Employment in the EU transport sector
Contents

Preface.......................................................................................................................................1
1) Challenges in employment in transport........................................................................2
2) Policy and research on transport employment............................................................5
3) Creating employment opportunities in transport.........................................................8
4) Developing a skilled transport workforce......................................................................13
5) Improving working conditions in the transport sector................................................18
6) Policy and research outlook............................................................................................23

Bibliography ........................................................................................................................24

Glossary ....................................................................................................................................25

This publication was produced by the Transport Research and Innovation Portal (TRIP) consortium on behalf of the European Commission, Directorate-General for Mobility and Transport (DG MOVE). The brochure was compiled by Andreas Brenck and Timmo Janitzek (IGES Institut, Germany). The project team wishes to thank Professor Margaret Grieco for her valuable contribution, and Helen West for review of the manuscript.

LEGAL NOTICE: Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of the following information. The views expressed in this publication are the sole responsibility of the author and do not necessarily reflect the views of the European Commission.

Additional information on transport research programmes and related projects is available on the Transport Research and Innovation Portal website at www.transport-research.info.

doi: 10.2832/49571

© European Union, 2013
Reproduction of content other than photographs is authorised provided the source is acknowledged.

Cover: © fotolia_37977319.jpg
Copyrights photos:
page 1. © Deutsche Bahn AG
page 2. © Deutsche Bahn AG
page 4. © Fotolia/auremar
page 5. © CIVITAS/Pascaline Chombart
page 6. © Deutsche Bahn AG
page 8. © Deutsche Bahn AG
page 9. © Louis C Vest 2011, under Creative Commons Licence
page 10. © Images courtesy of the Highways Agency, under the Open Government Licence
page 11. © Deutsche Bahn AG
page 12. © Romain D C, under Creative Commons Licence

Printed in Bulgaria.
Preface

Transport and mobility are vital to Europe's internal market and essential to the quality of life of citizens in economic and social terms. As stated in the Transport White Paper, further market opening in transport needs to go hand-in-hand with quality jobs and working conditions because human resources are crucial to an efficient, high-quality transport system (EC, 2011a).

As a significant area of EU transport policy, employment has been included in the series of policy brochures produced by the Transport Research and Innovation Portal (TRIP). This brochure on employment in the transport sector presents an overview of EU policy and research to support policy development and implementation.

The policy brochures are an essential component of the comprehensive TRIP Portal that provides open access to the results and best practices of research programmes and projects in the European Research Area. A central theme of research policy under the Treaty of Lisbon, the European Research Area (ERA) has been identified to foster the free circulation of researchers, scientific knowledge, and technology.

TRIP Portal serves policy makers and research managers involved in all aspects of the transport sector. The Portal is developed and maintained by the TRIP Project Consortium and funded by the European Commission Directorate-General for Mobility and Transport (DG MOVE) under the Seventh Framework Programme for Research and Innovation.

All policy brochures are listed on the website and individual brochures can be downloaded from www.transport-research.info/web/publications/policy.cfm.
Introduction

Challenges in employment in transport

Competitive, reliable and efficient transport of people and goods is fundamental to employment, job creation, and economic growth in Europe. EU transport policy is directed to contributing to economic growth and job creation. Employment in the sector is now facing new challenges resulting from demographic changes in the European Union.

The transport industry employs more than ten million people, accounting for 4.5% of total employment in the EU, and representing 4.6% of gross domestic product (GDP). Manufacture of transport equipment provides an additional 1.5% of employment and 1.7% of GDP.

Of the ten million people employed in the transport sector, almost half are in road freight and passenger transport (see Figure 1). EU airports and airlines currently employ 670,000 people, while some 3.2 million people depend either directly or indirectly on the air sector for employment. Moreover, Europe has the world’s largest shipping fleet, providing employment for some 300,000 seafarers on merchant vessels and another three million in related jobs.

As in the EU economy as a whole, employment in the transport sector is facing economic and societal challenges, largely arising from demographic changes. The transport sector will need to address the challenge of a growing shortage of skilled workers in an increasingly competitive global environment. Retaining skilled workers and encouraging more and highly skilled people to join the workforce involves improving working conditions for all employees in the sector.

Changing demographics in Europe

For the first time in history, the vast majority of Europe’s citizens are able to lead healthy and active lives well into old age (EC, 2009b). The average life expectancy in the 27 EU Member States was 79 years in 2010, 75.3 years for men and 81.7 years for women. This is a rise of 2.7 and 2.3 years respectively within a decade. More than three-quarters of these 79 years of life can be expected to be free of activity limitation (OECD, 2012).

Europe’s ageing population becomes apparent in the workforce and particularly in the transport workforce, which is ageing at a faster rate than the general
Almost 30% of people employed in the transport sector are over 50, and will be retiring in the coming 10 to 15 years. In recent years, the transport sector has been less successful than many other sectors in recruiting younger workers, partly due to the sector’s negative image for employment (EESC, 2011).

Retention and recruitment of employees in the rail, road and maritime sectors are major issues in Europe. The European Commission estimated a shortage of 70,000 drivers of heavy road vehicles in 2009 (EU 27) and a shortage of 30,000 officers in maritime transport in 2008 (EP, 2009; Sulpice, 2011). Labour shortages are expected to become an increasing problem in the next 10 to 15 years as the economy and the transport sector return to growth and the number of people retiring from the sector increases. Thus, companies and policy makers are challenged with developing management strategies to overcome labour and skills shortages resulting from changing demographics in Europe.

Another challenge is to capitalise on the experience and motivation of older workers (over 55) and to retain them longer in the workforce. Strategies are needed to change attitudes and to ensure the employability of older workers through continuing skills development and through practical measures to maintain their health, employability and motivation. In this respect, more appropriate working conditions are required, such as more flexible work time and work organisation. Furthermore, obstacles to retaining older workers, such as mandatory retirement ages, need to be removed.

Migration could help mitigate the effect of an ageing workforce in the transport sector, but can also create additional problems. For instance, the movement of road freight drivers to alleviate labour shortages in some Member States may create shortages in other countries. These issues have to be considered in developing strategies to stimulate the movement of workers within the EU as well as immigration to mitigate labour shortages.

Low employment rates for women

Even though the number of women employed in the transport sector has increased in the last few
decades, the sector is still largely dominated by men. In 2011, women represented only 18% of EU 27 transport workforce but made up 45% of the total workforce in the EU. Employment rates range from 40% in air transport to 14% in land transport. Only 10% of bus drivers in Europe are women (ITF, 2011).

Policy and specific measures on equal opportunities can contribute to increasing the participation of women in the transport sector. A diverse workforce can bring additional benefits. For instance, women can contribute to meeting the requirements of women customers for transport services. However, key factors in raising the number of women in the transport workforce are improved job quality, working conditions and career opportunities.

Demand for new and advanced skills

While the transport sector offers a wide variety of jobs with different skills requirements, ongoing technological developments, and social and economic trends are exerting new pressures for highly skilled workers throughout the sector. As the driver's cabin of a high-speed train becomes increasingly similar to an aircraft cockpit, train drivers are required to have more advanced technical and analytical skills. Embracing low carbon technology requires new skills for the manufacture, installation, operation and maintenance of these advanced technologies (Jagger et al., 2012). With increasing cross-border transport, employees need skills in other languages and knowledge of international laws, regulations and environmental requirements. As the transport market becomes more open and thus more competitive, employees in contact with the travelling public have to develop social skills to provide the quality of service demanded by customers. With congestion and security challenges on the increase, transport employees are faced with new and difficult challenges for which they must be appropriately prepared.

Need to improve job quality and working conditions

A high proportion of jobs in the transport sector have traditionally been considered to be unattractive. Work schedules are often incompatible with family life, with long working hours and absences from home, and unpredictable shifts and overtime, particularly in door-to-door delivery. As research has shown, these conditions pose especially barriers to a further increase in women's participation in the workforce. Furthermore, the workplace and culture are still male dominated, and women are faced with difficulties, such as workplace ergonomics. For instance, driver seats and cabs are designed for men on the assumption that the design is also suitable for women (EU-OSHA, 2011).

Work pressure and workloads in the transport sector are increasing as a result of a combination of factors including intensified national and international competition, restructuring of public transport services, and business strategies such as 'just-in-time' delivery. According to a recent study for the European Parliament, stakeholders, such as trade unions and associations of transport companies, view current EU legislation as being substantially adequate to secure an appropriate level of social rights, but stress that enforcement mechanisms need further strengthening (TRT, 2013).

Work safety and employee wellbeing have increased in the last few decades, but further improvements in occupational health and safety are required, especially in maritime and road freight transport. Increasing security challenges in public transport are also reflected in gender differences, with women at higher risk than their male colleagues (EU-OSHA, 2011).
Policy and research on transport employment

Many transport companies in the EU are world leaders and provide employment for thousands of people. EU policies on transport and employment are directed to building a skilled workforce and to ensuring adequate working conditions for all employees in the age pyramid.

The transport sector is not unique in facing issues in developing a skilled workforce, by creating satisfying jobs, giving women access to professions and careers, and retaining older workers in productive employment while providing youth employment. These are broad objectives in EU policy on employment and on transport, and of a wide range of research initiatives.

"The human factor is a crucial component of any high quality transport system.

White Paper on Transport, accompanying commission staff working document, 2011

Retaining older workers

Boosting employment through more jobs and longer working lives of better quality was one of the five policy responses to managing demographic change identified in the EU Strategy The demographic future of Europe: from challenge to opportunity (EC, 2006a). The communication emphasised the need to increase the efficiency and equity of education systems to enhance skills, lifelong learning, and active ageing to increase workforce participation of men and women over the age of 55. Targets were defined to increase the employment rate of this group to over 50%, and to introduce a framework for a European initiative on lifelong learning.

The need to retain older workers was highlighted in the strategy Dealing with the impact of an ageing population in the EU by providing more job opportunities, especially part-time work and flexible working hours (EC, 2009b). The strategy also emphasised reforming disability and early retirement schemes, and raising effective retirement ages.

In line with EU employment policy, the challenges of labour shortages due to an ageing workforce are acknowledged in EU transport policy. In 2009, the communication A Sustainable Future for Transport underlined the need to ensure that an ageing population does not jeopardise Europe’s competitive position in the world economy and the capacity to maintain high living standards (EC, 2009a). The Transport White Paper stresses that human resources are crucial to a high quality transport system.
system, and the need to create quality jobs and working conditions (EC, 2011a).

With regard to alleviating labour shortages by means of immigration, the principles and actions for formulating a common European immigration policy have been prepared (EC, 2008a). In light of the Lisbon Strategy, promotion of economic immigration should be based on needs assessments in EU labour markets (EU, 2008).

Improving access for women

Gender equality and equal opportunities are emphasised in all EU treaties. The Lisbon Strategy for Growth and Employment targeted a 60% increase in the employment of women, and in the age group 20 to 64, their employment increased from 57.3 to 62.5% between 2000 and 2009 (EC, 2010b). The economic independence of women and the requirement to improve the quality of jobs and work-life balance are addressed in the Strategy for Equality between Women and Men 2010-2015 (EC, 2010b). Reconciling work and private life is taken up in the Europe 2020 Strategy for Smart, Inclusive and Sustainable Growth (EC, 2010a). Gender considerations and the need to facilitate women’s access to jobs are incorporated in EU transport policy (EC, 2009a).

Encouraging youth employment

The Communication Keep Europe moving emphasised motivating young people to enter the transport workforce in their own and in other Member States (EC, 2006b). More recently, the European Council Summit in 2013 stressed that combating youth unemployment is a major and immediate objective in the light of the unacceptably high number of young Europeans who are unemployed.

Building a skilled workforce

In 2006, the need for a better qualified workforce was incorporated in EU transport policy (EC, 2006b). Since then, policy and research priorities have led to the development of advanced training programmes, certification and certification methods for workers in the sector. An initiative to reinforce continuous development and upgrading of skills, known as New Skills for New Jobs, was part of the Europe 2020 strategy launched in 2008. Acquiring skills and competences throughout the working life requires comprehensive strategies for lifelong learning and particularly new approaches to adult learning (EC, 2010c).

The Transport White Paper underlines the necessity for action to develop new skills for quality jobs and the responsibility of social partners in this process with proposals for information exchange on skills needs and best training practices (EC, 2011a). Lifelong learning has been implemented in the road sector under Directive 2003/59/EC, which requires drivers of trucks, buses, coaches and minibuses to hold an initial qualification and to undergo periodic training. Continued certification is based on a requirement for 35 hours training in a five-year period. Lifelong learning, as part of modernising the profession of driver, is also
expected to stimulate the interest of young people and to contribute to the driver recruitment in times of shortages (Directive 2003/59/EC).

Improving working conditions

The Transport White Paper recognises that opening the transport market to competition needs to go hand-in-hand with quality jobs and improved working conditions (EC, 2011a). Furthermore, opening transport markets has highlighted the need to harmonise basic social standards to ensure adequate working conditions EU-wide, for instance legislation on minimum standards for working time and rest periods. Directive 2002/15/EC (working time) and Regulation 561/2006 (driving time) set common standards for average and maximum working time, breaks and night work as well as driver logbooks. Similarly, the Directive 2005/47/EC regulates work and rest periods in international rail transport. In 2012, the European Social Dialogue resulted in a working time agreement between the social partners in inland waterway transport. In 2013, the European Parliament supported the Commission’s proposal for a regulation setting new stricter rules regarding aircrew fatigue. Directed to clarify and improve the current regulations on flight and duty time limitations, the proposal contains some 30 provisions which will progressively become fully applicable throughout the EU. The provisions introduced include in-flight rest for cabin crew, and strict limits on night flights, standby and reserve.

Research in support of policy

Research related to transport employment is funded from various sources. Research funded under FP6 and FP7 covers a range of employment issues such as maintaining and upgrading skills in lifelong learning, occupational health and safety, and workplace adaptation to accommodate older employees.

Part of the European Lifelong Learning Programme, the Leonardo da Vinci programme for vocational education and training provides grants for the development and transfer of innovation by building synergies among training institutions, public authorities, industry, and small and medium-size enterprises. Since 2007, the da Vinci programme has supported research to develop innovative programmes and methods in vocational training, especially in road and rail transport.

An autonomous EU body, the European Foundation for the Improvement of Living and Working Conditions (Eurofound) supports policy formulation on social and work-related matters, and research on knowledge and skills requirements in all sectors, including transport and logistics. The European Agency for Safety and Health (EU-OSHA) prepares research priorities and research surveys, and supports research on working conditions in all transport modes. Hands-on instruments have been developed for use by micro, small and medium-size enterprises in assessing workplace risks, and sharing knowledge and best practices in health and safety.

The transport sector participates in the Knowledge and Innovation Communities (KICs) initiated by the European Institute of Innovation and Technology (EIT). The KICs are partnerships of higher education institutions, research organisations, companies and other stakeholders. Collaboration is directed to setting up innovation projects, marketing new ideas and products, and creating training opportunities to strengthen the workforce to meet future demands.

Source: EC, 2010a
Appropriate management of the age pyramid of human capital is needed to prevent skill shortages in critical areas. The EU and various Member States have developed concepts, programmes and guidelines, and have undertaken research to identify strategies and best practices to integrate older people into the workforce, and to attract more women and young professionals.

Older workers

In support of policy on extending the productive employment of older workers, such as the communication *A Sustainable Future for Transport* (EC, 2009a), research has identified a range of measures to retain and re-integrate (re-entry) them in the workforce. Measures include job re-structuring and flexible working arrangements, as well as targeted health promotion and age-oriented personal development and continuous training.

Research underlines the importance of lifelong learning and training to ensure the productivity of the workforce. As a result, strategies have been developed to support older workers to update their skills and knowledge to meet the continuous technological developments in the transport sector. Research has identified best practices, such as motivating older workers by demonstrating the benefits of continuous learning and by offering learning opportunities. Learning content needs to be task-centred and related to previous experience, while avoiding competitive situations that may discourage learning new skills. These concepts and approaches have been shared by partner organisations including sector employers, trade unions, and education and training organisations.

Studies on working conditions have identified specific requirements of older workers and developed measures to meet these needs. For instance, older transport workers are increasingly likely to suffer
from the consequences of long-term exposure to risks of chronic musculoskeletal system disorders, and to noise or vibration related diseases (EU-OSHA, 2011). Reducing these potential risks may require adaptations to the workplace. Research has led to technological solutions, such as floor panels to reduce noise in truck driver cabins, seats with air suspension to reduce whole-body vibration, automatic gears, and power-assisted steering for buses. Risk assessment methods have been developed to identify working conditions unfavourable for older workers, such as workplace noise and vibration. Recommendations have been prepared for implementation of improvements as well as for train-the-trainer programmes and manuals on preventive actions.

Furthermore, work patterns and shifts have been shown to have greater impact on older than on younger workers, and that unfavourable work schedules are often a contributing factor to older workers leaving the transport workforce. Research projects have developed more flexible working time arrangements (individual working schedules) and part-time retirement arrangements, for instance for bus drivers, that take account of employee age, physical ability, life circumstances and professional achievements.

**Women in transport**

In support of EU policies on increasing women’s participation in the workforce and on equal opportunities, research funded under FP7 ranges from identifying barriers, toolkits to build gender capacity, to policies to promote employment of women in the transport sector.

An EU-funded study on the employment of women in public transport (see Success Story) and other EU-wide and national studies have identified numerous barriers to their employment. In the rail sector, these barriers were identified as employer reluctance to hire women, and less favourable working conditions in terms of wages, access to training, and working hours unfavourable to family life. Other factors included male-centred ergonomic working conditions, risk of violence and harassment, and cultural stereotypes (Austrian Institute for SME Research, 2011). Another
study conducted by EU-OSHA (2011) identified other barriers including lack of awareness of women’s issues and rights.

Research on employment equality has shown that overcoming these barriers not only benefits women but also improves working conditions for all in the transport sector (Scullen, 2008). For instance, more responsive planning of work schedules, and more transparency in promotion decisions benefit all employees.

Toolkits to build gender capacity in the rail sector include best practices, such as equal opportunity plans and their organisational implementation; training for women to develop skills in dealing with potential conflict situations with the public; and initiatives to break gender stereotypes in order to combat discrimination and sexual harassment (Austrian Institute for SME Research, 2011). Gender capacity building is often targeted in executive training modules, workshops and in special projects.

However, best practices to break down barriers to women employment in the transport sector still have to be implemented more widely. An EU-funded study, for instance, has shown that most companies in the railway sector are not legally required to report on gender equality and that less than half of the companies include these issues in their corporate social dialogue (Austrian Institute for SME Research, 2011).

Young professionals

Various measures have been developed and tested to increase understanding and interest of young people in employment in different transport modes. These activities have involved schools and especially universities in attracting young professionals with advanced skills.

Research funded under FP6 and FP7 to attract young people includes innovative ways of engendering a modern image of the transport sector. To increase awareness of the job and career opportunities, studies have been carried out in aeronautics and air transport (EDUCAIR), in the railways sector (FUTURAIL) and on careers in marine research (PROMARC). These studies analysed job opportunities, and education and training requirements, and considered awareness raising campaigns.

Effective strategies have been explored in presenting job opportunities in vehicle electrification to high school students, such as road shows, competitions, and summer schools. Maritime transport technologies have been presented in schools, and ‘school labs’ have been set up in maritime research institutes. Academic competitions, thematic workshops and summer schools have been organised to attract graduates to research careers. Informal discussion groups, known as TECH CLINICS, have been effective in encouraging young people to join the transport sector (TECH-CLINIC SST).

In addition, initiatives in sectoral social dialogue have been identified and best practices communicated. For instance, rail companies have introduced school cooperation programmes and young specialist appointment programmes (EVA, 2011).
In EU urban public transport, women account for only 17.5% of the workforce and hold less than 10% of technical and operational jobs. The main reasons for the under-representation of women in urban public transport were identified and guidelines produced for a more conducive work environment, with recommendations focusing on training and recruitment opportunities.

BACKGROUND

The two-year WISE project was part of the Work Programme of the European Social Dialogue and was funded under FP7. The project was a collaboration of the International Association of Public Transport (UITP) and the European Transport Workers’ Federation (ETF) and brought together public transport stakeholders in EU Member States. In line with the EU goal of 75% employment by 2020 with greater participation of women in the labour market, the WISE project assessed the situation in urban public transport. As well as surveys and interviews, meetings were held to share best practices in five cities – Antwerp, Berlin, Bucharest, Helsinki, and Sofia.

RESULTS

Data from 14 EU Member States revealed that public transport companies, trade unions and associations are aware of the benefits of employing women and have tried in various
ways to increase the proportion of women employees. However on average, women make up only 17.5% of the public transport workforce, and less than 10% of technical and operational jobs, such as drivers. Gender diversity is slightly better in managerial positions (23.8 %) but with fewer women in higher positions, including boards of directors.

The main barriers to women were identified as lack of corporate initiatives to improve the work-life balance for employees, a male working culture and gender stereotypes. For instance, the small percentage of women in technical jobs was attributed to lack of interest and skills on their part. As shown in Chapter 3, this generally accepted stereotype may be an obstacle to women’s employment not only in urban public transport but also to other technical jobs (Austrian Institute for SME Research, 2011).

As well as presenting the state-of-the-art on women in urban public transport in Europe, the project produced guidelines for a more friendly work environment for women. Advice was offered on promoting the role of women in transport jobs, focusing on training and recruitment opportunities and procedures. As follow-up to the WISE project, UITP and ETF have recommended using the project results to initiate broader and in-depth debates with European transport companies, their associations and trade unions.
Developing a skilled transport workforce

The efficiency of the transport sector depends on a workforce of qualified people who are actively engaged in lifelong learning. Building the skills and competences for the continuing development of the sector requires closer alignment with research and training institutions.

The EU strategy on empowering people through lifelong learning is presented in the Agenda for new skills and jobs, the Strategic framework for European cooperation in education and training of the Council of the European Union, and implemented through transport directives, initiatives and programmes. Furthermore, Europe 2020: a strategy for smart, sustainable and inclusive growth and Europe 2020 Flagship Initiative Innovation Union call for closer cooperation of universities, research and business in matching knowledge and skills training with human resources requirements. In this framework, research programmes play a major role in developing methods and curricula for lifelong learning and establishing sustainable networks of higher education, research and industry.

Training and lifelong learning

Research supports strategies for training and lifelong learning. Research under FP6 and FP7, for example, has contributed to the development and dissemination of training programmes and methods for truck and bus drivers. Computer-based training modules on road safety have been developed with dissemination plans for Austria, Poland, Spain and Germany (ERIC). A training centre for heavy vehicle drivers equipped with a state-of-the-art driving simulator has been set up in Portugal (MODERN). Training needs for workers in urban public transport and best practices have been identified with a focus on the customer perspective.

"Skills on new technologies, on sustainable ways of transport, or on customer care cannot be taken for granted. Education and training is essential."

White Paper on Transport, accompanying commission staff working document, 2011
Training and lifelong learning are underlined in European Social Dialogue initiatives for transport modes. Initiatives are backed by research under FP6 and FP7 that has identified competence requirements and developed training courses and methods. For instance, training needs have been identified for personnel in air transport and aeronautics (EDUCAIR). Europe-wide computer-based training on safety issues has been developed for train drivers (2TRAIN). Recommendations have been made for EU-wide harmonisation of training and qualifications for employees in freight transport and logistics (POSMETRANS).

For instance, bus drivers are trained in customer relations and information, service-oriented use of the technical equipment, and assistance to disabled persons (PROCEED).

Innovative training programmes for the transport sector have been developed under the Leonardo da Vinci programme. For instance, a Web 2.0 learning environment has been initiated on health and safety for road freight drivers to increase risk awareness. Other programmes and skills training methods include safety awareness for public transport drivers, simulator-based training for train drivers, stress prevention for road drivers, and train-the-trainer methods for road transport. Activities are also directed to the training and education of older workers.

Research under the Leonardo da Vinci programme has contributed to the development of certification for jobs in logistics and road freight, and for train drivers. The process is based on the European Credit System for Vocational Education and Training directed to making training programmes and certification more compatible across Europe. For instance, the Freight Transport Logistics Action Plan states that voluntary European certification can contribute to the consistency and quality of training in Europe, and facilitate worker mobility (EC, 2007a).

STRATEGIC OBJECTIVES FOR EUROPEAN COOPERATION IN EDUCATION AND TRAINING

- Making lifelong learning and mobility a reality;
- Improving the quality and efficiency of education and training;
- Promoting equity, social cohesion and active citizenship;
- Enhancing creativity and innovation, including entrepreneurship, at all levels of education and training.

Source: Council of the European Union, 2009
**Closer cooperation of education, research and industry**

The closer link of universities, research and industry called for in *Europe 2020* are directed to greater involvement of industry in university training programmes in order to match skills training more closely with industry needs. This strategy is being implemented through initiatives such as the European Institute of Innovation and Technology (EIT) and sector-specific initiatives.

EIT initiates long-term, self-supporting networks of higher education institutions, research organisations, companies and other stakeholders known as Knowledge and Innovation Communities (KICs). As well as transforming innovative ideas into new products, services and jobs, these networks offer training opportunities including MSc programmes and PhD summer schools, practice programmes, and cooperative innovation projects. Training programmes for students and professionals combine science and entrepreneurship with emphasis on learning-by-doing in innovation projects run within the KICs.

The transport sector is currently participating in two KICs: Information and Communications Technology (EIT ICT Labs) and Climate Knowledge and Innovation. ICT Labs focuses on intelligent mobility and transport systems, including improving networking between transport modes through integrated solutions for trip planning and real-time access to information. One of the key themes of the Climate KIC is sustainable cities, focusing on integrated utilities and mobility with the development of sustainable transport systems and infrastructure, such as ports and airports.

Interaction of universities, research organisations and industry has been fostered through research projects, workshops and joint programmes initiated by the European Commission and social partners. For instance, gaps between skills needs and university curricula have been analysed, and consultation processes between the marine industry and universities proposed developing joint training programmes (CAREMAR). A strategic research agenda and a strategy for harmonising education standards have been prepared for inland waterway transport (PLATINA). Networks have been set up, such as the Virtual European Railway University (see Success Story), the European Network of Aeronautical School Labs and the European network, Education in Inland Navigation (EDINNA). These networks provide platforms for knowledge exchange and stimulate a coordinated approach to the development of curricula and training programmes.
SKILLRAIL launched EURAIL, the virtual European University of the Railway, on 20 October 2011 to foster a closer match between human resources requirements and skills training. In making railways more competitive and innovative, EURAIL is developing a European training and education system for the railway community of tomorrow.

BACKGROUND

Funded under FP7, the SKILLRAIL project was set up to match the demand for and supply of the skills and competencies in the rail sector, thus creating more job opportunities and faster incorporation of young talent in the sector. Stakeholder requirements for skilled personnel were assessed, including railway operators, infrastructure managers, rolling stock companies, transport authorities, and rail research institutions. Current training and education programmes in universities and higher education institutions in Europe and outside Europe (China, India, Russia, South Africa, South Korea and USA) were analysed.

RESULTS

The SKILLRAIL project identified the key areas in skills development for the future as multimodal and combined transport, new technologies in rolling stock, asset management, development and use of Quality...
Management Systems, energy efficiency, and international signalling principles to maintain and improve railway safety and performance.

To meet future requirements, SKILLRAIL is setting up a virtual European University of the Railway (EURAIL) to address the training needs of the sector. Based on the knowledge, experience and people in universities in Europe, EURAIL is fostering European excellence and a network of relevant organisations and institutions in education projects. With the EURAIL University and the first training programmes with UIC (SKILLRAIL, 2011), SKILLRAIL is working towards concentrating high-level knowledge and expertise in a single sector, problem-oriented institution.

EURAIL is a platform for storing and comparing training requirements and opportunities in order to connect training networks in a unique and centralised system, allowing local application but not fragmentation.
Improving working conditions in the transport sector

Adequate working conditions are vital in attracting and retaining a highly skilled workforce to build, operate and maintain a modern and efficient transport system. Various EU policies and research initiatives are dedicated to improving occupational health and safety, and to securing basic social standards throughout the EU.

Transport is seen as one of the least favourable sectors with regard to working conditions (Eurofound, 2012). Furthermore, a comprehensive strategy to promote health and safety at work in the European Union highlighted the need to improve employee safety in the transport sector (EC, 2007b). Thus, improving working conditions for all transport employees is a key priority in the Transport White Paper, which has proposed an evaluation of the EU approach to jobs and working conditions (EC, 2011a). In addition, opening transport markets in Europe has significantly increased competitive pressure on operators and their workers. While stakeholders view current EU legislation as being adequate to secure an appropriate level of social rights, they stress that enforcement mechanisms need further strengthening (TRT, 2013).

“Market opening needs to go hand-in-hand with quality jobs and working conditions ...”
White Paper on Transport, accompanying commission staff working document, 2011a
Social standards

The opening of transport markets has been accompanied by EU Directives to secure basic social standards and to prevent distorted competition. However, analysis of EU Directives on working conditions and implementation of regulations has shown that conditions vary considerably between transport modes for different reasons. For instance, remuneration varies between aviation and maritime transport and within the same mode, such as between flight crews and ground handling personnel (Ecorys, 2007; Sulpice, 2011). Trends have also been identified towards more flexible contracts and variable wage components, and towards increasing operational pressure, for instance, tighter deadlines and working at greater speed (Ecorys, 2007).

Studies on harmonising enforcement of social standards in road freight and bus transport have led to recommendations to clarify the provisions of regulations. Proposals for more effective enforcement include targeted enforcement (more frequent controls for high offenders), more information exchange between Member States, extension of joint liability regulations and harmonisation of sanctions, and introduction of reporting mechanisms on the application of Directives (Steer Davies Gleave, 2009; High Level Group, 2012).

Occupational health and safety

Health and safety at work are well developed aspects of EU policy on employment and social affairs. A large body of EU legislation has led to improved working conditions for employees in transport and other sectors, and has contributed to reducing the incidence of work-related accidents and illnesses (EU-OSHA, 2011). However, a comprehensive strategy to further promote health and safety at work in the European Union in the period 2007 to 2012 identified transport as lagging behind in employee safety (EC, 2007b). Further studies have shown that recent changes in work organisation and increasing demand for transport services have had considerable impact on occupational health and safety, with employees working longer hours, under non-standard conditions, and exposed to multiple risks.

Research under FP6 and FP7 has identified and developed effective solutions for specific occupational health and safety issues in the transport sector. Many studies were carried out in close cooperation with partners in the industry including vehicle manufacturers. For instance, new designs have been developed for driver cabins and seats to reduce the risk of musculoskeletal disorders especially for women and older drivers. Improvements have been made to the design of the human-machine interface...
to minimise driver workload and distraction. Measures have been developed to reduce exposure to emissions, such as noise in driver cabins, and during loading and unloading.

Improvements in working conditions include truck parking areas, a particularly sensitive issue for drivers. EU-funded research identified best practices, designed parking areas, constructed five pilot sites, and introduced a quality certification scheme for these areas. A recent study states that EU-funded projects (SETPOS and LABEL) are major steps forward in improving the quality of parking areas in Europe (TRT, 2013). This service will guide drivers to find the next suitable parking, lowering stress and raising safety and security. These research projects paved the way to a European regulation on the provision of information services for safe and secure parking for trucks and commercial vehicles. Another development is a management toolkit to reduce the risk of fatigue in ship watchkeeping by optimising work schedules and alarm systems (see Success Story).

### INITIATIVES TO PROMOTE QUALITY JOBS AND WORKING CONDITIONS

- **Social code for mobile road transport workers**
  Encourage and support the dialogue between social partners in view of an agreement on a social code for mobile road transport workers, addressing also the problem of disguised self-employment.

- **Social Agenda for maritime transport**

- **Socially responsible aviation sector**
  Establish a mechanism to analyse the impact of regulatory developments on working conditions and Europe-wide minimum service and quality standards for workers in the aviation value chain.

*Source: EC, 2011a*
Increasing complexity of ship systems and on board equipment places greater emphasis on the performance of seafarers and particularly watchkeepers. Marine insurance statistics have shown human error to contribute to 60% of accidents, while other studies suggest the figure is as high as 80 to 90% for collisions and groundings (HORIZON, 2011). The increasing intensity of shipping operations means that seafarers frequently work long and irregular hours, while the quality of sleep during rest periods is affected by factors such as noise, vibration, sailing patterns, port calls and cargo handling. The FP7 project, HORIZON, responded to growing concern about watchkeeper fatigue and sleepiness in maritime accidents with the aim of increasing safety and security, and reducing fatalities.

In this European study, eleven research and shipping organisations collected empirical data on watchkeeping patterns and the effects of sleep deprivation on ship watchkeepers. 

HORIZON delivered a fatigue management toolkit including recommendations and an alertness model to identify critical fatigue points for ship watchkeepers, thus enabling mitigating action to be planned. The model known as MARTHA is based on empirical data on watchkeeping patterns and the effects of sleep deprivation on ship watchkeepers.
were used in assessing decision-making and cognitive performance of watchkeepers in real-time scenarios of voyage, workload and interruptions. The performance and sleepiness of experienced deck and engineer officers were measured during seagoing and port-based operations on the bridge, and in engine room and in liquid cargo handling simulators.

RESULTS

Data from HORIZON indicates that the probability of danger at sea is highest when night watches are combined with reduced sleep opportunities prior to the watch and challenging conditions such as narrow or densely trafficked waters or reduced visibility. Reaction times were found to be lowest towards the end of the night watch (00:00-04:00), closely followed by the 04:00-08:00 watch. Significant differences were also found between the two watch systems, 4-on/8-off and 6-on/6-off, with sleepiness higher on all watches in the 6-on/6-off system. Evidence indicated that routine and procedural tasks tended to be carried out with little or no degradation, but responses in novel incidents such as collision avoidance or technical failures were most affected.

The project partners developed a fatigue management toolkit to provide guidance to owners, operators, maritime regulators and seafarers in organising safer and healthier work patterns at sea. MARTHA is a prototype for a fatigue prediction model to estimate fatigue during watchkeeping patterns under realistic conditions, such as the number and duration of passages through narrow or very densely navigated waters. Due to the detailed and realistic modelling approach, MARTHA is set to empower ship managers to optimise work schedules.
EU policy recognises that employment in the transport sector now takes place within the demographic context of an ageing society with increasing pressures for longer working lives. In the transport sector, the speed of and the need for technological changes require the development of lifelong learning, not the least in respect of continuous updating of e-skills and cultural competences. Longer working lives are also likely to necessitate improvement in working conditions in the European transport sector. Improved working conditions across Europe would not only contribute to achieving social policy targets but would also attract a higher calibre workforce better positioned to modernise and to embrace the modernisation of this sector.

Europe-wide research projects, programmes, policy research and networks have a key part to play in the establishment of lifelong learning, and improvement of working conditions and recruitment outcomes.

Research is needed on how information technologies can be utilised in improving the working conditions of the transport workforce. New information technologies can be directly applied to resolve problems of personal security – a major concern in the transport sector. This is also an important consideration in increasing the intake of women in the transport sector. In addition, automation still has to be considered as a way to improve working conditions. But, automation and also information technologies can have detrimental effects on employment, an aspect for future research.

The initiatives of the European Commission have resulted in content (lifelong learning programmes) and structures (networks and social sectoral dialogue). However, use of lifelong learning arrangements and of policies on gender equity, and compliance with social standards can still be improved. Research on implementation barriers and ways to overcome them is strongly needed.
Bibliography

- European Economic and Social Committee (2011): Opinion of the European Economic and Social Committee on How EU policies have impacted on the job opportunities, the training needs and the working conditions of transport workers, TEN/445 – CESE 1006/2011, Brussels.
## Glossary

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2TRAIN</td>
<td>Training of train drivers in safety relevant issues with validated and integrated computer-based technology</td>
</tr>
<tr>
<td>CAREMAR</td>
<td>Coordinated academic RTD and education supporting innovation in marine industries</td>
</tr>
<tr>
<td>DG MOVE</td>
<td>Directorate General for Mobility and Transport</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>EDINNA</td>
<td>Education in Inland Navigation</td>
</tr>
<tr>
<td>EDUCAIR</td>
<td>Assessing the educational gaps in aeronautics and air transport</td>
</tr>
<tr>
<td>EESC</td>
<td>European Economic and Social Committee</td>
</tr>
<tr>
<td>EIT</td>
<td>European Institute of Innovation and Technology</td>
</tr>
<tr>
<td>EP</td>
<td>European Parliament</td>
</tr>
<tr>
<td>ERA</td>
<td>European Research Area</td>
</tr>
<tr>
<td>ERIC</td>
<td>Experiencing CBT programmes in road safety in the European Community</td>
</tr>
<tr>
<td>ETF</td>
<td>European Transport Workers’ Federation</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EU-OSHA</td>
<td>European Agency for Safety and Health at Work</td>
</tr>
<tr>
<td>EURAIL</td>
<td>European University of the Railway</td>
</tr>
<tr>
<td>Eurofound</td>
<td>European Foundation for the Improvement of Living and Working Conditions</td>
</tr>
<tr>
<td>EVA</td>
<td>European Academy for Environmentally Friendly Transport GmbH</td>
</tr>
<tr>
<td>FUTURAIL</td>
<td>Job opportunities for the railway community of tomorrow</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>HORIZON</td>
<td>Research into effects on cognitive performance of maritime watchkeepers under different watch patterns, workloads &amp; conditions</td>
</tr>
<tr>
<td>ITF</td>
<td>International Transport Forum</td>
</tr>
<tr>
<td>KIC</td>
<td>Knowledge and Innovation Communities</td>
</tr>
<tr>
<td>LABEL</td>
<td>Creating a label for (secured) truck parking areas along the Trans-European Road Network and defining a certification process. Including online information facility</td>
</tr>
<tr>
<td>MODERN</td>
<td>Mobility, development and energy use reduction</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>PLATINA</td>
<td>Platform for the implementation of NAIADES</td>
</tr>
<tr>
<td>POSMETRANS</td>
<td>Policy measures for innovation in transport sector with special focus on small and medium-size Enterprises</td>
</tr>
<tr>
<td>PROCEED</td>
<td>Principles of successful high quality public transport operation and development</td>
</tr>
<tr>
<td>PROMARC</td>
<td>Promoting marine research careers</td>
</tr>
<tr>
<td>SETPOS</td>
<td>Secure European truck parking operational services</td>
</tr>
<tr>
<td>SKILLRAIL</td>
<td>Training and education for a more competitive and innovative railway sector</td>
</tr>
<tr>
<td>SME</td>
<td>Small and Medium Enterprises</td>
</tr>
<tr>
<td>TECH-CLINIC</td>
<td>Setting up effective Technological Clinics to address real knowledge needs of surface transport industry</td>
</tr>
<tr>
<td>SST</td>
<td></td>
</tr>
<tr>
<td>TRIP</td>
<td>Transport Research and Innovation Portal</td>
</tr>
<tr>
<td>UIC</td>
<td>International Union of Railways</td>
</tr>
<tr>
<td>UITP</td>
<td>International Association of Public Transport</td>
</tr>
<tr>
<td>WISE</td>
<td>Women Employment in Urban Public Transport Sector</td>
</tr>
</tbody>
</table>
The transport sector accounts for 4.5% of total workforce in the European Union and represents 4.6% of gross domestic product (GDP). As in the economy as a whole, employment in the transport sector is facing economic and societal challenges of a growing shortage of skilled workers in an increasingly competitive global environment. This policy brochure produced by the Transport Research and Innovation Portal (TRIP) presents EU policy on transport employment and highlights the contribution of research in supporting policy development and implementation in meeting the challenges of retaining skilled workers and encouraging more and highly skilled people to join the transport workforce.