#search=%20shortage%20of%20qualified%20personnel>, 15/03/2011
- SAQA (2009). *National Certificate: Professional Driving*. available at: <http://allgs.saqa.org.za/showQualification.php?id=50285>, 15/03/2011
- SAQA (2011). *The National Qualifications Framework: An Overview*. available at: <http://www.saqa.org.za/show.asp?include=structure/nqf/overview01.html#7>, 15/03/2011
- Skills for Logistics (2007). *Survey of employers of HGV drivers (2006)*. available at: www.skillsforlogistics.org, 15/03/2011
- Skills for Logistics(2009). *Employer Forum: Driver CPC consultation*. available at: www.skillsforlogistics.org, 15/03/2011
- Skills for Logistics (2010). *The Professional Development Stairway*. available at: <http://www.thestairway.org/>, 15/03/2011
- Skills for Logistics (2005). *Modern Apprenticeship In Driving Goods Vehicles: Framework Document for Scotland*. Available at: <http://www.skillsforlogistics.org/home/qualifications/transport/dgv/>, 15/03/2011
- Tomasik, M.J. & Heckhausen, J. (2006). Sozialprestige von Ausbildungsberufen aus der Sicht von Realschüler-innen. *Zeitschrift für Sozialpsychologie*, 37 (4), 259-273
- TransqualITO (2011). *Road Transport Qualifications*. available at: <http://www.tranzqual.org.nz/qualifications/road-transport-qualifications/>, 15/03/2011