



# Preventing Road Accidents for the Safety of Employees

Thematic Reports 1-6  
Factsheets 1-6

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# “PRAISE”: Preventing Road Accidents and Injuries for the Safety of Employees

Praising Best Practice in Road Safety ‘At’ Work and ‘To’ Work  
*“Mobilising knowledge to create work-related road safety leadership”*

## Objectives:

-Advance the need for work-related Road Safety Management and provide the know-how to employers who have to take on that challenge.

-Discuss and expose the work-related road safety standards of EU Member States and carry out advocacy work at the EU level: work-related road safety is an area of road safety policy that clearly needs renewed political commitment.

-Communicate the message that work-related road safety should include road safety ‘at’ work (driving on duty) but also road safety ‘to’ work (commuting).

## Background: work-related road crashes... a rising concern

Using the roads is a necessary part of everyone’s daily business, often for work-related purposes. **It is therefore unacceptable that an ordinary activity leads to an incredibly high level of injury and death.**

Work-related crashes involve heavy goods vehicles and buses, but also cars and light vans. It must be considered that the service sector often emphasises the importance of travelling to meet clients on site and face-to-face.

This is defined ‘**mobile working**’, where the car becomes a de facto office for employees. **Employers have a responsibility to provide their employees with a safe environment also on the roads.**

ETSC has launched **PRAISE**, a 3 year project addressing all safety aspects of driving ‘at’ work and driving ‘to’ work, that aims to “**praise**” best practices in order to help employers secure high road safety standards for their employees.

*“In Europe six out of ten work accidents resulting in death are road crashes, including both crashes while driving for work and commuting crashes.” (Eurogip)*



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## What are the benefits?

-Reduced running costs through better driving standards (fuel consumption/vehicle maintenance costs);

-Making informed decisions about matters such as driver training and vehicle purchase;

-Fewer working days lost due to injury;

-Reduced risk of work-related ill health;

-Reduced stress and improved morale;

-Less need for investigation and paperwork;

-Less lost time due to work rescheduling;

-Fewer vehicles off the road for repair;

-Fewer missed orders and business opportunities reduced risk of losing the goodwill of customers;

-Less chance of key employees being banned from driving;

-Promoting sound health and safety driving practices may well spill over into private driving.

*“It is estimated that 40% of all road crashes involve people ‘on duty’ and people driving to work or returning from work.” (ORSA)*



## How does PRAISE work? What are the Deliverables?

### Deliverable:

- 9 PRAISE Thematic Reports (8/10 pages)

- **Thematic Reports:** documents prepared by ETSC and its experts. For every thematic report ETSC will organise one expert meeting in Brussels with 3 road safety experts in the theme covered.

-**In-vehicle safety equipment;**

-**Initial and continuous driver training;**

-**Working on the roads, EU regulations;**

-**Transportation of dangerous goods;**

-**The 'Moving Office';**

-**Speed Management;**

-**Intelligent Commuting;**

-**Developing road safety management programmes**

-**Auditing road safety**

### Deliverable:

- 9 Fact Sheets presenting employer's 'Success Stories'

### Deliverable:

- 3 PRAISE Brunches and Awards

ETSC will organise once a year, a high-level and highly visible event:

-the **'PRAISE Brunches'**: an informal Brunch with decision makers and employers engaged in work related road safety. This will be a means to launch the Thematic Reports publicly

-the **PRAISE Award**, handed during the PRAISE Brunch to one employer identified for taking on the road safety challenge responsibly.

### Deliverable:

- 6 PRAISE Country Seminars

Every 6 months ETSC will organise:

One **Country Seminar** focusing on one EU member state and its road safety standard.

There will also be:

- Key road safety professionals;
- National decision-makers.

There will be a seminar in 6 countries so divided:

- 2 countries with high standards in work related road safety (the UK and Sweden);
- 2 countries that are 'medium range' (France and Germany);
- 2 countries that need to improve standards in occupational road safety (Poland and Greece).

### Deliverable:

- 1 PRAISE Handbook on Work Related Road Safety Management

The PRAISE Handbook entitled "Road Safety 'at' work and 'to' work-a Handbook". This Handbook will bring together all 9 thematic reports.

Moreover during the three years, ETSC will use the knowledge gathered in PRAISE to undertake **advocacy** activities at the European level aiming to integrate road safety into the EU's Occupational Health and Safety legislation.

# “PRAISE”: Preventing Road Accidents and Injuries for the Safety of Employees

## How can In-vehicle Safety Equipment improve road safety at work?

- Seat Belt Reminders
- ISA
- ACC
- Alcolock
- ESC
- EDR
- Following distance warning
- Emergency Braking
- Route Planning
- Fatigue Detector



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## ETSC PRAISE Project

PRAISE is a new project run by ETSC on Preventing Road Accidents and Injuries for the Safety of Employees ([www.etsc.eu/PRAISE.php](http://www.etsc.eu/PRAISE.php)). The project aims to advance work-related Road Safety Management and provide the know-how to employers who have to take on that challenge. This first thematic report aims to present how in-vehicle safety equipment can improve and manage work related road safety. This report addresses all employers managing all types of vehicle from public authorities, vehicle leasing suppliers, small two car delivery companies to large international companies and also vehicle manufacturers.

### Road Safety in the work context: identifying the problem and introducing in-vehicle technology

The scope of the problem varies from one organisation to another, the starting point for any employer should therefore always be to undertake a risk assessment and draw up a road safety action plan, based on priorities identified in the assessment and as part of occupational health responsibilities (a European Directive<sup>1</sup> requires every employer in Europe to undertake a risk assessment). This action plan can include in-vehicle safety features and equipment as part of the solution as judged appropriate. The preferred safety equipment to be fitted in vehicles should be identified according to the particular risks. To do that you need to know both the nature and size of the risks:

- The nature of the risks: all risk factors that lead to collisions should be listed. Excessive speed, drink driving and not wearing seat belts are the traffic offences that research suggests most often contribute to traffic injuries and deaths. However, you should also consider more specific risk factors related to the organisation. Organisations supplying and operating fleet vehicles most often find that

they face particular risks related to their type of vehicles: for example large goods vehicles rollover at lower speeds than other motorised vehicles because of their height, and most large vehicles have visibility problems when reversing and blind spot problems. Finally, do not forget that drivers are human beings with limited abilities and skills, and biological constraints. Fatigue for example is a very common risk factor in road business, and one that is too often overlooked by organisations asking their people to travel for work purposes.

- The size of the risks: for each type of collision caused by those factors you should know the related amount of asset damage, number of injuries and deaths, and quantify the resulting costs, including material damages, to the organisation. Depending on the size and capacity of the organisation you will have different means to gather such data. The different ways of assessing the size of the risk range from simply asking employees how often particular incidents occur, to analysing collision/incident records or even fitting vehicles with event data recorders and analysing the resulting information. As a general rule, what gets measured gets improved! For organisations running fleet vehicles, an easy source of data on vehicle damage can be their insurance, insurance broker, accident management supplier, and/or vehicle leasing company.

Once the employer has identified the nature and size of the risk faced, they will be able to assess their priorities and make the relevant cost tradeoffs and business case. Fitting safety equipment or purchasing vehicles fitted with particular safety features and equipment can be an effective way of reducing the risks. However you should always explain the reason for it to employees (a good safety culture should always be shared with all employees instead of seen only as something imposed by the management), but also very importantly you should train employees on how to use that equipment properly. Fitting vehicles with particular safety equipment is just one part of a greater sequence of actions; it is never the only thing that you have to do.

<sup>1</sup> Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work.

## The Business Case

Duty of care and health and safety compliance are legal necessities in most EU Member States, and an essential consideration for employers. Employers should also make sure that their employees are able to comply with the law for example making sure there are seat belts on all seats. But equally important, it most often makes sound business sense to draw up and implement a road safety action plan. For businesses there is a clear link between safety, quality, customer service, efficiency and the environment. Road safety has a massive impact on society, and for this reason can play a major role in improving – or damaging an organisation’s corporate social responsibility (CSR). This can be reflected in different ways:

- Reduced running costs through better driving standards (fuel consumption/vehicle maintenance costs);
- Fewer working days lost due to injury;
- Reduced risk of work-related ill health;
- Reduced stress and improved morale / job satisfaction;
- Less need for investigation and paperwork;
- Less lost time due to work rescheduling;
- Fewer vehicles off the road for repair;
- Fewer missed orders and business opportunities, reduced risk of losing the goodwill of customers;
- Less chance of key employees being banned from driving;

Employers have to identify which safety feature gives what benefit. Each safety feature needs a detailed investment-based business case, linked to the risks they have identified.

Collisions most often have financial implications on a

Item of cost	Sample data
Own damage costs	£1,000 (Eur 1,145)
Third party vehicle damage costs	£1,000 (Eur1,145)
Third party injury costs (eg Whiplash)	£1,000 (Eur 1,145)
Reported cost of collision	£3,000 (Eur 3,432)
Total cost of collision (including hidden costs at 2 times reported costs)	£6,000 (Eur 6,865)
Revenue required to fund a single collision at 10% return on Sales	£60,000 (Eur 68,649)
Widget sales (at 50p) required to fund fleet safety costs	120,000

2 © and Intellectual Property Dr Will Murray, Interactive Driving Systems, all rights reserved, 2009.

3 For a ranking of the life saving potential of vehicle safety technologies see:

- Cost-benefit assessment and prioritisation of vehicle safety technologies (EC 2005) [www.ec.europa.eu/transport/road-safety\\_library/publications/vehicle\\_safety\\_technologies\\_final\\_report.pdf](http://www.ec.europa.eu/transport/road-safety_library/publications/vehicle_safety_technologies_final_report.pdf)
- eImpact: (2008), Socio-economic Impact Assessment of Stand-alone and Co-operative Intelligent Vehicle Safety Systems (IVSS) in Europe [www.eimpact.info/download/eIMPACT\\_D6\\_V2.0.pdf](http://www.eimpact.info/download/eIMPACT_D6_V2.0.pdf)
- TRACE: Review of Crash Effectiveness of Intelligent Transport Systems [www.trace-project.org/publication/archives/trace-wp4-wp6-d4-1-1-d6-2.pdf](http://www.trace-project.org/publication/archives/trace-wp4-wp6-d4-1-1-d6-2.pdf)

business that stretch well beyond reported costs. This can be illustrated by the model of a collision’s costs presented in the table below<sup>2</sup>.

For this one incident a conservative decision to multiply by 2 the £ 3,000 figure to identify hidden costs was taken. To cover a £3,000 collision cost, £ 60,000 of revenue would be required, equating to sales of 120,000 units of this hypothetical company’s product. The company therefore needs to ask itself: “Is it easier to sell 120,000 units of our product or be more proactive in preventing this collision?”. In the current economic climate, such models are needed to justify up-front investments in safety programs. They can also be used to project long-term costs and potential returns on investment from adopting a proactive Fleet Safety Policy.

Finally, a proactive road risk program can also keep organisations ahead of and protected from regulations and legal requirements and help them gain a competitive advantage compared to more ‘reactive’ competitors.

## In-Vehicle Technologies: Description, Life-saving potential and Examples of use

This section will present the most important in-vehicle technologies and give examples of their use. The different technologies should be linked to tackling problems<sup>3</sup>. The table on page 4 gives an overview of possible interventions.



## Vehicle related interventions in the Prevention Model<sup>4</sup> Seat Belts and Reminders

Vehicle safety features can reduce the incidence and severity of crashes and the vehicle supply industry developed many technology-based interventions for fleet operators to consider in vehicle specification and purchase decisions. Note that in the Prevention Model passive measures are those that protect individuals automatically without any action on their part, including vehicle design changes. Active measures require individuals to actively participate in their own protection. This definition differs from the commonly used definition of active and passive safety, with active safety referring to interventions before collisions, and passive safety referring to interventions after collision (see ERSO [www.erso.eu/knowledge/content/50\\_vehicle/crash\\_avoidance\\_and\\_crash\\_protection.htm](http://www.erso.eu/knowledge/content/50_vehicle/crash_avoidance_and_crash_protection.htm)).

Seat belts are a highly effective way of reducing deaths and injuries with lasting effects to car occupants. Yet, despite the legal obligation to wear a seat belt, seat belts are still not always present in all seats and in all vehicles. Moreover, wearing rates still vary greatly across Europe especially between front and rear seats, different user groups and between urban and rural areas. Although much can be achieved through raising awareness, seat belt reminders can be an efficient way to increase seat belt use.

Seat belt reminders detect occupants and their seat belt use in all seating positions, and then create a series of alarms to alert the car occupant if he or she is not belted. There are different types of seat belt reminders – some issue only visual warnings while

	Passive (protect drivers automatically)	Active (involves driver participation)
<b>Proactive / Primary actions to avoid rashes</b>	<ul style="list-style-type: none"> <li>Speed limiter/intelligent speed adaption</li> <li>Electronic Stability Control (ESP)</li> <li>Wired in daytime running lights</li> <li>Visible colour</li> <li>Alcohol ignition interlock</li> <li>Self checking/inflating tyres</li> <li>Stronger/safer seats</li> <li>Mobile phones confiscated</li> <li>Automatic ventilation control</li> <li>Automatic reversing brakes</li> <li>EDR vehicle monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Cruise control</li> <li>Antilock braking systems (ABS)</li> <li>Daytime running lights</li> <li>High mounted rear centre brake lights</li> <li>Alcohol policy and testing</li> <li>Tyre check policy</li> <li>Ergonomic seat adjustment</li> <li>Mobile phone use banned</li> <li>Air conditioning</li> <li>Reversing warning devices &amp; cameras</li> <li>Driver near hit reporting</li> </ul>
<b>Reactive / Secondary / At-scene</b>	<ul style="list-style-type: none"> <li>Airbag including side/head protectors</li> <li>Seatbelt interlock/reminder</li> <li>Crashworthy vehicle (NCAP rating)</li> <li>Heavier vehicle</li> <li>Anti whiplash protection</li> <li>Crush zones and safety cages</li> <li>Fire resistant vehicle interiors</li> <li>Cargo barrier/load restraint</li> <li>Side and frontal impact protection</li> <li>EDR including crash recorders, forward/cab facing cameras and accelerometers</li> </ul>	<ul style="list-style-type: none"> <li>Quality front and rear seatbelts</li> <li>Seatbelt wearing</li> <li>Strong, easy to open doors</li> <li>Seat and head restraint positioning</li> <li>Correct head restraint use</li> <li>Child restraints</li> <li>Fire safety equipment</li> </ul>

<sup>4</sup> Murray, W., Pratt, S., Hingston, J. & Dubens, E. (2009). Promoting Global Initiatives for Occupational Road Safety: Review of Occupational Road Safety Worldwide (Draft), [www.cdc.gov/niosh/programs/twu/global](http://www.cdc.gov/niosh/programs/twu/global)

others issue both visual and auditory warnings. The potential to save lives is most effective when using seat belt reminders that disable ignition. But even audible seat belt reminders have a large life saving potential. Only a few car models are to date fitted with seat belt reminders for the rear seat. Compared with front seat systems, rear seat systems appear more costly because their installation is more complex.

ETSC has undertaken a cost-benefit analysis for the mandatory introduction of audible seat belt reminders for front seats in 2003 (ETSC 2003). It was based on the assumption that roughly 50% of fatally injured front seat car occupants killed in the EU did not wear seat belts and that audible seat belt reminders for the front seat could increase seat belt wearing among front seat occupants to 97%. After twelve years of introduction, the costs would amount to about 11 million Euro while the benefit would be 66 million Euros. The cost-benefit ratio would be 1:6. The situation of SBR in the EU has improved since 2005, when some 56% of cars were equipped with a SBR for the driver's seat; in 2008, it was 70%. However, big differences persist between particular types of vehicles. Whereas 97% of the Executive Cars sold in 2008 were equipped with a SBR for the driver seat, only 83% of the Multi Purpose Vehicles (MPVs) and 68% of the Super-minis were fitted (ETSC Pin 2009).

### Examples of compliance with Seat Belt use

A campaign called "Did it click?" ran by the German Road Safety Council (DVR) and the Statutory Accident Insurance in the Vehicle Operating Trades (BGF) together with other partners including the automotive industry, the haulage sector, and print media ran over 6 years. It led to increases of seat belt wearing rates from 10% to up to 50% in non-urban areas according to Police and DEKRA traffic observation reports<sup>5</sup>. The campaign is made up of personal communication with truck drivers at their rest places on the roadside of highways explaining

them the usefulness of wearing seat belts based on results from accident research. A roll-over simulator gives them hands on experience, a film gives additional information, especially on the compulsory use of seat belts for truck drivers. A leaflet and a sticker with the campaign logo are handed out to the drivers. Information about the place of further demonstrations are given also on a campaign Website [www.hatsgeklickt.de](http://www.hatsgeklickt.de)

Instead of seat belt reminders Scania trucks and Aral introduced a different non technical solution by fitting coloured seat belts. This was coupled with random checks by the employer.

### Speed Management Technologies

There is a well documented relationship between speed and collisions resulting in death and injury with lasting effect. The adaptation of driving speed to the prevailing conditions and speed limits is a primary way of controlling the crash risk of the driver. Different systems exist, ranging from informative to intervening systems. Intelligent Speed Adaptation (ISA) is an Intelligent Transport System (ITS) which warns the driver about speeding, discourages the driver from speeding or prevents the driver from exceeding the speed limit (Regan et al, 2002)<sup>6</sup>. Information regarding the speed limit for a given location is usually identified from an onboard digital map in the vehicle. Other systems use speed sign reading and recognition either using already built into the vehicle or aftermarket navigators.

There are two major types of systems – informative and supportive. An informative system gives the driver feedback in the form of a visual or an audio signal. A supportive system works in the form of increasing the upward pressure on the pedal or cancelling a driver's throttle demand if it demands more throttle than is required to drive at the speed limit.

A Swedish large-scale study of the effect of

<sup>5</sup> <http://www.dvr.de/site.aspx?url=html/presse/informationen/887.htm>

<sup>6</sup> Note that this definition is very similar to the one given for "speed alert" the term used in the EU ITS Action Plan: "The system alerts the driver with audio, visual and/or haptic feedback when the speed exceeds the local legal speed limit. The speed limit information is either received from transponders in speed limit signs or from a digital road map, requiring reliable positioning information." [http://ec.europa.eu/information\\_society/activities/intelligentcar/technologies/tech\\_18/index\\_en.htm](http://ec.europa.eu/information_society/activities/intelligentcar/technologies/tech_18/index_en.htm)

informative and supportive ISA, involving nearly 4,500 vehicles, shows that if everyone had informative ISA fitted, injury accidents could be reduced by 20% in urban areas (Biding 2002). Supportive systems have even greater potential to reduce fatal and serious accidents (Carsten et al 2008). Estimates by Carsten show that a mandatory supportive ISA scheme could lead to a reduction of 36% in road traffic (injury) accidents and 59% in fatal accidents. There would also be benefits in terms of lower fuel consumption (up to 8%) and more effective road traffic enforcement.

### Examples of Speed Management technology use

Examples of the implementation of ISA come mostly from Sweden. ISA systems have been installed in about 4,000 of the Swedish Road Administration (SRA) cars. A number of city municipalities have equipped their vehicles with informative ISA. The local buses in Lund for example are today equipped with an ISA system with auditory warning for the driver if he/she exceeds the speed limit. In Sweden ISA is also already used by several companies and between 50 and 60 local authorities, such as Stockholm and Västerås, on the basis of an informative system.

Some examples of companies are:

- Transport companies: SITA, Panaxia, Alltransport
- Taxi companies: Gävle taxi, TaxiBil Syd
- Rental car companies: Hertz
- Elevator supplier and service: Kone

Speed limiters have also been used by some companies. These limit the speed and are not as flexible as ISA. In the UK Royal Mail and Centrica have fitted speed limiters (limited to 70mph) on all vehicles including vans and put stickers on the back of all their vehicles to inform other road users of their self imposed speed limit.

Centrica, which owns British Gas, has many excellent initiatives in place for driver safety. In relation to Vehicle Safety Features, Centrica has taken the decision to restrict all future British Gas vans to a maximum speed of 70 mph. 3,400 Speed restricted vehicles were delivered during 2006, followed by 2,200 in 2007.

This initiative has positively influenced both road

safety and fuel consumption, reducing the potential for drivers to be involved in high-speed incidents. All vans now display a 70 mph maximum speed sticker on the rear doors to advise other road users. With their level of buying power, Centrica has now forced a number of high profile vehicle manufacturers to offer speed limitation as a standard option, contributing to wider road safety in the community.



British Gas has specified that all its new vans will be fitted with speed limiters set at 70 mph

### Adaptive Cruise Control (ACC) System

Adaptive cruise control (ACC) enhances classical cruise control and automatically maintains a following distance to the preceding vehicle (Liang et. al, 1999). The distance to the preceding vehicle is measured by radar either with laser radar or millimetre wave radar. When the vehicle ahead is driving more slowly than the adjusted speed the ACC system will control the vehicle speed and follow the lead vehicle at a safe distance. Once the road ahead is clear again, the ACC will accelerate the vehicle back to the previous set cruising speed. Some employers are being encouraged to purchase vehicles with ACC.

### Example of ACC Use

The Pöppel Company is a big Southern Germany based transport enterprise which transports dangerous goods, especially liquids. The company has 550 employees and a fleet of 200 heavy goods vehicles. The company focuses very much on improving its efforts for occupational safety and health. About 95 % of the vehicles are equipped with Adaptive Cruise Control Systems to avoid collisions. In the course of the campaign concerning the Driver Assisting Systems the company has obtained a subsidy from the BGF for 10 vehicles (see the BGF Initiative on Page12).

## Alcohol and Alcohol Interlocks

Driving whilst under the influence of alcohol contributes annually to at least 10,000 deaths on EU roads. In the EU as a whole around 1% of journeys are associated with an illegal Blood Alcohol Limit (BAC) (ERSO 2006). If the number of alcohol impaired drivers dropped to zero, some 6,800 lives would be saved, representing 16% of road deaths in 2007. Driving under the influence is less common in commercial transport compared to private transport. Yet, alcohol related road crashes in commercial transport tend to result in more serious outcomes due to the vehicle crash incompatibility caused by increased size and mass of commercial vehicles. Besides, the number of people injured in such a crash may be high in case of vehicles operated by public transport companies (Alcohol in Commercial Transport ETSC 2009 A).

Alcohol interlocks (also termed 'alcolocks') are devices that require the driver to take a breath test before starting the car. If the driver fails the test, the device locks the ignition of the car. Commercial use of alcolocks is the voluntary introduction either by public sector authorities or private commercial vehicle operators for a variety of reasons but mainly as a corporate responsibility towards road safety and limiting risk (Alcohol in Commercial Transport ETSC 2009 A). The gradual introduction of alcolocks starting with target groups (commercial drivers and repeat drink driving offenders) could reduce the high toll of drink driving casualties every year in the EU. Crucially in the commercial context alcohol interlocks must not be seen as a stand-alone issue but should be introduced as an integral part of an employer's drink driving policy. Indeed some employers have a zero tolerance to alcohol policy which is also specified in employee contracts. Alcohol interlocks can also be a good preventative tool for deterring drink driving for drivers still affected by alcohol the morning after drinking has taken place.

### Example of Alcohol Interlocks use

The most well-known example is the Swedish program (Silverans et al 2006) introduced late 1999 and aimed at increasing the quality assurance in commercial transport. The implementation

started with a small-scale demonstration project in partnership with a bus, taxi and truck company and was funded by the Swedish National Road Administration Vägverket (ibid.). One hundred vehicles of each company were alcolock-equipped. To minimise discomfort to the drivers and the risk of economic loss to the fleet owners, all alcolocks were programmed for 30 minutes stall protection, allowing to restart the vehicle motor without providing a breath test. Moreover, the alcolocks had a function that allowed the ignition to be on without the motor being running (for heating purposes, among other things), as well as a reset function for driver changes within the aforementioned 30-minute grace period (ibid.). Various facilities and regular control make fraud very difficult (Beirness, 2001). Finally, the commercial alcolocks did not have a running retest function. A first evaluation of attitudes among drivers, employers, customers and passengers showed that the alcolock was widely accepted as the best alternative to reduce drink driving (ibid., Lönegren 2003). However, it was also reported that there was a lot of mistrust in the beginning regarding the alcolocks due to technical problems with the devices and mistakes with regard to the servicing infrastructure (ibid). The problems need to be overcome as a matter of priority for the application to be effective.

In Belgium a taxi firm started a small alcolock trial in April 2008 supported by the alcolock supplier ACS Belgium. This is within the context of the development of new legislation. N Taxi is based in Mechelen and has a zero tolerance policy towards alcohol and drugs. All taxi drivers have to sign the house rules and commit to this policy on alcohol and drugs. Alongside its their zero tolerance policy the firm had a problem with a driver who lost his job due to an alcohol problem. Preventing a repeat of this was a further motivation for them to take up alcolocks. If a drink driving offence is detected by the alcolock the company director talks to the driver and gives them a warning. There has been a 20% increase in the company's business since the introduction of alcolocks. The biggest customers of N Taxi have supported the project and have commissioned more work for the small taxi firm. The taxi firm owners will extend the trial by keeping the current locks in the cars and introducing more alcolocks to other taxis (ETSC Drink Driving Monitor 2008).

## Electronic Stability Control

ESC acts on the braking or power systems of a vehicle to assist the driver in maintaining control of the vehicle in a critical situation (caused, for example, by poor road conditions or excessive speed during cornering). As well as saving casualties, the widespread use of ESC in vehicles could significantly reduce the traffic congestion caused by accidents involving large vehicles. ESC will become mandatory under the new EU vehicle safety regulation. Large differences in fitment rates within the EU member states make it even more important to have this legislation. In Sweden 96% of all new sold cars were fitted with ESC, while in many other EU countries the fitment rate may be below 30% (ETSC, 2008 A). A further variation of ESC is also on the market which adapts the capability to the load by calculating the vehicle's centre of gravity and its weight. This is particularly relevant for vans. Finally, it is also important to note that studies suggest that the impact of ESC varies with vehicle types. In New Zealand and Australia for example Scully and Newstead (2008) have suggested that ESC is more effective at preventing single vehicle crashes for SUVs than for passenger cars, given their greater risk of being involved in rollover crashes.

### Example of ESC Use

Napp Pharmaceuticals<sup>7</sup>, a Cambridge-based company, is one of the first UK fleets to answer calls for companies to take a lead in ensuring the life-saving anti-skid technology is a 'must have' feature. Following the launch of a Europe-wide 'Choose ESC!' campaign, which is designed to speed-up the take-up of the technology by fleets and private motorists, Napp Pharmaceuticals has taken its pioneering stance. The company operates an open choice 340-strong user/chooser company car fleet with Audi, BMW and Volkswagen models making up the majority of vehicles. The company has updated its driver electronic car ordering

system to make it impossible for company car drivers - sales representatives visiting pharmacists, hospitals and doctors' surgeries and headquarters' staff - to select a new vehicle that does not have ESC fitted.

### Event Data Recorders

Event or Accident Data Recording systems (EDRs/ADRs) are commonly known for their 'black box' type of use and were designed for aircraft or trains. They provide information regarding the circumstances surrounding a crash. A typical example for the use of EDRs is for the authentication of an incident for insurance claims or for the rejection of insurance claims (e.g.: drivers involved in a crash because of allegedly inappropriate speed). EDRs can be used for accident investigation as well as for driver monitoring. But EDRs are typically not designed for recording driving data as a tachograph because the recording is linked to a defined event trigger threshold. This could typically be a collision impact or a harsh driving manoeuvre. This depends on the functionalities required by the customer.

One comprehensive evaluation of the EDR impact on road safety, not limited to professional vehicle use, concludes that under a scenario where the technology would be implemented on a wide scale, there would be an average reduction of collision probability of 10% for deaths as well as for serious and light injuries (European Commission 2005)<sup>8</sup>. Benefits are estimated to outweigh costs by a factor of 7. For all the values used in the sensitivity analyses, benefits exceed costs. Thus EDRs/ADRs figure as number 2 in that evaluation among the most cost effective road safety technologies<sup>9</sup>. The VERONICA projects (2006 and 2009) propose the mandatory implementation of a standardised set of data elements with a defined functionality capable to record most collisions with harmful consequences.

Some stakeholders in Europe propose a solution to determine whether drivers display aggressive driving styles. This works through the use of in-car devices such as sensors and GPS systems that monitor the acceleration, speed, and movement of vehicles. Through these, the

<sup>7</sup> [www.napp.co.uk/Pages/default.aspx](http://www.napp.co.uk/Pages/default.aspx) [http://www.roadsafe.com/magazine/2007summer/fleet\\_chief\\_leads.html](http://www.roadsafe.com/magazine/2007summer/fleet_chief_leads.html)

<sup>8</sup> Cost-benefit assessment and prioritisation of vehicle safety technologies in particular 142 seq. (144) and p. 8) [www.ec.europa.eu/transport/roadsafety\\_library/publications/vehicle\\_safety\\_technologies\\_final\\_report.pdf](http://www.ec.europa.eu/transport/roadsafety_library/publications/vehicle_safety_technologies_final_report.pdf) (2005)

<sup>9</sup> Another study based on available practical experiences concludes that a reduction in the number of accidents by 20% would generate a reduction of 26,1% of lightly injured, of 36,9% of seriously injured and of 50,4% of killed road users (Bach 2000).

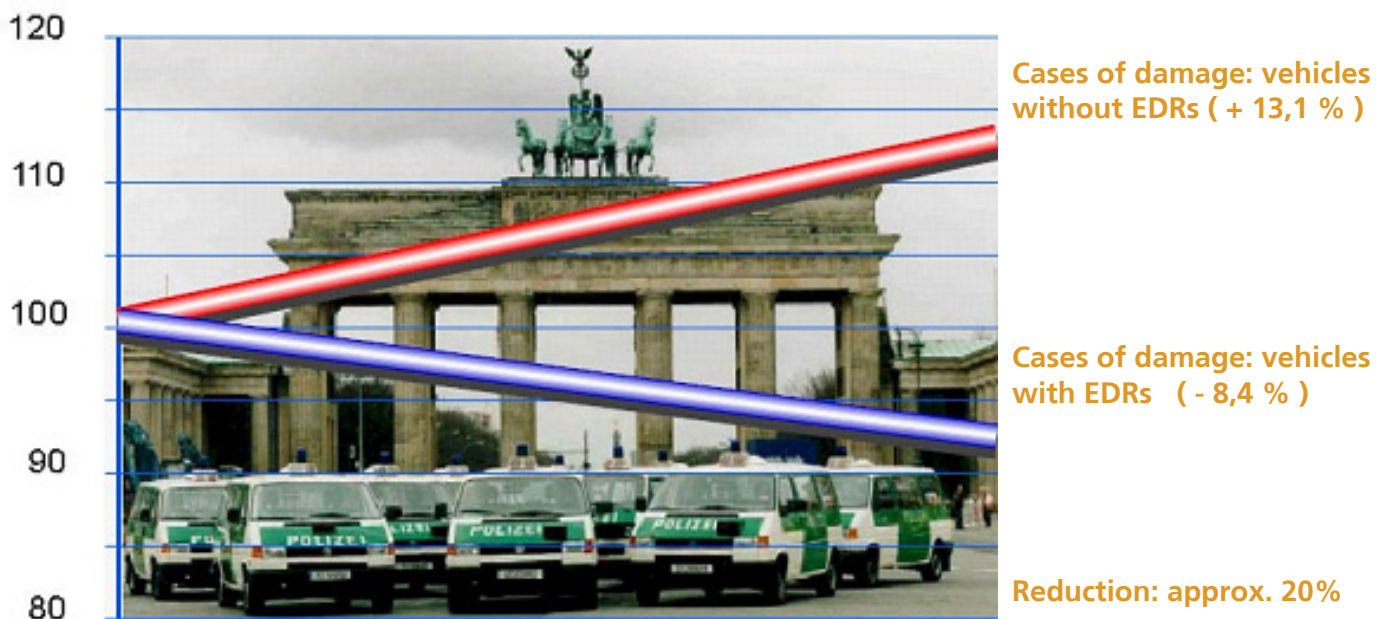
system analyses different types of manoeuvres and identifies for each manoeuvre performed during a trip whether it has been performed correctly or too aggressively (changing lanes abruptly, accelerating suddenly and so on). On the basis of this the system can identify risky manoeuvres, and empower drivers to manage their own safety by giving instantaneous in-vehicle feedback.

The information from the EDR can also be used as a management tool for driver training or to change the times of driving to avoid risky periods or routes. When using EDRs data protection concerns must be considered at an early stage and proper explanation of the appropriate use of data given to staff. It needs to be borne in mind that recorded incidents may go up at the start because collisions that were not reported previously start to get reported.

**Examples of EDR use**

Event or Accident Data Recorders have been introduced in a number of professionally used vehicle fleets throughout Europe since the mid-nineties. However not all companies want to reveal data as their technology gives them a comparative advantage over their competitors.

A well documented field test was also that of the Berlin Police conducted in 1997/98 (Rau/Leser 1998). Equipping all 380 radio patrol vehicles led to a 20% drop in accidents and a 36% drop in accidents involving emergency trips. It became clear that these positive effects are owed to a change of driving behaviour by those drivers who in the times before EDR implementation did not care sufficiently about the vehicles entrusted to them. It became also clear how important human leadership is in connection with the use of EDRs. Only if the staff and/or its representative body is involved early on and an awareness of the joint responsibility for the operational success can be achieved, which is ultimately in the interest of both, employers and employees, distrust and tensions can be avoided. However, positive impacts tend to fade out if monitoring and management efforts are not strictly maintained on a high level. A thorough analysis of the recorded damage events should be accompanied by appropriate restrictive measures. Negligence and effects of getting used to the system might otherwise discredit the potential enshrined in the implementation of EDR. In other words a framework of institutional rules with incentives and disincentives is recommended.



**Damage reduction in EDR equipped Berlin Police fleet 1997-1998: 381 vehicles**

Another example involves the Rotterdam-Rijnmond police, which achieved a drop in damage costs of 25.1% with 100 EDR units between 1999 and 2000. This led to the police insurers refunding 45,000 Eur in premiums for 2000 and reducing premiums by 90,000 Eur for 2001. The investment in EDR had paid for itself within a year.

“About fleet”, a Swiss magazine focusing on company vehicles and fleet management, reports in its 2/2009 edition (p. 43) about “polyrose”, a swiss company specialised in the delivery of medical and pharmaceutical products. The experiences made by PolyRose with its 100 vehicles, 20% equipped with EDRs capable of recording also risky driving maneuvers, revealed that the drivers with the largest number of accidents also had a record of bad driving performance which included high ratios of driving curves on the limit and of emergency brakings. Consequences were a process of direct dialogues with the drivers to raise their awareness, a driver training programme, consultation with ophthalmologists and subsequently a sustainable reduction of the damage frequency and the number of damage claims. Similar experiences were made with Securitas and Post-Logistics.

### Following Distance Warning

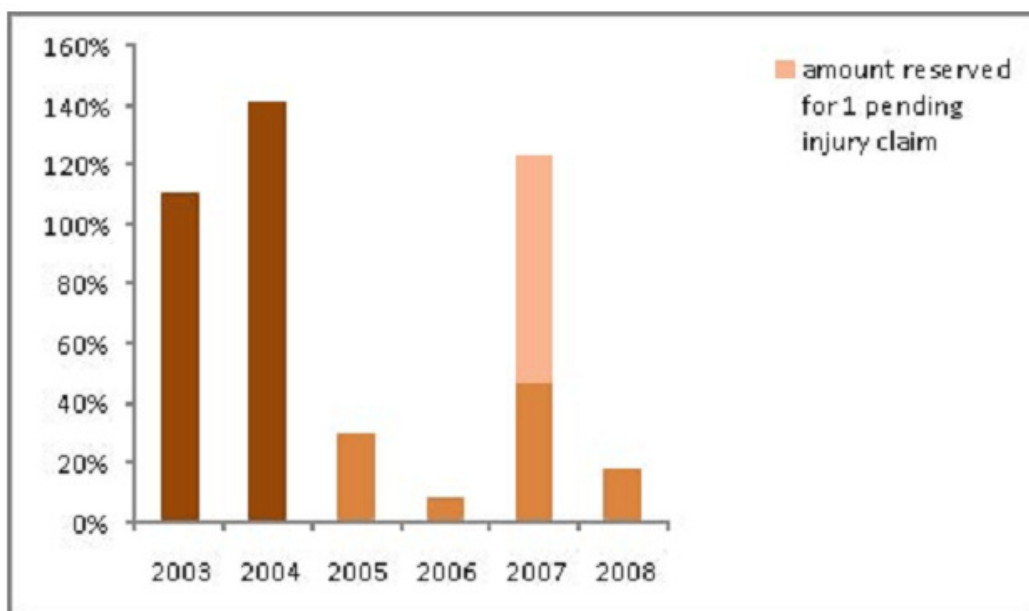
The distance warning system warns both visually and with a sound that the driver is too close to a vehicle. The warning depends on how long the distance is between the vehicle and the vehicle ahead (Regan et al, 2002 A). The level of warning will switch from “safe” to “critical” as distance decreases. Systems with auditory warnings have been proven to be effective warning mechanisms. Driver inattention, or failure to pay adequate attention to the driving task, is the single most common cause of front-to-rear end collision crashes. The following distance warning system was installed in trucks in the US and has the potential to reduce the rear impact by 57%.

### Example of Following Distance Warning use

Drivers who took part in a training scheme in Germany including the use of different Driver Assistance systems

### Marcel Ziwica, Polyrose Member of Board:

*-We want to make our vehilce fleet safer. We work with AXA Winterthur as they can help us achieve that goal.  
-Our investment is bearing fruit: the number of accidents in our fleet has fallen considerably. We have increased the safety of our drivers, and reduced direct and indirect costs from damage.*



Claims reduction, Polyrose EDR equipped fleet; source: AXA-Winterthur Accident Research

reported that they appreciate the Following Distance Warning as one of the most helpful technologies. The Statutory Accident Insurance in the Vehicle Operating Trades (BGF) offers all companies training in which drivers are first informed about the systems, can try them and can also exchange experience of having used them. So far 400 drivers have taken part<sup>10</sup>.

## Emergency braking

Emergency Braking is already present in some vehicles. This will be extended to all large vehicles in 2013. The aim of Emergency Braking is to avoid collisions fully automatically or to mitigate them. The system reacts if a vehicle approaches another leading vehicle or obstacle. The system reacts in three steps:

1. Optical and acoustic warning, if the approaching obstacle could lead to an accident.
2. Autonomous partial braking, if the distance is reduced further.
3. Autonomous full braking, if an accident appears inevitable. Input is the distance and the relative speed to a leading vehicle.

The system reduces impact speed in case of immediate danger, which increases passive safety and reduces accident consequences:

- Reduced risk of injuries / collision mitigation through decreased impact velocity
- Reduction of braking distance through immediate braking action and adapted, improved brake assist function
- Support for collision avoidance and collision mitigation

This has an estimated death reduction of 7% on the EU 25 scale with full penetration, and one of the highest benefit-cost ratios there is for driver support systems<sup>11</sup>. The eSafety Forum included it as one of the priority systems in 2008.

## Route Planning

Travel behaviour can be affected by ITS applications that mainly provide the traveller with a better basis for decisions in terms of traffic and travel information. In the field of ITS, travel planners have been developed on-line. The typical solution is based on the internet giving the answer of how to get from A to B taking various requirements into account. This can also be complimented by help of in vehicle satellite navigation systems. This may give information on time of arrival, time of departure, travel time, travel cost and be of relevance to route planning at work. Technologies to help with journey planning can also direct drivers along the most efficient routes. They can be linked to technologies used out of the vehicle to do with scheduling of shifts and link to managing fatigue. Some satnavs and journey planners already take into account school times to direct drivers away from schools during peak times.

An EU funded project called "HeavyRoute"<sup>12</sup> has developed tools, systems and collected data to link Europe's road infrastructure via electronic mapping systems to the truck operators and drivers. It is hoped this will contribute to the overall road safety and congestion both giving route information before the trip commences and on-trip.

## Fatigue and Drowsiness Detectors

Research shows that driver fatigue is a significant factor in approximately 20% of commercial road transport crashes (ETSC, 2001). Fatigue affects drivers when they start to become tired as they can't concentrate properly on driving and can't respond as quickly and safely as they should.

Research has also been undertaken to track the drowsiness of drivers and advise them to take a break if alertness starts to fade. One of the technologies includes tracking the pupil. Tests have been carried out

10 [www.fahrer-assistenz-systeme.de/2008/index.php?id=57](http://www.fahrer-assistenz-systeme.de/2008/index.php?id=57)

11 eIMPACT Project Results [www.eimpact.eu/download/eIMPACT\\_D6\\_V2.0.pdf](http://www.eimpact.eu/download/eIMPACT_D6_V2.0.pdf)

12 [www.heavyroute.fehrl.org](http://www.heavyroute.fehrl.org)



by Volvo Trucks in Sweden in 2008 involving 68 drivers. Mercedes has developed a system which is already on offer in E-Class cars called 'Attention Assist' which observes driver behaviour such as speed, lateral and longitudinal acceleration and steering wheel movement. If the system detects typical indicators of drowsiness the driver will be alerted by an audible signal and flashing message to take a break.

Of course, the bottom line here is always that the most effective countermeasure for fatigue is sleep. Fatigue detectors will only therefore be effective in so much as they are used to ensure drivers take some sleep.

### Example of the promotion of driver assisting systems

In Germany the Institution for Statutory Accident Insurance in the Vehicle Operating Trades (Berufsgenossenschaft für Fahrzeughaltungen BGF) has set up a scheme with a Eur 2,000,000 budget available to transport sector enterprises to invest in their heavy goods vehicles with driver assisting systems. An employer can apply for Eur 2,000 per vehicle as an investment aid if the new truck is equipped with the following three driver assisting systems:

ACC: Adaptive Cruise Control  
LDW: Lane Departure Warning  
ESC: Electronic Stability Control

The BGF plans to assess the effectiveness of these measures up to the year 2010 by comparing accident data for 1,000 vehicles that are equipped with the systems, with data for another 1,000 vehicles without the assisting systems. Driver training concerning the advantages and risks associated with the systems is also part of this campaign. The campaign is a joint venture of various partners (BGL, KRAVAG), car manufacturers (IVECO, MAN, Mercedes Benz), with different levels of engagement. The campaign was launched on 23rd May 2008 under the patronage of Mr. Günter Verheugen, Commissioner for Enterprise and Industry (EU-OSHA 2009).

### Existing EU Level Initiatives

At present there are a number of EU initiatives including legislation and information campaigns that will promote the use of in vehicle technologies although none specify prioritising them within the work related road safety context.

#### **"Type Approval requirements for the general safety of motor vehicles" (COM 2008/316)**

The new regulation on the "Type Approval requirements for the general safety of motor vehicles" (COM 2008/316) advances the deployment of a number of in-vehicle technologies. ESC for new car series and commercial vehicles will be phased in from 2012, with all new cars being equipped by 2014. Advance Emergency Braking Systems will be in all large vehicles from 2013. Lane Departure Warning systems will also be introduced to all large vehicles by 2013. The Regulation also foresees the compliance with the provision of visual and audible seat belt reminders for the driver's seat by the 1st of November 2012. This could particularly help raise the seat belt wearing rates amongst HGV drivers.

#### **Directive on Intelligent Transport Systems (COM 2008 887) and Action Plan (COM 2008 886)**

The EU ITS action plan suggests a set of concrete objectives and a Directive laying down the framework for the implementation of ITS stressing that they can contribute to making transport safer, more efficient and competitive, more sustainable and more secure. The EU ITS Action Plan also includes a number of proposed measures specifically related to in-vehicle technologies (ESC, ACC, lateral support, emergency braking, eCall, Speed Alert and alcohol interlocks) for safety. Under Area 1 of the ITS Action Plan and in the Directive there are provisions for the optimal use of road, traffic and travel data. This includes the definition of procedures for the provision of EU-wide real-time traffic and travel information services and optimisation of collection and provision of road data and traffic circulation plans, traffic regulations and

recommended routes. This also includes definition of procedures for accurate public data for digital maps. The provision of such a digital database of all speed limits on the network is an important prerequisite for the implementation of ISA. the driver's seat by the 1st of November 2012.

## eSafety Forum and the Intelligent Car Initiative

These initiatives were both launched in 2006 to promote the use of information and communication technologies for smarter, safer and cleaner road transport. The eSafety Forum, is the first pillar of the Intelligent Car Initiative, and is a joint initiative of the European Commission, industry and other stakeholders. It aims to accelerate the development, deployment and use of Intelligent Vehicle Safety Systems that use information & communication technologies to increase road safety. It also coordinates the stakeholders and meets regularly. The Intelligent Car Initiative aims to support research into intelligent vehicle and cooperative systems and take up research results. Information dissemination is the other activity field of the Intelligent Car Initiative and it ran the first awareness raising campaign: Choose ESC!

## Recommendations to the EU

### 4th Road Safety Action Programme

- Recognise the contribution of in-vehicle technologies by employers in improving road safety and contributing to the EU target of reducing deaths on Europe's roads beyond 2010.
- Encourage employers managing fleets (also those of EU institutions) to purchase vehicles with in vehicle technologies which have high life saving potential.

### Public Procurement

- Adapt the EU Directive on the promotion of clean and energy-efficient road transport vehicles<sup>13</sup> to include in vehicle technologies for safety in public procurement.

### Seat Belt Reminders

- Adopt legislation to ensure that every new vehicle has as standard equipment an enhanced seat belt reminder system for all occupants with audible and visual warnings. This is of particular relevance to increase seat belt wearing rates of drivers of commercial vehicles who tend to have low average seat belt wearing rates.

### Speed Management Technologies

- Encourage further roll out of speed management technologies including ISA amongst particular user groups such as government vehicle fleets, public buses and company vehicle fleets including those of rental car companies. In the medium term adopt legislation for the mandatory fitting of all fleet cars with speed management technologies including Intelligent Speed Assistance systems.

### Alcohol Interlocks

- Support the development of uniform standards and a high level of reliability for alcohollocks in Europe to pave the way for legislation in the medium term making alcohollocks mandatory for commercial transport drivers.

### Event Data Recorders

- Contribute to the development of harmonised standards of in-vehicle "Event data recorders" functionalities to record collisions with most harmful consequences. Encourage the wider use of in-vehicle "Event data recorders" in fleets.

13 Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles.

## ITS

- Within the context of the EU's ITS Directive and Action Plan, regularly monitor developments in passive and active safety technologies for fleets for standard setting followed by market penetration or eventual legislation for their deployment.

## Road Safety Charter

- Recognise specifically the use of in-car technologies by employers who have implemented successful programmes within the scope of the Road Safety Charter.

## Research

- Influence the development of in-vehicle technologies in fleets which are linked to tackling the biggest causes of road death by allocating additional research and development budget.

## EU Member State Level Legislation and Policies

Some Member State governments have taken action to improve work related road safety and a number of these have also specifically promoted in-vehicle safety technologies as part of their policies. Beyond the Risk Assessment required by EU legislation some governments have legislated further that employers should take specific action on improving road safety at work. In the UK, Health and Safety at Work legislation includes the requirement of ensuring health and safety of all employees while at work and not putting others at risk by work-related driving activities<sup>14</sup> (DfT 2003).

Others take the non-legislative approach and encourage employers to take action via different initiatives such as in France. Governments can bring about change by setting an example. They can influence demand through their own public

procurement policies. There is in fact great potential to do this. All non-private customers, such as governmental bodies, local authorities and companies can play an important role by including specific requirements on minimum safety levels in their vehicle purchase and leasing policies. In doing so, public authorities and companies contribute to the market penetration of safer cars by supporting the demand for such vehicles and for safety technologies, which hopefully in turn help lowering the price of safety technologies.

### Swedish Road Administration leads the way with Safety Requirements for their vehicles

Since the 1st of February 2009 Sweden introduced compulsory rules for governmental authorities concerning environmental and traffic safety requirements when purchasing a vehicle. The goal is that 75% of governmental authority vehicles (11, 000 vehicles or 0.23% of the vehicle fleet in Sweden) shall be fitted with alcohol interlocks by 2012. Some governments also take a specific interest in promoting EuroNCAP ratings and in-vehicle technologies to employers. Moreover there are NGOs active in some of the leading countries that are running different initiatives to promote work related road safety by directly working with business. Within this context some action is also taking up the issue of specifically promoting the use of in-vehicle safety technologies amongst employers.

As part of its travel policy, the Swedish Road Administration has set up strict requirements for cars used on official business. Requirements are regularly updated and will continue to be in order to raise the standards on energy efficiency, vehicle emissions and safety<sup>15</sup>. Cars rented for less than 6 months must meet specific requirements such as:

- Be awarded 5 stars for occupant protection by Euro NCAP
- Be equipped with Electronic Stability Control (ESC)
- Be equipped with a seatbelt reminder on the driver seat that meets Euro NCAP requirements

14 The Corporate Manslaughter and Corporate Homicide Act Newer legislation adopted in 2007 in the UK introduces an important new option for certain very serious senior management failures which result in death.

15 [www.vv.se/Andra-sprak/English-engelska/Facts-about-the-Swedish-Road-Administration-/Policy-documents/Travel-policy/](http://www.vv.se/Andra-sprak/English-engelska/Facts-about-the-Swedish-Road-Administration-/Policy-documents/Travel-policy/)

Cars rented for more than 6 months must also meet additional requirements such as:

- Be awarded at least 2 stars for pedestrian protection by Euro NCAP
- Be equipped with an alcohol ignition interlock
- Be equipped with an informative or supportive Intelligent Speed Assistance system.

Those requirements are also used by other public bodies and private companies. A brand new national law requires all government bodies to buy or rent only 5-star Euro NCAP cars for occupant protection ("government specification" as is the case for environment standards). This also has another overspill effect as rental companies, such as Hertz, Avis and Europcar, are upgrading their whole fleet to offer 'SRA recommended cars' to all their customers (PIN Vehicle Flash 13 ETSC 2009).

### **Driving for Better Business Initiative in the UK**

In the UK the Department for Transport runs a Driving for Better Business outreach programme. This supports business leaders who have successfully managed driving for work in their companies to take the message, at high level, to business more widely. Roadsafe is the Department's partner in delivering the programme. Its main activities have been to recruit 'champions' from the business community, identify partners for pilot project; and engage a wide range of other commercial and road safety interests. Roadsafe has worked closely with the Department and its driving-for-work campaigns and has developed links with the National Business Travel Network (also DfT sponsored).

### **France: Committee to Prevent Road Risk Amongst Professional Transport**

In France the Government took the initiative to set up the "Steering Committee to prevent road risk amongst professional transport", an organisation responsible for advising a number of government bodies and

putting forward proposals on work related road safety. The work of the Committee has the potential to reach 22 million employees in France. The Committee also disseminates information to all stakeholders involved in work related road safety, including the private sector.

The Committee underlines that both road safety 'at' work and road safety 'to' and 'from' work (commuting) should be addressed, and in this light in 2008 the French Interministerial Committee on Road Safety has asked the various Ministries to consider whether it would be possible to define motor vehicles a piece of work equipment.

The Committee is also involved with the private sector actors, a number of which have signed charters declaring that road safety is one of their key concerns. The Committee also organises an awards programme to congratulate and encourage companies concerned with road safety to continue investing efforts. One of the awards concerns fleet management. When it comes to fleet management the Committee is especially concerned with Light Commercial Vehicles (LCVs), and publishes the following recommendations in terms of in-vehicle equipment: Airbags, ABS, ESC, a visual display in the dashboard in case of vehicle overload, and tyres fit for the professional use of vehicles.

### **Germany –"Best Co-Driver": Campaign of the German Road Safety Council**

Three years ago the German Road Safety Council (DVR) has launched a campaign on Advanced Driver Assistance Systems including ACC, ESC and Lane Departure Warning. It is mainly focused on reaching media message multipliers such as the print media and radio stations to inform the general public about driver assistance systems. In the course of the campaign, employers and politicians have been invited to demonstrations and training for the use of ADAS. An easy to use brochure has been developed (also in English) about the different technologies and their life saving potential. DVR has also created a database where purchasers of vehicles including employers can find the availability and cost of the technologies for each vehicle type<sup>16</sup>. This campaign is connected to the EU's eSafety Aware Initiative.

## Recommendations to Member States

### “Be the Market”

- Include safety criteria (including in-vehicle technology) for purchase of vehicles in public procurement requirements.
- Influence the development of in-vehicle technologies by allocating additional research and development budget to those with the most life saving potential.

### Disseminating information

- Support employers to fulfill their legal requirements to undertake a risk assessment. As part of this provide information and training to fleet managers to inform them about the need to consider in-vehicle safety technologies in the new vehicle purchase and lease process and in how to conduct a fleet risk assessment, with supporting examples and case studies.
- Highlight the need for a wider use of in-vehicle technologies with a high life saving potential especially in fleets.
- Promote vehicle safety information, such as EuroNCAP results (especially the safety equipment rating) more widely and effectively so that they play a more prominent role in new vehicle choices and fleet purchasing policies.

### Financial Instruments

- Give incentives to employers investing in vehicle safety technologies but need to manage the systems that are put in place – not box ticking.

### Legislative Instruments

Consider the classification of the vehicle used at work as a piece of work equipment.

- Revisit exemptions from seat belt wearing legislation of some blue light fleets (and taxis), especially as now seat belt technologies improved and seat belt can be released in much faster time and based on evidence, compare the risk to taxi/bus and blue light drivers/passengers on non-seatbelt use.

## Initiatives of Employers to introduce In-Vehicle Technology

Private sector awareness and engagement in road safety is increasing, and is essential for the alleviation of the injury and death toll in road transportation at large. Indeed private sector actions can help protect not only professional drivers but all road users. The private sector is nowadays expected to be socially responsible, which in the field of fleet management very often means going beyond legal requirements. Innovations in vehicle safety equipment are developed and hit the markets at a very fast pace (much faster than the time it takes to legislate on their use) and fleet vehicles are most often the quickest route to get vehicles fitted with such innovations on the roads. Large fleet operating organisations can also literally influence the market by using their strong purchasing/consumer power and dictate what sort of vehicles and equipment hit the market. The vehicle industry has already started responding by marketing vehicles such as the “safety van” which includes the latest safety features in their state of art vehicles<sup>17</sup>. As such they have a moral obligation to provide not only their employees with safe vehicles but also help profit road safety at large.

In terms of vehicle safety and in-vehicle equipment what employers can do ranges from purchasing safer vehicles to fitting very advanced safety equipment to their fleet.

## Recommendations for Employers

### Getting started

- Undertake a risk assessment and draw up a road safety action plan. Based on priorities identified in the assessment and as part of corporate/organisational transportation and occupational health responsibilities

<sup>17</sup> [www.mercedesbenz.co.uk/content/unitedkingdom/mpc/mpc\\_unitedkingdom\\_website/en/home\\_mpc/van/home/vans\\_world/innovation/safety\\_van.html](http://www.mercedesbenz.co.uk/content/unitedkingdom/mpc/mpc_unitedkingdom_website/en/home_mpc/van/home/vans_world/innovation/safety_van.html)

include in-vehicle technologies as part of the solution as appropriate.

## Vehicle selection

Fleet vehicle purchase decisions have the potential to have a dual impact on road safety: there is some evidence that fleet or company vehicle drivers may be more at risk than private vehicle drivers (Bibbings, 1997), and the penetration rate of ex-fleet vehicles in the second-hand vehicle market is very large, providing a penetration of new technologies into the vehicle market at a rate faster than there otherwise might. Over 50% of new vehicles are initially purchased for commercial purposes. Most of these vehicles will be integrated into the wider vehicle pool within two to three years. This means that the more safety features fleet buyers specify, the more they help the general vehicle pool to become safe relatively quickly.

Purchasing safe vehicles is therefore an excellent way for employers to provide a safe working place to their employees; however some evidence suggests that other considerations still outrank safety in fleet vehicle purchase selection (Koppel et al., 2007). Koppel et al. (2007) compared both Spanish and Swedish fleet managers' responses to vehicle purchase questionnaires and found that vehicle safety is not the primary consideration in both countries, but is outranked by factors such as price, running cost, reliability, size, and fuel consumption. Interestingly vehicle safety did not appear to be significantly more important to Swedish fleet managers. Regarding how to find safety information, EuroNCAP ratings were only cited by a small proportion of Swedish fleet managers and no Spanish fleet managers as the most valuable source of information. Overall this suggests a need to increase the profile of vehicle safety, and provide information about where to find objective safety information, such as EuroNCAP, to fleet managers (rather than letting them rely on manufacturers' information: manufacturer website / dealership etc.).

Providing passive protection through product or

environmental design is a good strategy. Thus employers anticipate human failure and specify passive safety features on vehicles, as this does not require any difficult behavioural changes. The counter argument is that it lowers driver concentration and skill levels. In reality, a combination of both is generally implemented in organisations (see Prevention Model table above).<sup>18</sup>

- Include safety criteria when purchasing vehicles, including 5 star Euro NCAP cars and vehicles using in-vehicle safety technologies.
- Include pre-crash features to help reduce the chances of a crash and at scene and post crash safety features which are designed to prevent or minimise injury to the vehicle's occupants in the event of a crash. Active features involve driver action, Passive features do not.
- Specifying as many safety features as possible, to avoid collisions (ABS or ESC) and reduce injury (quality front and rear seatbelts) can improve safety and increase vehicle resale values.

Guides to select safer vehicles are also provided at:

[www.landtransport.govt.nz/vehicles/](http://www.landtransport.govt.nz/vehicles/)

[www.monash.edu.au/muarc/about/RS040134pdf](http://www.monash.edu.au/muarc/about/RS040134pdf)

## Managing staff and use of in-vehicle safety technology

- Safety features are not an excuse for ignoring the wider fundamentals of fleet risk management. For example, employers should ensure that employees always wear their seatbelts – as well as just having them in the car.
- Communicate vehicle safety technologies purpose (i.e.: this is for your own good and we value you and are concerned for your wellbeing!) to employees and train them to use equipment properly.

<sup>18</sup> Adapted from © and Intellectual Property Dr Will Murray, Interactive Driving Systems, all rights reserved, 2008

- Apply in-vehicle safety technology criteria to the management of “grey fleet” (grey fleet vehicles are employees’ own, ‘private’, vehicles when used for work) and lease vehicles.
- Try to encourage “ownership” of vehicle and driver as much as possible (1 vehicle = 1 driver) as experience has shown greater care in looking after the vehicle and included technological equipment benefits from such use.

### Working with third parties

- Choose contractors who also apply road safety to their work and fit safety equipment to vehicles safety as part of the supply chain.
- If possible influence vehicle manufacturers through high purchasing consumer power.

### Event Data Recorder Use

Based on experience so far employers should:

- Develop a contractual and binding system of incentives and sanctions to generate and maintain the necessary level of cooperation between the insurance company and the fleet operator.
- Instruct the staff about the use of EDR, its data and possible consequences; set up also here a system of incentives and sanctions.
- Download and evaluate EDR data regularly for taking practical measures within the fleet.<sup>19</sup>

### Downsides of technologies, potential barriers and how to overcome them

In-vehicle technological features are welcomed only after verifying their life saving potential. They must be implemented carefully with proper training to avoid a number of downsides. One major downside is the so-called risk compensation effect. This is an effect whereby individuals may tend to adjust their behaviour in response to perceived changes in risk.

There is evidence to suggest that such an effect can be linked to the use of safety features in vehicles. This is particularly compelling for the case of antilock braking systems (ABS). There have been experiments asserting that drivers adapt to the safety benefit of ABS by driving more aggressively, and there is empirical evidence that collisions occurred after the introduction of ABS because of people testing the system’s thresholds (Aschenbrenner and Biehl, 1994).

Technologies like ABS place over emphasis on reactive safety, rather than proactive safety and careful driving. Drivers must drive carefully at all times (ABS is designed to help the driver maintain control of the vehicle during emergency braking situations, not make the car stop more quickly). To gain any safety advantage from ABS, drivers must learn how to operate it correctly (Murray 2008).

### Data security and protection, and liability issues

The handling of data (notably personal data) in in-vehicle applications raise a number of issues, as citizens’ data protection rights are at stake. At the same time, data integrity, confidentiality and availability must be ensured for all parties involved, especially citizens. Finally, the use of applications create additional requirements in terms of liability. These issues can be a major barrier to wide market penetration of some technologies if citizens’ rights are not shown to be fully protected. The EU’s ITS Action Plan proposes to assess the security and personal data protection aspects related to the handling of data in ITS applications and services and propose measures in full compliance with Community legislation. Furthermore it also aims to address the liability issues pertaining to the use of ITS applications and notably in-vehicle safety systems (EC 2008 ITS Action Plan).

Who is responsible if a system fails and the car is involved in a crash? The usual case when a crash occurs is that the driver is responsible for an accident. However, in the case where a failure of technical equipment is in part responsible for a crash, it has to

<sup>19</sup> A comprehensive study on what is necessary in practical and organisational terms to make successful use of EDR in fleets was presented by Christian Nasca for Winterthur Versicherungen (Accident Research), [Investigations on the use of Accident Data Recorders

be determined whether the crash would have been avoidable if the system was functioning correctly, and whether the driver had the chance to overrule the system. Collisions rarely meet all the conditions to determine that the failure of a technological component alone is responsible. In Germany for example Menzel (2004) notes that there are no cases known in which an unavoidable accident occurred only because of a failing ADAS (advanced driver assistance system). The liability argument is often put forward when technological advancements hit the markets, however many of the handling and engine management packages currently on offer in vehicles intervene in some way between the driver and the controls of the vehicle. However with all these, the driver does remain in control of the driving task (ETSC, 2006). Furthermore, manufacturers of in-vehicle equipment tend to protect themselves with disclaimers in their manuals, so that it becomes very difficult for customers to prove that the damage has been caused by system failure.

## Conclusion

In conclusion in-vehicle technologies can make a life saving contribution to improving road safety at work. Crucial to their effectiveness however is that they are integrated into management structures that address the greatest risks. Employers should make every effort to apply them but also train staff on their use and monitor their implementation. At a European level the deployment of life saving technologies should be prioritised in the upcoming ITS Action Plan and Directive. Their use within the context of improving road safety at work should also be included in the new 4th Road Safety Action Programme. They should be prioritised by all according to their greatest life saving potential.

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# “PRAISE”: Preventing Road Accidents and Injuries for the Safety of Employees

October  
**09**

Fact Sheet  
**1**

**DB** SCHENKER



ETSC has launched in 2009 its PRAISE project, “Preventing Road Accidents and Injuries for the Safety of Employees” to mobilise knowledge needed to create work-related road safety leadership. The project will advance the awareness of the need for work-related Road Safety Management and provide the know-how to employers who have to take on that challenge. It also aims to present the work-related road safety standards of road safety champions, by presenting employers success stories, notably through the PRAISE Fact Sheets. This Fact Sheet follows from the PRAISE Report on in-vehicle safety equipment published in September. The report can be accessed here: [PRAISE Report 1](#).

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## DB Schenker Introduction

DB Schenker in Sweden offers domestic and international logistics services for all modes of transport to companies on the Swedish market. At present road transport dominates DB Schenker activities. DB Schenker customers are mainly large and medium sized companies in the industrial, commercial and food sectors. DB Schenker in Sweden has approximately 300 contracted haulage companies (subcontracted) with a total fleet of 4,000 vehicles – one of the haulage companies is a sister company, Schenker Åkeri AB (530 vehicles).

## Road Safety management at DB Schenker

1. DB Schenker adopted the Swedish Vision Zero for Road safety, what triggered that decision?

DB Schenker is the leading logistics provider on the roads in Sweden with more than 4,000 vehicles belonging to our domestic fleet. It is thus necessary from many different aspects to see to it that we have safe vehicles and our employees behave in a correct and safe manner. The triggering factor however was when DB Schenker deepened its contacts with the head office of the Swedish Road Administration (SRA) in Borlänge in 2002. An in depth study of serious accidents which involved any vehicle contracted by DB Schenker was carried out and a working group to tackle this topic was formed. This working group, called "Schenker-Ola", is still functioning today. The forming of this group was the trigger of our adopting "the Vision Zero".

We think that transport companies have a duty to do all they can to avoid collisions, and as much as they can try to go even further than just applying the basic legislative framework for road traffic. A true concern for your drivers and fellow road users is a necessary starting point. In the end, no serious company can ignore the consequences

of a serious road accident, and investing in road safety will also be a good means to defend your market brand.

2. In 2004 you have developed a road safety strategy, can you briefly describe it?

The strategy is based on the priority areas of action that we have identified and that form our Road Safety Policy. It highlights four very important, yet simple principles:

- No speeding
- No alcohol or drugs
- Safety belts should always be worn
- Cargo should be secured properly

3. Can you provide any figures tracking the improvements in your safety performance over the years?

Not yet, but we hope to be able to share such statistics in a couple of years time. The principal reason for this is that the 4,000 vehicles mentioned above do not belong to Schenker, but to individual haulage companies contracted by Schenker. The information regarding collisions / injuries / death has until the beginning of this year been kept by the hauliers in question. From January 1st 2009 we have an interactive form for reporting all kinds of traffic collisions and also, if it can be determined, the reason for the accident. This is the beginning of a very important monitoring process for us.

4. How is your transport safety management organised?

Road Safety is part of several executives' list of duties: the main sponsor of the road safety work within Schenker AB is Mr. Bo Hallams, Marketing Director and member of the management team. Road safety is also the responsibility of our environmental manager and within our Land division's traffic department the responsibility for road safety is organised within the group for traffic development. Furthermore, each contacted haulage company has of course the direct responsibility to follow laws and regulations in relation to road safety.

## 5. What is the leading cause of collisions in your land transport operations?

The number of accidents occurring and reported is rather small, so it is difficult to draw conclusions, but we suspect that a lack of speed adaption to the current road and traffic conditions is a leading cause. We have drawn this conclusion by participating in workshops with representatives from the SRA, the traffic police and other actors.

## 6. How do you get other haulage companies collaborating with you to take your safety requirements or recommendations on board?

We publish some information via our special website for contracted hauliers, and we also have our own company magazine. However most important is the direct dialogue between us and the owners of the haulage companies in question.

## 7. Do you consider that there is a solid Business Case to invest in road safety?

Clearly road safety measures are likely to lead to savings in fuel cost, and vehicle maintenance / repair cost. We cannot give precise figures regarding this as such information belongs to our individual haulage companies, but in general we feel that road safety activities fit in very well with our concerns such as the environment / product quality assurance, etc. This can only be good for business. For example our customers are reassured in knowing that we have strong safety standards, and we mainly spread the message through communications such as our sustainability report and by partaking in events like trade fairs.

## 8. Will you consider getting the upcoming ISO 39001 certificate on road safety management?

Yes, we could certainly consider that as we already are certified according to ISO 9001 (on Quality Management) and ISO 14001 (on Environmental management). It would be a logical step.

## Specific area: Alcohol

### 1. What are the main elements of your company's policy to prevent drink driving?

Our own haulage company "Schenker Åkeri AB" (530 vehicles) has equipped every new vehicle since 2006 with alcolocks – in general approximately 15% of the vehicles contracted by Schenker AB in Sweden are equipped with alcolocks – we also carry out random alcohol checks at our own terminals.

### 2. Can you explain how your alcolocks programme works?

What motivated us to get started is that we felt this is a good way to ensure that heavy goods vehicles are driven by sober drivers. At first there were discussions about the extra time it would take to start the vehicle, but this concern has faded away. Our experience has been very positive and the alcolocks seem to function very well so far, we haven't had any technical difficulties reported yet.

### 3. What is the procedure if you identify a drunk driver?

The procedure is to detain a person suspected of having consumed alcohol and to call the local police to immediately address the situation (and the police can perform an alcohol test). Depending on the result, contact is then taken with the haulage company (the employer of the driver) and the situation is discussed – both the driver's situation and vehicle/cargo must be handled in the best possible way – afterwards a follow-up talk is held between the haulage company and the local branch manager.

### 4. Would you like to see further steps from the Swedish or other governments in the prevention of drink driving?

Additional financial resources for the traffic police to carry out more frequent controls along the roads probably would have a positive effect.

### Specific area: Speed

#### 1. What are the main elements of your company's speed management policy?

Simple: no excessive speeding and drivers should always adapt the speed to current traffic / road conditions. Through SRA we have learnt that speed is the single most important factor when it comes to the outcome of an accident.

Our own haulage company Schenker Åkeri AB, has seen to it that the cruise control systems in vehicles cannot be set above 80 km/h, whereas the speed limiters are set at 85 km/h. The legal speed limit for heavy vehicle combinations (i.e. truck or van towing a trailer) is 80 km/h. However a van or a truck not towing a trailer may drive 90 km/h. The regular speed limit on the roads for other vehicles can be 90, 110 or 120 km/h.

Companies commonly set their speed limiters at 85 or 90 – this to give the vehicles some margin when overtaking another vehicle or in a hilly slope. We take pride in setting our limiters at 85 and not letting drivers set cruise controls at more than 80. Thus the truck/van when not towing a trailer cannot go up to 90 km/h even if allowed.

#### 2. How do you explain to your drivers the importance of driving at appropriate speed?

To change the attitude towards speeding is difficult. We regularly inform our drivers about road safety and consequences of speeding on our website where we also have an interactive training program on road safety for our drivers.

#### 3. Do you do any checks to enforce that recommendation? If yes how?

In the past we have carried out checks of vehicles

carrying the Schenker logotype with the help of the Swedish National Society for Road Safety (NTF). Now we receive information via the SRA twice a year, they carry speed measurements on road segments with the following speed limits: 50 km/h, 70 km/h, 90 km/h. What comes out from their reports is that we still do have a problem with speeding on segments with the lowest speed limits. The lesson we have learnt is that it takes a lot longer to reach the goal of absolutely no excessive speeding than we had foreseen in the year 2004.

#### 4. Would you like to see further steps from the Swedish or other governments in the prevention of speeding?

Here too, additional financial resources for the traffic police to carry out more frequent controls along the roads would probably have an effect.

### Specific area: Seat Belts

#### 1. What are the main elements of your company's seat belts policy?

Again, all our drivers should comply with the law and wear their seat belts at all times. At present approximately 60% of the vehicles are equipped with seat belt reminders, and this will grow over time.

#### 2. What is the procedure if you identify drivers not using their seat belt?

We inform their employer – that is to say we inform the haulage company in question – about what has happened and ask them to remind the driver of our rules. We then ask the haulage company for feedback.



## Other areas

1. Are there any other sources of collisions / injuries affecting your company? If yes how do you tackle them or plan to?

There have been a number of so called tilting accidents in Sweden and in the area of Gothenburg in particular. The regional SRA formed a group which looked into possible causes. One result of this group meetings was new road signs warning heavy trucks about sharp turns; and at Schenker we have issued a special warning when it comes to uneven distribution of goods/cargo between the lorry and the trailer. An empty lorry carrying a fully loaded trailer is a combination which must be driven with extra care and lower speed.

2. Do you foresee actions to tackle risk factors that are more difficult to detect (for example regarding driver's fitness to drive: fatigue/ prescription drugs/ health problems...)?

We have no immediate plans – but there is an active work process going on, and we hope to be ready for such future challenges.

3. Are there any other particular in-vehicle safety equipment that you have fitted your vehicles with or wish to fit them with?

We have recently equipped our domestic vehicles with new hand computers for scanning cargo - and a so called black box for recording fuel consumption and speed is an additional choice made by many of our haulage companies.

4. How does your route planning take road safety into consideration?

The schedules are set in collaboration between Schenker and the haulage companies in question

to ensure that there is enough time to carry out the assignments. In that sense delivery schedules do not pressure drivers to speed.

ETSC would like to thank DB Schenker for their contribution. Questions regarding DB Schenker can be directed to Ms. Monica Jadsen Holm

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# "PRAISE": Preventing Road Accidents and Injuries for the Safety of Employees

February  
**2010**  
Report  
**2**

## Fit for Road Safety: From Risk Assessment to Training

### ETSC PRAISE Project

PRAISE is a project co-funded by the European Commission and implemented by ETSC on Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE). The project aims to advance work-related Road Safety Management and provide the know-how to employers who have to take on that challenge. It also aims to present the work-related road safety standards of EU Member States and carry out advocacy work at the EU level: work-related road safety is an area of road safety policy that clearly needs renewed political commitment.

### Introduction

This second thematic report aims to present how driver risk assessment and training can improve work related road safety. This report aims to address all employers managing all types of vehicle from public authorities providing school transport, small two car delivery companies to large international companies

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and organisations. The scope of this report covers both fleet and grey fleet (i.e.: private vehicles used for work-related purposes) drivers and riders, from all vehicle classes: truck, bus, van, car and Powered Two Wheeler.

This Thematic Report looks at risk assessment as a basis for training. It is in four sections. The first section presents what risk assessment is in the occupational road safety context whilst making reference to EU legislation. It also presents the business case behind training in the workplace, and what makes a safe fleet presenting how training should target the different levels of driver behaviour according to the GDE (Goals for Driver Education) Matrix. The second section looks at the area of driver training which is covered by new EU Legislation: the training of bus and truck drivers in the EU. It presents the legislation itself with some examples of how it has been implemented in the Member States and some initial feedback from surveys on how it has been received. The third section looks at driver and rider training of other road users including vans and powered two wheelers. It presents relevant EU legislation and gives some examples of best practice from the Member State level. It also presents the idea of setting up an EU Quality Labelling Scheme for Driver Training as suggested by the EU Advanced project (2002). The fourth and final section looks at employer level initiatives to train drivers with some examples of best practice. It also includes some advice to employers such as a checklist for employers to select trainers. The Thematic Report also elaborates recommendations to the EU, National level and employers on improving driver risk assessment and training with the aim of reducing road deaths in the EU.

Drivers are only one element of an organisation's road safety programme, that should also focus on issues such as management culture, vehicles, journeys and safety of sites (see Haddon Matrix below). Demand for post-licence driver training has grown markedly over the years (Advanced, 2002). Undoubtedly driver training can be an important tool to reduce work-related road risk. However, much care should be given by employers in identifying whether driver training is a tool that suits their needs, and when it is the case which type of training they should opt for.

There is much debate about the value of in-vehicle driver training as a road safety (and particularly a work-related

road safety) improvement countermeasure. The classical criticism is the argument that many driver-training courses (often delivered by former racing icons, police or military personnel) focus on drivers' abilities to handle a vehicle in an emergency. However, in-vehicle-skills-based driver training is only one type of training, and research suggests that driving is about more than just skills. Health, well-being, lifestyle, attitude, knowledge, hazard perception, attention to detail, hand eye co-ordination, concentration, anticipation and observation are all important (Murray, 2009). Exactly these factors affecting safety should also form part of an employer's culture to promote work related road safety. Great care should therefore be taken into identifying programmes that are not only 'skid courses', but in which driving skills are part of an overall package that also trains drivers to be aware of risks and how to avoid risky situations.

Finally, it should also be borne in mind that driver training is of course intended as a mean to reduce collisions and casualties, but it also has other goals such as mediating more general responsibility, generating interest in safety issues, team-building, quality assurance, and preparing positive attitude to « harder » safety measures.

## Part 1: Driver Training in the work context

### Risk Assessment

In accordance with Framework Directive 89/391/EEC, employers shall, taking into account the nature of the activities of the enterprise and/or establishment, evaluate the risks to the safety and health of workers. This first section gives an overview of what makes good training with links to different theoretical frameworks with practical applications. It includes the importance of risk assessment as a starting point. Subsequent to this evaluation the employer must implement the resulting preventive and protection measures, in particular the training needs required to the situation. Overall, it is important for organisations considering driver training to have an effective risk assessment-led process. There is a requirement for compulsory training on safety and health issues (Article 12 of Framework Directive 89/391/EEC). Whatever type and level of training is chosen, it should always be based on a needs analysis. Typically

1 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31989L0391:EN:HTML>

organisations tend to have a reactive approach following an increase in collisions demonstrated by insurance data, their own reported collision data, or telemetry. However, an effective risk assessment should also involve participants in assessing their own needs, as Framework Directive 89/391/EEC expressly requires employers to consult workers and/or their representatives and allow them to take part in discussions on all questions relating to safety and health at work. Proactive organisations consult their drivers from the outset to know whether they feel they ought to receive training, and what their training requirements are. The outcomes should be fed back to operational managers and drivers through discussion. This can take place within workshops, toolbox chats, debriefs, intranets, notice boards, newsletters and with the support of handbooks.

A screening process should also be undertaken to determine which drivers need, apart from the compulsory safety and health training, to undergo specific and target training. This can be done for example by monitoring excessive fuel consumption, excessive tyre usage, collisions or infringements.

Murray & Dubens (2001) and Murray (2004) suggested the following 6 step approach to implement a driver assessment, monitoring and improvement program which has been adapted to reflect the legal requirements under the Directive 89/391/EEC:

1. Review the existing road safety system in the organisation using a detailed framework such as the Haddon Matrix, a fleet gap analysis or the forthcoming ISO39001. This should also be in line with the general principles of prevention as set out in Directive 89/391/EEC Article 6.3.
2. As a result of the assessment of the occupational risks, managers, supervisors, driver assessors, work schedulers, shop stewards and any other potential users must undertake the assessment themselves including assessing the tasks they must carry out as well as the skills they possess. This shows their commitment to safe driving and helps to sell the concept to the rest of the workforce, as well as learning how to use the system and the data outputs from it. Actually this phase should be more than just “showing their commitments”. The assessment should contain also “organisational level” as described later. This organisational level is the most important one in safety as also set out in Directive 89/391/EEC Article 6.3a.

3. All existing drivers should then undertake the assessment again covering their tasks, possibly at one site initially, to build up a benchmarking database of existing company norms and standards.

4. The output must be used to identify the training needs of existing staff and set appropriate targets for all new drivers to achieve (Article 12 of 89/391/EEC Directive). For example in a case using web-based assessment of the participant drivers risk exposure, attitude, behaviour, knowledge and hazard recognition, drivers obtaining >80% are congratulated, those scoring 60-80% receive a ‘web-based’ training package and those with <60% take an immediate on-road assessment.

5. Utilise the assessment process for a range of pre-employment, current staff and other purposes (Article 12 of 89/391/EEC Directive).

6. Reassess to identify and evaluate improvements as per Directive 89/391/EEC Article 12. Users should be aware of any potential order or familiarity effects. It is also common for ‘gossip’ about the correct answers and how to cheat the system to spread quickly.

The Haddon Matrix is particularly useful as a framework for undertaking an overall review of the organisational safety context into which the driver assessment, monitoring and improvement program should fit. Haddon provides an all-encompassing pre-crash, at-scene and post-crash systems-based framework for fleet safety. As well as classifying improvement interventions to be piloted, implemented and embedded, it can be used as a gap analysis and investigation tool by asking: ‘Do we have the following in place?’ for each of the statements in the Matrix. ‘No’ responses indicate the gaps in the fleet safety system, some of which can be addressed by training (Murray et al 2009a).

The starting point lies firmly at the top of the Management culture column of the matrix, as follows:

1. Identify, obtain and analyse available data (e.g. insurance, licence & telemetry) on the extent of the problem.
2. Use this to make a business case to relevant senior managers in the organisation.
3. Focus on the other areas shown under Management culture first to ensure appropriate systems are in place.

	Management Culture	Journey	Road / Site	People - Drivers & Managers	Vehicle	External/ Societal/ Community/ Brand
Pre-Collision or Pre-Drive	<ul style="list-style-type: none"> <li>-Business case</li> <li>-Legal compliance</li> <li>-Safety audit, claims analysis &amp; focus group discussions</li> <li>-Benchmarking</li> <li>-Board level champion</li> <li>-Pilot studies &amp; trials</li> <li>-Goals, policies &amp; procedures</li> <li>-Safety culture / climate</li> <li>-Management structure</li> <li>-Fleet safety committee</li> <li>-Safety leadership by example and commitment</li> <li>-Communications program</li> <li>-Contractor standards</li> <li>-Grey fleet (own vehicle) policy</li> </ul>	<ul style="list-style-type: none"> <li>-Travel survey</li> <li>-Travel policy</li> <li>-Purpose</li> <li>-Need to travel</li> <li>-Modal choice</li> <li>-Journey planning and route selection</li> <li>-Route risk assessment</li> <li>-Journey scheduling</li> <li>-Emergency plan</li> <li>-Shifts / working time</li> <li>-Fatigue management</li> </ul>	<ul style="list-style-type: none"> <li>-Risk assessment</li> <li>-Observation</li> <li>-Guidelines &amp; rules</li> <li>-Site layouts &amp; signs</li> <li>-Work permits</li> <li>-Delivery &amp; collection procedures</li> <li>-Road improvement</li> <li>-Black-spot mapping and hazard assessments</li> <li>-Engage local and national agencies</li> </ul>	<ul style="list-style-type: none"> <li>-Select</li> <li>-Recruit</li> <li>-Contract</li> <li>-Induct</li> <li>-Licensed &amp; qualified</li> <li>-Handbook</li> <li>-Risk assess</li> <li>-Train</li> <li>-Work instructions</li> <li>-Engage &amp; encourage</li> <li>-Equip e.g. high viz</li> <li>-Communicate</li> <li>-Driving pledge/ Code of Conduct/ Risk Foundation</li> <li>-Health &amp; wellbeing</li> <li>-Monitor</li> <li>-Correct</li> </ul>	<ul style="list-style-type: none"> <li>-Risk assessment</li> <li>-Selection</li> <li>-Specification</li> <li>-Active and passive safety features</li> <li>-Standards</li> <li>-Servicing</li> <li>-Maintenance</li> <li>-Checking</li> <li>-Use policy and legal compliance e.g. loading</li> <li>-Mobile communication and navigation policy</li> <li>-Telematics to monitor</li> <li>-Wear and tear policy</li> <li>-Grey fleet standards</li> </ul>	<ul style="list-style-type: none"> <li>-Regulator/ policy engagement</li> <li>-Insurer engagement</li> <li>-CSR</li> <li>-External benchmarking</li> <li>-External communications</li> <li>-Family members program</li> <li>-Community involvement</li> <li>-Engaging other road users</li> <li>-Road safety weeks / days</li> <li>-Safety / ECO groups</li> <li>-European Road Safety Charter</li> <li>-Road safety conference presentations</li> <li>-Media / outreach / PR</li> <li>-Safety &amp; environmental achievement awards</li> </ul>
At Scene	<ul style="list-style-type: none"> <li>-Emergency support to driver</li> </ul>	<ul style="list-style-type: none"> <li>-Engage local investigators</li> </ul>	<ul style="list-style-type: none"> <li>-Manage scene</li> </ul>	<ul style="list-style-type: none"> <li>-Known process and 'crash pack / bumpcard' to manage scene</li> </ul>	<ul style="list-style-type: none"> <li>-Reactive safety features</li> <li>-Crashworthy</li> <li>-Telemetry data capture</li> </ul>	<ul style="list-style-type: none"> <li>-Escalation process</li> </ul>

	Management Culture	Journey	Road / Site	People - Drivers & Managers	Vehicle	External/ Societal/ Community/ Brand
Post-Collision	<ul style="list-style-type: none"> <li>-Policy and process to report, record &amp; investigate incidents</li> <li>-Change management process</li> <li>-Ongoing claims data analysis</li> <li>-Data warehousing &amp; linkages</li> <li>-Evaluation, KPI benchmarking &amp; program development</li> </ul>	<ul style="list-style-type: none"> <li>-Debrief and review</li> <li>-Review journey elements of collision data</li> <li>-Ongoing journey management review</li> </ul>	<ul style="list-style-type: none"> <li>-Investigate and improve</li> <li>-Review site / road elements of collision data</li> </ul>	<ul style="list-style-type: none"> <li>-Reporting and investigation process</li> <li>-Driver debrief and corrective action</li> <li>-Review people elements of collision data</li> <li>-Counselling, trauma management &amp; support</li> <li>-Reassess / train</li> </ul>	<ul style="list-style-type: none"> <li>-Strong open able doors</li> <li>-Investigate telemetry data</li> <li>-Vehicle inspection &amp; repair</li> <li>-Review vehicle elements of collision data</li> <li>-Review vehicle selection &amp; use</li> </ul>	<ul style="list-style-type: none"> <li>- Manage reputation and community learning process</li> </ul>

Murray et al (2009b) provides a good practice example of how one organisation used such an approach to implement its driver risk assessment, monitoring and improvement program as one element of its fleet safety system. Darby et al (2009) provide another detailed case, based on a driver risk assessment initiative involving 26,000 drivers.

The freely available, UK Department of Transport supported, 10 question fleet gap analysis on the Fleet Safety Benchmarking project website at [www.fleetsafetybenchmarking.net](http://www.fleetsafetybenchmarking.net) is also a good free resource for undertaking the initial review of an organisation fleet safety.

### Business case

Quantifiable results are not always possible (e.g. small driver population). However, as much as possible driver training in the workplace should be conducted if there is a clear business case for it (i.e.: it will lead to quantifiable reductions in collisions and casualties). Each training course considered needs to be backed up by a detailed

investment-based business case, and linked to the risks that have been identified. This should be done by using a model of collisions' costs. Collisions most often have financial implications on a business that stretch well beyond reported costs (for a model of collision costs see ETSC 2009 PRAISE Thematic report 1).

Once a training programme has been identified as likely to provide positive results, a pilot study at one site or with one group of drivers (depending on the size of the organisation this might not always be possible) helps to evaluate the usefulness, cost effectiveness and implementation of the program before deciding to proceed with its full implementation.

In fact, from an academic point of view, the literature on driver training in the workplace draws rather mitigated conclusions. A number of studies have evaluated the effects of formal training of professional drivers, including people who drive a great deal as part of their work (for example, craftsmen). The measures reviewed include: courses in defensive driving, skid training and more stringent driving tests. There is no scientific evidence in the literature in the form of scientific controlled studies

that conventional fleet driver training is effective in reducing crashes (Keigan et al 1999 in Elvik et al 2004), despite the strong belief in the effectiveness of driver training courses by those involved (Hawarth et al 2000 in Elvik et al 2004). However, formal defensive driver training for professional drivers, taught at the workplace, combined in larger companies with motivation and incentive systems for crash-free driving, has been found to reduce the crash rate by around 20%. Other types

of instruction for professional drivers, including skid training, both amongst ambulance drivers and drivers of lorries and articulated lorries have been found to increase the crash rate (Elvik et al 2004). It should be emphasised that these studies should not be interpreted as criticism towards training overall, but rather suggest that simple skill-based training schemes do not suffice, and that training should always be integrated into a wider employer safety strategy.

### Effects of training and testing professional drivers on the number of accidents (Elvik et al 2004)

Percentage change in the number of accidents			
Accident severity	Type of accident affected	Best estimate	95% confidence interval
<b>Course in defensive driving for experienced drivers (accidents per km driven)</b>			
Unspecified (all)	All types of accidents	-20	(-33; -5)
<b>Skid training for ambulance drivers (accidents per driver)</b>			
Unspecified (all)	Accidents in icy conditions	+45	(-35; +220)
<b>Skid training for drivers of heavy vehicles (accidents per km driven)</b>			
Unspecified (all)	Accidents in icy conditions	+22	(+9; +36)
<b>More stringent driving tests for drivers of heavy vehicles (total accident figure)</b>			
Injury accidents	All types of injury	+5	(+4; +6)

A Swedish study of countermeasures implemented by Televerket also showed statistically significant reductions of crash risks in groups which had participated in defensive driver training accompanied by group discussions [Gregersen et al 1996].

Such mitigated results clearly show that choosing an efficient driver training program is no easy business, and particular attention should be given to which type of course is chosen, based on what one's needs are.

### The process:

So what should be the best process for an employer who wishes to embark on a fleet training program? Murray (2009) distinguishes the following steps:

- A problem or level of risk is identified, either proactively through a fleet safety review or gap analysis like that described in the Haddon Matrix above, or more typically through a series of negative symptoms – such as a high cost insurance claim, road death or an increasing amount of vehicle damage. Typically this leads proactive individuals in organisations to make a business case to develop a safety program, including driver risk assessment, monitoring and improvement.
- If the risks are identified as being people related, a training needs analysis should be undertaken to identify causes and any training issues. Detailed claims analysis, driver assessment, use of vehicle telematics and safety audits are all effective tools to identify training needs.
- The required type of training is determined, varying from totally in-vehicle to totally out of vehicle based options.



- An in-house or external trainer is chosen, depending on the situation and requirements.
- A pilot study at one site or with one group of drivers helps to evaluate the usefulness, cost effectiveness and implementation of the program.
- Once the training has been undertaken it is important to evaluate its effectiveness.

### What makes a safe fleet: “A safe driver in a safe organisation”

There is a plethora of training programmes available on the market and, as we have already touched upon, a first defining feature of training is that there are a number of environments in which it can take place: the classroom, the track, public roads, or a mixture of those. The matter is not merely to prefer one type of course over another but to understand the specific features of these different types of courses and the needs that they address. The training environment will dictate to a large extent the level of individual attention given to participants; the possibility to interact with other participants; and the flexibility to respond to individual needs. It is very important that employers understand the different types of training that are on offer, and are therefore able to assess whether or not a certain type of training will respond to their demand.

Research in the field of driver training underlines four hierarchical levels permeating driving behaviour, and the need to design training to address each level. These

are: basic vehicle maneuvering (knowing how to start; change gear, etc.); mastery of traffic situations (being able to adapt one’s behaviour in accordance to the traffic situation, e.g. at junctions, when in the vicinity of vulnerable users, etc.); the context of driving (this involves the goals behind driving and the context of driving including the why, when, where, and with whom the driving is performed: day-time; night-time; rush-hour; driving under fatigue, alcohol etc.); and goals for life and skills for living (this refers to personal motives and tendencies in a broader perspective). The two last and highest levels generally tend to be neglected, but should be an integral part of good training as they are very important for risk awareness as opposed to merely improving driving skills, which is the content of the two first and lowest levels (Advanced, 2002).

These four levels can best be visualised in the GDE matrix (Goals for Driver Education) that is a major outcome of the EU-project “Gadget”. A fifth level has also been included in the latest version of the matrix, that includes not individual characteristics of the driver but rather the organisational setting within which the driving takes place. There are two versions of the latest model: GDE-5PRO (PRO for professionals and their organisational environment) and GDE-5SOC (for private drivers and their social environment) that help describe the different situation of a professional driver and a private driver (Keskinen, Peräaho & Laapotti, 2010).

#### GDE-5 PRO (Keskinen, Peräaho & Laapotti, 2010)

Level/Dimension	Knowledge and skills	Risk increasing factors	Self-evaluation
Level V Company awareness, characteristics, safety situation (organisational level)	In logistics, safety systems, management, economy, safety culture, values	Production/protection, feedback system, company’s motivational system	Company’s / organisation’s awareness of safety situation and its development
Level IV Goals for life and skills for living	Lifestyle, age, group, culture, social position etc. vs driving behaviour	Sensation seeking, group norms, peer pressure	Introspective competence, own preconditions, impulse control

Level/Dimension	Knowledge and skills	Risk increasing factors	Self-evaluation
Level III Goals and context of driving	Modal choice, choice of time, role of motives, route planning	Alcohol, fatigue, low friction, rush hours, young passengers	Own motives influencing choices, self-critical thinking
Level II Driving in traffic	Traffic rules, cooperation, hazard perception, Automatisation	Disobeying rules, tailgating, low friction, vulnerable road users	Calibration of driving skills, own driving style
Level I Vehicle control	Car functioning, protection systems, vehicle control, physical laws	No seatbelts, breakdown of vehicle system, worn-out tyres	Calibration of car control skills

Driver training usually focuses on levels 1 and 2, however a good driver is not only one that is skilled but also one that is aware of risks and his own individual abilities and characteristics. The hierarchy was expanded into a matrix in order to cover these different dimensions, and in addition to the four levels, three crucial dimensions were added: knowledge and skills; risk increasing factors; and self-evaluation. The first column describes knowledge and skills needed under normal circumstances for each level: for the lowest levels this equates to knowing how to maneuver the car and how to behave in traffic and following rules; whereas on the highest levels this has more to do with planning trips. The second-column is about the risk-increasing factors at every level of driving. On the highest levels this includes risky driving in darkness, on low friction, among vulnerable users, excessive speeding, mental overload, etc. It is also related to dangerous motives for driving and risk-increasing aspects of lifestyle and personality. The third column is about how the driver assesses his or her situation on the different levels. This is important for the driver to calibrate his self-perceived skills to correspond to his/her actual skills; and it also plays an important role in shaping the driver's abilities to make decisions about trips and in life in general.

When considering safety issues of a whole organisation, the fifth level is necessary. A private driver is independently selecting when, where, with whom and in what schedule they drive, but a professional driver is accomplishing tasks that they have from their organisation. The organisation sets the prerequisites for the task and also for the safety, providing the framework or the degrees of freedom within which the individual driver has to operate. The organisation

is thereby limiting the driver's own set of choices, which, in the worst case, can be counterproductive to the driver's own safety orientation. It is not often that a professional driver can select the timetable on their route nor are they able to change the route and they also drive the vehicles which belong to the organisation's fleet.

Organisations have their own cultures, based on values and these cultures are affecting organisational safety by setting goals, standards, norms and in many ways giving and rewarding or restricting possibilities for safety increasing behaviour. Knowledge and skills in an organisational setting mean the global way how the organisation handles safety issues. Risk increasing factors on company level are connected to low level of knowledge and skills but also to the company climate where production, which is necessary for safety, of course, runs over the protection, like Reason (1997) noted. An organisation's self-evaluation concerns mainly the control of the whole system: does it function in an appropriate way? One important element concerning this organisational level is that there must be a well functioning feedback system from driver level to company level and the company has to be interested in getting feedback in a real way.

The production vs. protection problem can be seen in an even wider environment than on the company/organisation level. Legislation and values behind legislation give a degree of freedom to companies/organisations when they are running their business under the pressure of economic (production) and safety (protection) factors. This society and legislation level could be described as the sixth level in the

hierarchy concerning driving (Keskinen, Peräaho & Laapotti, 2010). As this level, containing legislation and its surveillance, is affecting every transport company in a country or in the whole EU, it is a most important factor in safety work. Legislation should be based at least as much on ensuring correct protection as on delivering production.

In practice this matrix is of very important use both for providers of training courses but also to inform those who seek to identify good courses available on the market. It should therefore provide a theoretical background to shape both the demand for and supply of training courses.

The Advanced project, concerned with post-licence training, issued a number of recommendations (2002), including the following: course content should be based on the different levels of driver behaviour; there should be a balance between skills and risk awareness exercises, the training environment; and overconfidence among participants should be recognised and discouraged. Advanced also recommends periodic, continuous training (training shouldn't be a one off). Employers should overcome the difficulty of keeping projects going through the "calendar theory of motivation" like Thierry (2003) described the everyday situation in any organisation. It is easy to start different kinds of projects to increase e.g. safety, but it is extremely difficult to keep them going on and make them a functioning part of work. Often much emphasis is put on starting the project but too little is done to ensure that the new ways of behaviour have been permanently taken as routines in the organisation. One of the real dangers in one or two day safety courses is, self evidently, that there will be no change in the long run in drivers' behaviour, if there are no follow-up feedback mechanisms on the whole organisation level. This means that there has to be a common agreement of how the safety system of the organisation should work and what the responsibilities of each person are in the system.

One way of trying to make behavioural changes more permanent is to make training more self-controlled, self-activated, student centred. This means that, instead of traditional teacher centred teaching methods, it should use coaching type methods to support learning.

## Coaching vs Teaching

An important question for trainers is: do you use coaching techniques or do you tell your clients to do what you think is best? The Advanced project underlines how a participant-centered approach is most likely to bring positive results (Advanced 2002). This is well illustrated by the standard 1:1 trainee-trainer ratio that allows for a very intense learning environment, provided the approach is right. Trainers are too often looking to impose their own perception of matters. Many trainers only think in terms of detecting "errors" and correcting them. It tends to be more constructive to engage with the driver and ask him or her to express his or her experiences, difficulties, needs and work on those together. Constant targeted questioning should encourage the driver to think for himself or herself about his or her behaviour.

Stanton et al. (2007) carried an experiment involving advanced coaching and concluded that drivers in the coaching condition improved markedly. They observed changes in the knowledge used by drivers and the information they attend to, which in turn improves their situational awareness. It also appeared in this experiment that drivers are able to deploy that to carry out more skillful driving behaviours. Finally they observed a favourable change in attitudes regarding external locus of control, with drivers more prone to anticipate hazards as a result. The focus in coaching is as much about changing drivers' minds as it is about improving their technical skills.

The European project HERMES "High Impact approach for Enhancing Road safety through More Effective communication Skills for driving instructors" aims at creating an easy-to-use training package on teacher-trainee communication in classrooms, in cars and on dedicated tracks, based on coaching techniques. <http://www.gutefahrt.at/hermes>

## Training: Safety and Fuel Efficiency Benefits

Finally, one point worth considering is the synergies between training drivers on eco-driving / fuel-efficiency and safe driving. Typically there are a number of training programmes offered that address both eco-driving and safe driving. This is

also reflected in the new Directive for training truck and bus drivers. Examples for this kind of training schemes include courses reviewed in the study “To the Point 3 – studies on drive like a pro – safe driving, both in a professional and a private context” published by the German Road Safety Council, and the German Statutory Accident Insurance. This is also a good way of linking a company’s sustainable development policy and road safety.

The Hamburger Wasserwerke HWW (Water suppliers) carried out a data collection to ascertain whether the fuel saving training served to reduce fuel consumption and if it had an impact on safety. A comparison of the fuel consumption for the time periods before the training and after it showed that fuel consumption had decreased by 6,2 % and that third part liability claims dropped by 21,7 %, whereas own damage claims declined by 34%.

This section has given an overview of steps to risk assessment of drivers and their tasks. It also presented the background to what makes good training including explaining concepts such as training and coaching.

## Part 2: Training for Truck and Bus Drivers

### Overview of EU Level Legislation

Having established some of the background to driver training this next section will focus on driver training in the area where new EU legislation exists namely for bus and truck drivers. It will present the legislation itself, some examples of how it has been implemented in the Member States and some initial feedback from surveys on how it has been received.

### Directive on Initial Qualification and Periodic Driver Training of drivers of certain vehicles (2003/59)

EU professional drivers will now be required to have followed professional training. The Directive on the initial qualification and periodic training of drivers

of certain road vehicles for the carriage of goods or passengers was adopted in 2003. This legislation came into force for bus drivers in autumn 2008 and for truck drivers in autumn 2009. It is hoped that this important milestone in the harmonisation of social aspects in road transport policy will lead to enhanced safety on European roads and that this becomes a part of increased professionalism of this group of workers. It aims to improve road safety and the safety of the driver including operations carried out by the driver when the vehicle is stopped.

Until now very few EU drivers have followed professional competence training. Only some drivers were obliged by EU legislation to follow any training and in most of the Member States only 5 to 10% of professional drivers underwent such training, which was based upon requirements specified in a Directive that dates back to 1976<sup>2</sup>. The vast majority of professional drivers therefore worked solely on the basis of their driving licence.

However, it has now been recognised that the demands on professional drivers today call for both basic and periodic training. Whereas the legislation on driver licensing concentrates on basic driving skills, the Directive has a much broader perspective and the syllabus covers elements to improve road safety in general, as well as safety during stops and also reducing CO2 emissions through a special focus on reduction of fuel consumption. It also covers other areas such as how to act in an emergency situation. The Annex of the Directive goes into more detail on the topics to be included in the curriculum of the Directive. This includes the objective to make drivers aware of the risks of the road and of accidents at work. Member States will issue the driver with a certificate of professional competence, referred to as ‘CPC’, certifying his or her initial qualification or periodic training.

These skills and knowledge will be kept up to date through periodic training. Periodic training is designed to complement the individual driver’s work and be relevant to their everyday job. This will allow drivers to keep up with ever changing regulations and benefit from the state of the art in training throughout their whole career.

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<sup>2</sup> Council Directive 76/914/EEC of 16 December 1976 on the minimum level of training of some road transport drivers, OJ L 357 of 29.12.1976.

## Member State Implementation of the Directive

This next section will present the different approach to implementing the Directive as well as examples of how two Member States have chosen to implement the Directive. It also gives first results from two organisations who have surveyed the first steps to put the Directive in place.

The Directive provides for two options for initial qualification and requires the systematic periodic training be put in place for all professional drivers. For the initial qualification Member States can combine both course attendance and a test or introduce an option only involving tests on theory and practice. Some Member States took great trouble to consult with industry to consider which option would suit them best and also to encourage high levels of compliance with the training take up.

**Table of EU MSs taking Training or Testing Approach or a mixture**

Training Approach	Testing Approach	Training and Testing
Norway, Luxembourg, Sweden, Poland, Switzerland, Estonia, France, Finland, Latvia, Czech Republic, Slovakia, Bulgaria, Greece	Netherlands, UK, Malta, Belgium, Ireland, Portugal, Spain, Austria, Hungary, Romania	Germany, Lithuania, Slovenia

The Netherlands have chosen the testing approach, this is because of the right to freedom of education included in its constitution. The Netherlands already have a mandatory system of certificates of professional competence. The new Directive will thus build on existing structures and processes. Another approach is that taken by France which introduced a system of compulsory training (basic and periodic) which was extended to include all professional drivers in 1998. The initial training takes four weeks and includes road safety on the curriculum. The periodic training is a 3 day programme held once every 5 years (CIECA Workshop report 2006).

The Irish Road Safety Authority (RSA) is responsible for the implementation of the Driver CPC Directive in Ireland and has produced a periodic training curriculum for all professional bus and truck drivers which was developed in line with the EU Directive and in consultation with the industry<sup>3</sup>. In order to be in a position to facilitate Driver CPC training, interested training providers apply to the Road Safety Authority for approval and this is subject to a rigorous process assessing the quality and standards of their facilities and trainers. There are in excess of 200 approved

training centres located around Ireland; this ensures competition in the marketplace for good standards and costs of training. All new bus and truck drivers will have to pass 2 two hour theory tests and a 30 minute practical test as well as the current driving test in order to obtain Driver CPC. The theory tests and the practical test are developed to ensure the applicant has a comprehensive knowledge of the Rules of the Road and of the skills and professionalism to be a full time bus/truck driver. The RSA has developed a number of information documents including a 'Frequently Asked Questions' document to inform drivers and employers of all aspects of the Driver CPC process. The RSA have also engaged with the training organisations and have put a process in place whereby driver feedback is collected at each training course, the main purpose of this is to assess how the training can be improved. One issue of concern is the development of training materials that are easily understood and relevant to the driver. The RSA believes that the Driver CPC will lead to a change in the perception that driving professionally can be achieved by a once off test. It will now be seen as a profession which has continuous training and development of skills as a requirement.

<sup>3</sup> [http://www.rsa.ie/SERVICES/RSA\\_Services/CPC\\_Unit.html](http://www.rsa.ie/SERVICES/RSA_Services/CPC_Unit.html)

## Results of first Feedback on Implementation of the Directive

The Information and Initiative Days (I&I Days) recently completed a survey on the Directive 2003/59. This is a joint initiative of UITP<sup>4</sup> (represented by UITP Euro Team) and the European Transport Workers' Federation (ETF), led by AFT<sup>5</sup>. The survey looked at training of bus and truck drivers in the urban context. The survey of employers, employees and authorities looked at the impact of training on the quality of work, driver's occupational qualifications and the policies of human resources. The first responses from the side of the employers are that the Directive will have a very positive effect on reducing incidents and accidents (by 71%). A same high level, 71%, said that there will also be an increase in the level of service. Another positive impact, 63% said that they see a decrease in the fuel consumption. One key finding of the survey was that the Directive will lead to higher professionalism of the Training Centres. Most of those surveyed agreed that there should be some national level regulation monitoring the quality of the training centres.

Eurotra, the European Transport Training Organisation, acting as the umbrella association covering the major European transport training institutes ran a two year project called EU Safe Driver. One of the key outputs was a "Handbook on Initial Qualifications and Periodic Training of Professional Drivers"<sup>6</sup>. This gives common recommendations for training, minimum qualification and training requirements. At an expert forum held in the autumn of 2009 Eurotra concluded that so far the level of implementation of the Directive in the Member States is enormously diverse. Different measures and developments are being put in place by the authorities. These differences arise first of all from the different historic situation in countries in delivering training programme. Other differences are due to different socio-economic situations. Some countries support the training activities via national financial compensatory systems. The second main conclusion made at the Expert Forum is the strong concern of almost all Eurotra representatives to face a capacity issue in the field of the availability of the necessary training infrastructure, training facilities and trainers at the end of the transition period ending in most of the Member States in 2015

and 2016.

They also propose the idea that information campaigns could be launched to raise awareness within all actors demonstrating the advantages of qualified drivers based on a high level of training leading to less damage in handling goods, less accidents, less cargo loss, less fuel consumption leading to better cost control and/or cost reduction. The higher professional qualification is also likely to lead to better recognition of the profession and lead to a positive overall social impact.

## EU Respect Project – Testing the new Directive for Truck Drivers

The objectives of the RESPECT project (managed by NEA Transport Research and Training, the Netherlands) were to set up a 3-day education programme for truck drivers with the aim of reducing the fuel consumption of the drivers and reduce the accident/data rate. This programme includes simulator training, "real" truck driving and classroom training on theory. Agency for Transport, Training and Logistics in France (AFT-IFTIM) was one of the organisations in the RESPECT project and 300 professional drivers in France were involved in the project and completed a questionnaire providing feedback about the education programme developed in RESPECT. The questionnaire covered topics such as general opinion, most useful and least useful parts of the programme, structure of the theory programme, structure of the practical programme, use of the simulator, value of practical on-road driving, etc. The most notable improvements in the skills of the professional drivers who completed the RESPECT programme were to be found in reduced fuel consumption, increased road safety, reduction in emitted pollutants, and increased professionalism.

## CIECA Risk Awareness Database for Training

The Risk Awareness Database was developed as part of the Advanced project (2002). This was in reaction to the limited amount of quality risk awareness exercises used in post-licence training. The database is seen as a first step on an international level towards encouraging

4 UITP is international organisation for public transport authorities and operators, policy decision-makers, scientific institutes and the public transport supply and service industry <http://www.uitp.org/>

5 Association pour le développement de la Formation professionnelle dans le Transport, was created in 1957 by the French transport trade organisations. <http://www.aft-iftim.com/infos-secteur/>

6 In English, Danish, Polish, German, Swedish, Czech and French

more focus on risk awareness in post-licence courses. The examples on site have all been provided by course providers and can be used or adapted.

## EU Level Recommendations

### European Commission:

- Carefully monitor the implementation of the Directive and offer support to Member States in implementation with the aim of reaching high common standards in all Member States.
- Aspects concerning management, administration and policy are not yet fully developed in each Member State in the educational and training sector. The European Commission could create a platform to exchange information and experiences in that field in view of the development of “best practice” guidelines<sup>7</sup>.
- Should act as a catalyst for the enhancement of an appropriate “training” infrastructure including qualification of trainers and content of the training.

## National Level Recommendations

### Member States should:

- Be able to guarantee the quality of both the initial and periodic training of professional drivers of trucks and buses in their countries
- Inform drivers and employers about the new Directive by also setting up websites with information.
- Set up financial compensation systems to fund training.
- Develop the capacity of training institutions to deliver training for professional drivers.
- Encourage trainers to include risk awareness in their training by, for example, making use of the CIECA risk awareness training database.
- Ensure enforcement of CPC qualification card of drivers will take place.

### Employers Must:

- Make sure that all professional drivers of category C and D have gained their CPC and take part in initial and periodic training.

## Part 3: Training for Professional Drivers of Other Vehicle Classes

This third section will look at driver training of other vehicle classes. Firstly looking at two European Directives that apply to all drivers, then by looking at best practice examples from Member States and employers to set up structures and implement effective driver training to improve road safety. It also presents the idea of setting up an EU Quality Labelling Scheme for Driver Training as suggested by the EU Advanced project (2002).

### EU Legislation

#### Driving Licence Directive (2006/126)

A new EU Driving Licence Directive was adopted in 2006 which brings in new requirements for qualifications and the continuous training for driving examiners. The issuing of new licences will be obligatory as from 2012, since the new directive will apply two years after entry into force, and after that period Member States will have four years to comply with its provisions. Under Article 7 Driving Licences can only be issued to those who have completed training or passed a test of skills and behaviour, or completed a training and passed a test of skills and behaviour.

#### Council Directive on Safety and Health of Workers at Work 89/391/EEC

There is also another relevant Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work already mentioned earlier. This Directive includes under Article 1 general principles concerning the prevention of occupational risks, through also the training of workers. Under Article 6, within the context of their responsibilities, the employer shall take necessary measures for the safety and health protection of workers, including prevention of occupational risks and provision of information and training, as well as provision of the necessary organisation and means. There is a whole Article 12 on the training of workers which states that the employer shall ensure that each worker receives adequate safety and health training, in

particular in the form of information and instructions specific to their workstation or job. This should cover all aspects from time of recruitment or in the event of a transfer or a change of job. Also training should take place in the event of the introduction of new work equipment or a change in equipment, or in the event of the introduction of any new technology. The training shall be adapted to take account of new or changed risks, and repeated periodically if necessary.

As well as the employers, under Article 13 workers also have obligations. Each worker should take care as far as possible of their own safety and health in accordance with their training and the instructions given by their employer. Workers must in particular, in accordance with their training and the instructions given by their employer, make correct use of machinery and transport equipment. Finally, they should also cooperate with the employer to ensure that the working environment and working conditions are safe and pose no risk to safety and health within their field of activity.

## EU Level Recommendation

The EU Should:

- Monitor the implementation of its Directive on safety and health of workers and ensure the proper provision of training by employers and application of the training by the workers themselves. This should also include explicitly tasks such as the use of transport vehicles.

## National Level Recommendations

Member States Should:

- Develop the capacity of training institutions to deliver training for all professional drivers.
- Promote the implementation according to the Directive on health and safety at work of employers delivering adequate training to enable employees to protect the health and safety of its employees.

## Company Recommendations

- Guarantee that training is rooted in the company's health and safety at work culture.
- Comply with the requirements of the Directive on Health and Safety at Work in ensuring that proper training is given linked to the needs of the employees including the use of transport vehicles.

## Drivers and Riders of Vans and Powered Two Wheelers

Apart from the aforementioned parts of relevant legislation there is not yet any specific legislation foreseen at EU level on training of drivers or riders of other vehicles. One next step supported by experts would be the extension of the Council Directive Initial Qualification and Driver Training of drivers of certain vehicles (2003/59) to another group associated with driving for work: van drivers and Powered Two Wheeler drivers.

Formal training and testing of professional drivers is intended to prevent clearly unsuitable drivers from becoming professional drivers and to give professional drivers a lower accident rate than they would have had without formal training and testing. Furthermore it is desirable to aim for a lower accident rate for professional drivers than for other groups of road users (Elvik et al 2004).

The Advanced project reported that over 400,000 drivers took part in continuous driver training throughout Europe in the year 2000 (Advanced 2002). Moreover, demand for post-licence driver training has grown over the last 5-20 years across the European Union. Amongst the various reasons cited, the main explanation for this rise in demand is the growth of fleet driver training. The increase in the provision of company cars over the last few years has led to higher accident and damage claims which company management are at pains to reduce and which their insurance companies are unwilling to support over the long-term. Changes in working practice are also encouraging governments and authorities to consider the company car as an extension of the workplace. Health and safety regulations, in addition to legal concepts such as corporate responsibility, are therefore no longer restricted to the office. Post-licence training varies considerably in popularity from one country to another. Fleet driver training accounts for the vast majority of current post licence training (Advanced 2002).

## Light Commercial Vehicles (Vans)

LCV is the formal term in the European Union for goods vehicles with a Gross Vehicle Mass (GVM) of up to 3.5 tones. There has been a rise in LCVs use in Europe. A large part of this rise is a consequence of the home



delivery sector, which has seen phenomenal growth recently due to internet shopping. There is some evidence on certain behavioral aspects concerning LCV drivers. In Great Britain the DfT's campaign to improve the safety record of this group observes that, in the last 10 years, the number of vans in the UK has increased by around one third and van traffic by 40%. It goes on to note that there are now three million vans on Britain's roads, and the annual volume of new registrations is around 320,000<sup>8</sup>. The SafetyNet project collected information on daytime seat belt wearing rates in light vehicles, distinguishing passenger cars and commercial vans and found a consistent pattern of much lower rates of seatbelt wearing by the drivers and passengers of LCVs.

In GB the examination of the severity of accidents show that LCVs are more likely than other vehicle groups to be involved in fatal and serious accidents. About a quarter of fatalities caused by LCV drivers involve breaking the speed limit; these include cases where the driver is breaking the applicable limit for a vehicle of that class, as well as those ignoring posted speed limits<sup>9</sup>.

In Germany there is a considerable increase in the frequency of registered goods vehicles with a maximum permissible weight less than 7.5 t involvement in collisions since the end of the 80s (Niewöhner 2001). Transporters (box-type trucks) are the majority within this vehicle category. With this background the accident research unit of DEKRA started to study real-world crashes with involved transporters. One of the results of the study is that transporters drive and collide at similar speeds as cars but only 20 % of the transporter drivers wear seat belts.

As in the case of truck and bus drivers training can be appropriate. But only if this is part of an integrated approach to risk assessment by an employer with the aim of improving the safety of their operations.

## UK Best Practice: SAFED for Van Drivers

The UK's Department of Transport has adapted an existing Guide for Safer and Fuel Efficient Driving

(SAFED) to van drivers. The SAFED Handbook aims to outline the elements of Safe and Fuel Efficient Driving training specifically relevant to the driving of vans. It also aims to define the qualifications, skills and experience required by trainers intending to deliver the SAFED training programme to candidate drivers. The Department for Transport also oversees the delivery of the one-day SAFED training course designed to improve the safe and fuel efficient driving techniques of existing van drivers.

The LCV driver is initially assessed by a qualified trainer. Training on best practice in safe and fuel efficient driving techniques is then given. The driver is then reassessed to record improvements in driving technique and where possible actual fuel consumption. The driver is also assessed on performance in safety check and knowledge test exercises as well as the number of faults recorded during the day's practical driving sessions. Successful drivers receive a certificate of achievement.

## Powered Two Wheelers

It is well known that motorcyclists face a much higher risk of being killed than other road users. For the same distance travelled, the risk for riders to be killed in road accidents is on average 16 times the risk of being killed in traffic for car drivers. In 2006 at least 6,200 Powered Two Wheeler (PTW) riders were killed in road crashes in the EU25<sup>10</sup> representing 16% of the total number of road deaths while accounting for only 2% of the total kilometres driven (ETSC PIN 2007). While riding a motorcycle will inevitably carry more risk than driving a car, evidence shows that the implementation of dedicated safety measures can substantially improve PTW safety. The measures should aim at improving the behaviour of motorcyclists, but also the behaviour of other road users and providing a safer environment for PTW riders. The rider's skills, training, experience and attitudes are fundamental to safe motorcycling. A project co-funded by the EU has developed a basic manual for initial rider training that includes hazard awareness and rider attitude and behaviour [www.initialridertraining.eu](http://www.initialridertraining.eu). At present there is very little post licence training within the work context. However general multiphase training does exist and has been introduced for example in Austria [www.kfv.at/departmnet-transport-mobility/safety-measures-in-austria/multi-phase-driving-licence](http://www.kfv.at/departmnet-transport-mobility/safety-measures-in-austria/multi-phase-driving-licence)

<sup>8</sup> DfT, THINK! <http://www.thinkroadsafety.gov.uk/campaigns/drivingforwork/index.htm>

<sup>9</sup> PACTS (2003), Speed Cameras: 10 criticisms and why they are flawed, PACTS & SSI, London, p4

<sup>10</sup> Estimation based on 2006 national data; except GR, SI (2005 data), IT: min. 1000 deaths (based on 2000-2004 data). This report considers GB and not the UK.

One example of post licence training for powered two wheelers in the driving ‘for work’ and ‘to work’ context comes from the UK. BikeSafe-London invites motorcyclists, moped and scooter riders to participate in Rider Skills Days that offer assessment on present skills, and advice to help make their riding in London safer and more enjoyable. As well as professional riding techniques, topics covered include the system of motorcycle control, collision causation factors and security. Research also indicates that motorcyclists and scooter riders are disproportionately represented in serious injury road crashes and within London this is linked significantly to the journey to/from work - a feature not as apparent in the rest of the country. BikeSafe-London has therefore initiated partnerships with a number of forward thinking companies to support them in encouraging and supporting their staff to undertake BikeSafe, and in turn further training, as part of its commitment to ‘Working Together to make London Safer’. The team has in recent months been to train British Airways, Tesco and HSBC staff. Many motor insurance companies acknowledge the value of the scheme and offer a discount on premiums to riders who have completed the programme.

A specific Guidance document has also been produced by the Royal Society for the Prevention of Accidents and the Department for Transport on reducing risk to do with motorcycling for work<sup>11</sup>

## Further Initiatives for all types of drivers

### An EU Quality labeling Scheme for Driver Training

In the absence of government regulation, the Advanced project looked at if a voluntary quality label scheme for post-licence driver training could meet the needs of consumers, course providers and policymakers. In fact, positive and very constructive steps were taken to lay the groundwork for a proposal for a future European Quality Label in this area. Benchmarking is important in this sector due to the almost complete lack of standards for post-licence driver and rider courses across the EU (especially in terms of the instructors). With the exception of the UK, Luxembourg, Finland, Austria and Switzerland there is no legislation regulating post

licence driver training in the EU. Current knowledge on training needs and measures for drivers and riders were then seen as still insufficient to assess what “quality” is in reality (in terms of course content and instructors). However despite some reservations the Advanced Project concluded that a quality scheme would be useful, as long as it does not complicate any efforts to introduce standards at national level (for instance in Germany or the UK) and that its structure allows for ongoing change (research has been limited in this field until now). The project also worked out the principles of a labelling scheme and setting up such an organisation (Advanced 2002).

## National Level Initiatives

At present there are only a few Member States that regulate post licence driver/rider training of other vehicle classes (car/van/PTW) in terms of course content and instructors. Non legislative standards governing this sector range from non-existent to elaborate and are either set internally by driver / rider training companies or by road safety bodies (such as the German Road Safety Council (Advanced 2002).

### Luxembourg

Training is provided for voluntary and company participants at the (track-based) Centre de Formation pour Conducteurs, where Luxembourg’s obligatory 2nd phase course for novice drivers (and riders) is run since 1996. The instructors are the same for both voluntary and obligatory training, meaning that Luxembourg is one of the few countries, alongside Finland, Austria and Switzerland with legally required standards for post-licence instructors.

The Luxembourgish employers association conducted in 2002 a report on accidents at work showing that while such collisions were decreasing, the number of commuting collisions on the roads was on the rise, and that as much as 67% of work related collisions leading to deaths were in traffic. An agreement between a number of partners including the employers association, the insurers association, the labour inspectorate, trade unions, and the national road safety NGO, was therefore reached to launch a campaign called “Trajet: sécurisons-le!” (This would translate into: “let’s make

11 [http://www.bikesafe-london.co.uk/motorcycling\\_through\\_work.pdf](http://www.bikesafe-london.co.uk/motorcycling_through_work.pdf)  
<http://www.bikesafe-london.co.uk/wrrr.htm>

commuting safer"). The campaign, launched in 2003, aims at providing materials to employers to conduct simple training of their employees. The materials prepared for this campaign were fact sheets on 12 topics (one topic per month of the year) including a reminder of the traffic rules, information about the various risk factors (alcohol, speed, not wearing seat belts, mobile phones etc.) but also explanations about certain important laws of physics (such as braking distances), the impact of weather conditions on safety, or how to prepare for long journeys. The materials can be found on [www.trajet.lu](http://www.trajet.lu)

## Portugal

In Portugal in 2000 there were many collisions with buses, coaches and minivans which performed the transport of children groups to school, cultural and leisure activities, sports, and holiday camps. The Association for the Promotion of Child Safety (APSI) launched innovative training courses for drivers, including theory and practice on defensive driving, case simulation and circuit training. Besides the theory on Child Restraint Systems, drivers were given an intensive practical training on how to choose, fit and use them correctly. Courses also include specific norms and safety measures concerning children transport, general road legislation, first aid and acting in case of emergency, practical training to use a fire extinguisher, interpersonal relationship, psychological factors related to the specific transport of children, and at last evaluation of drivers defensive driving and ability to choose places to take and leave children in real traffic situations on public roads.

At the same time APSI tried to persuade the government to publish a law, and raised public awareness on this problem, since a first study, showed that in a period of 18 months (October 1998 to June 2000) there were 19 accidents that caused the death of 8 children and 192 injuries. A specific Law on the group transport of children was published in 2006 obliging 35 hours training courses for drivers, including all the topics mentioned above. A second study with the same methodology to evaluate the number and severity of collisions in the transport of children groups showed that from January 2004 to December 2007 there were 21 accidents that caused the death of 2 children and injuries in 131. This was for a longer period of time (4 years) and there was an important reduction in the

number of accidents, deaths and injuries. These global training courses, in which APSI has already trained more than 600 drivers, have had a very positive impact for the safety of Portuguese children and adolescents as vulnerable road users.

## UK

In the UK demand for post licence training has risen over the last 5-10 years. There are two main reasons for this. Firstly, insurance companies are encouraging companies to send their employees for fleet driver training (Advanced). Secondly, strong UK legislation on Health and Safety at Work such as the first Act Health and Safety at Work 1974 requires the employer to ensure the health and safety of all employees while at work and that others are not put at risk by the employees work related driving activities. The Management of Health and Safety at Work Regulations 1999 set out the requirement for employees to manage health and safety effectively including a risk assessment (HSE 2000).

A Fleet Driver Register was also introduced (in 2002), designed to allow the Driving Standards Agency to monitor the fleet driver training sector – and standards - more closely. Training is almost exclusively on-road. All trainers must be in possession of a (pre-licence) driving instructor qualification (ADI). In addition, future trainers will have to be specially trained by accredited training organisations in order to be included on the new fleet driver register. Course providers often offer full risk management services, based on a company audit and a tailored course to meet company needs.

In the UK the Institute of Car Fleet Management which was established in 1992 and aims to develop the capability and enhance the standing of fleet professionals. It provides a structured education and training syllabus and methodology designed to meet the needs of newly appointed as well as established vehicle fleet managers, administrators and fleet industry specialists leading to vocational qualifications. It also supports research and best practice which it communicates to members and stakeholders.

In the UK the Department for Transport has established an outreach programme to raise awareness of the importance of work related road safety in the business community and public sector. It uses advocates drawn

from these communities to promote the business benefits of managing it effectively. Business champions, some of whom are featured in our PRAISE project, constitute the central element of the Driving for Better Business campaign. They are those firms that are prepared to step forward to champion good practice in work related road safety by taking a business message to business. Each Champion makes public a case study to demonstrate how driving on business is managed. The studies always centre on the business case and include the following elements on driver safety:

1. Provide a driver's handbook that includes road safety guidance and sets out individual driver responsibilities, in support of the company's policies and procedures, e.g. what to do in the event of an incident.
2. Ensure that all employees driving on behalf of the company are initially vetted, inducted and regularly assessed, to establish that they are properly licenced, competent, suitably trained and medically fit to do so.

The UK's Health and Safety Executive has also been involved in a pilot project whereby certain Metropolitan Police officers have been given powers under the Health and Safety at Work Act, to supplement their powers under Road Traffic Law. These powers allow trained officers to follow up possible inadequacies in the management of risks by employers to those who drive at work. Feedback to date has been positive with early data suggesting that there is room for improvement, in many cases, and a belief that this can best be addressed by increasing awareness of employers' responsibilities under health and safety law and by advising them of suitable action.

In 2003, the UK Department for Transport and Health and Safety Executive issued a guidance document on 'Driving at work: Managing work-related road safety'. It clarified that the vehicle is classed as part of the workplace under health and safety regulations, and that organisations need to have risk assessments in place for their drivers, vehicles and the journeys they undertake. The document, can be found online (<http://www.hse.gov.uk/pubns/indg382.pdf>).

Research was also prepared and piloted for the UK's DfT on Company Incident Vehicle Reporting and Recording in 2002<sup>12</sup>. The aim of this project was to

help companies and organisations which use vehicles ranging from motorbikes to lorries to work out how many accidents their vehicles are involved in, and why this is so. Information about the extent and causes of their accidents can help companies make informed decisions about the most effective measures to implement to reduce their accident rates. Such measures could be applied to organisational systems, people (including driver training), the working environment and the vehicles. The project provides a range of excellent tools for organisations to report, record and learn from their collisions, and use the information to guide the development of their driver risk assessment, monitoring and improvement initiatives.

## Germany

The German sector differs considerably from other countries in that the German Road Safety Council (DVR) has developed a quality scheme of their own which was implemented in 2008 and is valid until 2011. The Quality Standard is called: Quality Certificate for recognised and controlled learning. One of the reasons for setting up the standard was to certify quality offers on the market and provide an incentive to training companies to meet certain criteria and standards. The aim of the standard is to offer clients seeking training an easily recognizable sign. This is to make clear that improving road safety is one of the key aims of the training offered. Quality certificates are given to those trainers who offer practical training seminars with driving on suitable practice areas and also on the road and in combination. Trainers must fulfill criteria which are evaluated qualitatively in the five areas of content, methodology, education and further education of the trainer, quality assurance as well as a further option on the place of training. The Quality Certificate is managed by the DVR project with input of a special working group on content and quality assurance, independent experts and auditors who observe training on site. For more information about how the Certificate works and for a full list of the criteria that the trainers are evaluated on look at: [http://www.DVR.de/download/qualitaetssiegel\\_broschuere\\_05\\_08.pdf](http://www.DVR.de/download/qualitaetssiegel_broschuere_05_08.pdf). The DVR has also developed a manual on delivering driver and rider training [http://www.DVR.de/download/QM\\_H\\_SHP\\_SHT\\_2009\\_03\\_10.pdf](http://www.DVR.de/download/QM_H_SHP_SHT_2009_03_10.pdf). Experts from DVR member organisations, aided by technical committees, develop DVR safety programmes for target groups including

12 <http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme5/companyvehicleincidentreport4781>

professional drivers tailored to different vehicle types:  
[http://www.DVR.de/download/safety\\_quality\\_cost\\_2007.pdf](http://www.DVR.de/download/safety_quality_cost_2007.pdf).

## Sweden

The Swedish Work Environment Authority has provided a brochure<sup>13</sup> for employers on occupational road safety including relevance of the Directive 89/391 on Health and Safety. It also includes advice on how to develop a road safety policy covering risk assessment.

Sweden is the home of the famous Vision Zero approach. Early in 2010 a new Vision Zero Academy under the Vision Zero Initiative will be launched. The role of the Academy is to generate knowledge based policy advice on innovation and implementation of traffic safety management systems, services and technologies. This aims to create a new centre that will inform stakeholders about the most effective and science based innovations and how they can be implemented to eradicate serious health losses due to road traffic crashes. The Vision Zero Academy will be set up by the Swedish Road Administration and will focus on professional training, research and development adapted to specific target audiences. Legislation for employers, such as Occupational Health and Safety regulations or licences to operate, play a major role in safety. Investigating how this legislation works so far is important and should be a main theme for the Academy. The Academy could also study the implementation and the effects of the introduction of the Traffic Safety Management System, ISO 39001. This will play a major role in shaping future road safety policy and is likely to be crucial for the understanding of market growth for traffic safety.

## Poland

The Polish Road Safety Partnership, an NGO, runs a Fleet Safety Programme launched in 2006. The fleet safety initiative focuses on gaining commitment from senior management in companies operating vehicle fleets to implement programmes to improve the road safety performance of their drivers and vehicle fleets. As part of this programme it published "Fleet Safety Guidelines" in September 2007. The

2007 edition consists of two safe fleet handbooks, one targeting management and the second aimed at drivers.<sup>14</sup> The handbooks were developed by partners using international good practice models and examples. The handbooks are supported by awareness raising and training seminars run regularly in fleet safety are offered by the Partnership.

## Member State Recommendations

- Member State governments should encourage initiatives which build capacity to ensure that driver training is tailor made to suit particular driver/trainer's needs.
- At the national level, including 'purpose of journey' in the reporting and recording systems of road traffic collisions would allow a fuller understanding of the 'work driving' problem and better targeting of both road and health and safety resources including driver training.
- Governments should ensure that riders receive appropriate training when they start to use a motorcycle (or re-start after a period of not motorcycling) and that they receive further training as they progress from smaller to larger motorcycles. Motorcyclists should be made aware of the difficulties other road users have in detecting them and evaluating their speed.
- Develop a common, practical accident data management framework to assist employers in managing the risks for 'at work' drivers and needs including driver training.
- Include training on fitting Child Safety Restraints to vehicles, how to use a fire extinguisher, and how to respond to an emergency with children during the transport (for bus and truck drivers as included in the Directive 2003/59).

## Part 4. Employer Level Initiatives

The fourth and final section looks at employer level initiatives to train drivers with some examples of best practice. It also includes some advice to employers such as a checklist for employers to select trainers. Although employers are only legally obliged to train drivers of certain vehicles under EU law as presented above they must also comply with its Health and Safety Directive. Moreover the private sector is keen to show how it is

13 [http://www.av.se/dokument/inenglish/broschures/adi\\_578eng.pdf](http://www.av.se/dokument/inenglish/broschures/adi_578eng.pdf)

14 Fleet Safety Handbook for Management, [http://www.pbd.org.pl/fileadmin/Dokumenty/przewodnik\\_bezpieczna\\_flota.pdf](http://www.pbd.org.pl/fileadmin/Dokumenty/przewodnik_bezpieczna_flota.pdf)  
 Fleet Safety Handbook for Drivers, [http://www.pbd.org.pl/fileadmin/Dokumenty/Przewodnik\\_kierowcy.pdf](http://www.pbd.org.pl/fileadmin/Dokumenty/Przewodnik_kierowcy.pdf)

acting in a socially responsible manner, which in the field of fleet management very often means going beyond legal requirements. Also all non-private customers, such as governmental bodies, local authorities and companies can play an important role by setting examples for others. This means that both private and public employers should consider driver training as part of an integrated approach to improving road safety. If selected and run properly then driver training can be part of a strategy taken by an employer to reduce work related road risk. As stated earlier, the crucial starting point for employers is a risk assessment which includes the drivers. Part of this should also be to ask drivers themselves what they need; a self assessment. This can be undertaken in house or by an external organisation.

Employers should look at which different courses exist but also look at what needs they will address and link these as closely to what their employees need. They should try and select courses which address each of the four levels of the GDE Matrix which form driver behaviour: basic vehicle control, mastery of traffic situations, trip related considerations, personal characteristics. A good course would also include the fifth level, the organisational setting within which the driving takes place. Courses that place the participant at the centre should also be prioritised. The practical experience should build up risk awareness of the driver. The classroom sessions should include ample time for discussion and feedback particularly at the very end of the course. In fact, interaction and interactive and reflective training methods are the optimal ones.

### Johnson and Johnson

Johnson and Johnson is one of the multinational companies working in Europe which has one of the world's most proactive organisations with regards to occupational road safety<sup>15</sup>. In the Europe, Middle East and Africa (EMEA) region alone the company operates over 13,500 field sales, service and management vehicles. Its SAFE Fleet programme has been in place for ten years and provides a standard framework that its subsidiary companies work to six key objectives. This includes that senior management support safe driving as part of the work culture through leadership, monitoring improvement, training and ongoing engagement. Local Safe Fleet teams are responsible for implementing measures such as training new drivers, reducing cases

of high-risk driving and hiring field safety coordinators. Driver development including orientation, home study and behind the wheel training is one of these objectives as is meeting health and safety objectives. These efforts have translated into real success. SAFE Fleet has reduced injuries, accidents per million miles (APMM) and percentage of vehicles involved in incidents. Part of this success has also been due to a high-risk driver early detection system to identify drivers with the potential to drive unsafely. The company uses innovative tools and technologies, including Virtual Risk Manager<sup>16</sup>, to identify risks in a proactive way and contribute to further decreases in collisions. J&J are also involved in the leadership of a pan-European fleet safety benchmark initiative and involvement in [www.fleetsafetybenchmarking.net](http://www.fleetsafetybenchmarking.net) to exchange cross-company best practices and experiences. Finally their fleet safety does not end when engaging drivers to take the road safety message home to their families and friends.

### Heracles General Cement Co.

Heracles General Cement Co. in Greece, a member of Lafarge group, has implemented a wide scale road safety programme including driver training. The success of the driver training component of the programme lies in its coordination within a wider road safety programme and policy developments, the continuous nature of the training, the collaboration with contractors and a marked accent on defensive Driving training. The company achieved the target of 0 road deaths.

In 2007, training in defensive driving of subcontractor drivers and Head Quarters personnel was implemented, as well as training of new employees through trips with instructors. A series of regular road transport safety meetings with all the company's drivers (more than 600 in total) was launched in 2008, providing an opportunity for discussion and collaboration on safety issues.

Finally, GPS was installed in 2009 in almost 90% of the fleet, providing information for assessing drivers' performance and their profile. As a result speed limit violations were reduced from a number of 14,000 on 1.2million km in January 2009 to 20 violations on 2.2 million km in December 2009.

<sup>15</sup> Case Study Summary adapted from <http://www.fleetsafetybenchmarking.net/main/repeat/sidemenu/casestudies.php>

<sup>16</sup> <http://www.virtualriskmanager.net/main/>

In addition to all the above, road safety is enhanced in terms of technical equipment, by the new “safe pass” of each vehicle, which certifies that the vehicle has passed specific technical inspections in certified workshops ensuring its regular monitoring<sup>17</sup>.

### Wolseley UK

Wolseley UK is part of Wolseley PLC, one of the world’s largest building and plumbing suppliers to both trade and private customers. Wolseley UK operates a fleet of around 3,000 commercial vehicles throughout the UK. Wolseley UK established the Fleet Safety Steering Group, aimed at reducing the number of collisions experienced each year. A number of different initiatives are being introduced at present including some related to driver risk assessment and training. Online driver risk assessment is run based on a scheme of the Risk Foundation and using the Safe Driving Pledge program. Plans are now in discussion for a UK roll-out to 4,500 drivers and a pan-European program for 8,000+ people, followed by a global roll-out to all of the current 74,000 employees who drive as part of their work. One important element of Wolseley’s driver training approach is the online driving assessment programme, which has been developed in conjunction with their insurer Zurich, designed to enable the identification of potentially ‘at risk’ drivers, so that preventive measures can be taken prior to any such incidents occurring. The Risk Foundation section of the online driver risk assessment has taken 15 sections of the Wolseley UK fleet safety policies at random, and tests an employees’ understanding of the procedures. An employee cannot complete the assessment or move onto the next section until all the questions are answered correctly and hence the policies both read and understood. Many organisations have road safety policies but few make their interaction with their employees so live<sup>18</sup>.

### Checklist for Employers to select trainers (adapted from Advanced 2002 and Virtual Murray et al 2009a)

If employers are in a country where a validated accreditation system exists, this should be their first port of call when selecting a training course. We propose that employers refer to this checklist when choosing

which training for their employees. For organisations considering the implementation of BTW (behind the wheel) training, the following good practice questions to ask the training supplier have been useful in many previous cases:

- a. Can you undertake a full fleet audit to ensure compliance legal requirements on work-related road safety?
- b. Can you carry out risk management analysis on costs, causes and collision numbers?
- c. Can you provide validated risk assessment, monitoring and evaluation tools?
- d. What research and experience is the programme based on?
- e. What type of training are you offering (ranging from basic skills, through defensive driving to attitude/management culture based programmes)?
- f. Can you administer the programme?
- g. Can you train managers, supervisors and in-house trainers if necessary?
- h. Will the recommendations/interventions/training be based on a detailed needs analysis or an off the shelf package?
- i. Who are your other clients (successes and failures)?
- j. Do you have long term performance evaluation data?
- k. Will you run an initial small scale pilot programme?
- l. What are your pricing mechanisms and are there any hidden ‘back end’ costs?
- m. Will the training require ‘work time’ or can it take place ‘on the job’?
- n. What ‘shift patterns’ do you work to? Is it available 24/7/365?
- o. Are you registered, qualified in OHS and risk management and what quality badges do you have?
- p. Is driver training actually what we really need, or should we be focussing on wider management culture or mobility management programme?
- q. Can the solution offered cope with our volumes of drivers and data?
- r. What Management Information, data warehousing and integration with our other systems is provided and how secure will our data be?
- s. What long term supplier support is available?
- t. How is the driver feedback and feedback to line managers managed?
- u. How will the service support our Corporate Social

17 EU-OSHA (in print) Case Studies Report Study of Protection of Road Haulage Workers, Bilbao.

18 Source for Case Study <http://www.drivingforbetterbusiness.com/casestudies/wolseley.aspx>

- Responsibility (CSR) and brand enhancement needs?
- v. How will you support our union and change management initiatives?
- w. Can the program be implemented beyond the UK, or for international visitors to the UK, and in what languages is it available?
- x. How are privacy issues managed, particularly around very sensitive data such as collisions and licence violations?

## Training for Grey Fleet Drivers?

Some employees drive their own vehicles for work, the so-called 'grey fleet'. A gap analysis risk assessment should be undertaken to ensure that if drivers use their own vehicles on work business they are also included in the employers' work related road safety policy. Employers need to specify minimum standards of vehicle safety features, maximum age, etc if they are being driven for work purposes. Managing the grey fleet should respect the same requirements as other company cars. Training, following a driver risk assessment, should therefore be offered to all who need to drive for work, regardless of if they are using their own cars or vehicles of the company. Also, any incident involving a vehicle being driven on company business must be reported and investigated for risk management purposes.

## Training of other employees?

As well as the training of drivers, employers should also look to integrate road safety requirements into other aspects of their business. This includes training fleet managers themselves but also vehicle purchasers to integrate safe vehicle into their purchasing policies (PRAISE Thematic Report 1). In the transport sector, training should also include those responsible for setting up scheduling to take fatigue into account. Finally, training should also include educating the leadership and management of an employer to raise the understanding of integrating road safety into their management practices.

## Recommendations

Employers should:

- Recognise and apply the business case to implementing risk assessment and training.
- As a minimum comply with aforementioned Directives.

- At the interview stage explore past accident or prosecution history and attitudes towards road safety.
- Undertake driver/rider assessment on recruitment. This should also include checking documentation, licences, driver training records and fitness to drive records and assess driving competence and attitudes.
- In case of Powered Two Wheelers also ensure for appropriate training including provision and proper use of protective equipment and clothing and check that this is being implemented by the riders (Directive 1989/391 EEC Article 13.2b).
- Integrate training needs and assessment in an ongoing system of driver monitoring.
- In case of a collision or driving incident (even when driving own vehicle for work purposes), undertake an in depth driver assessment.
- Fully train drivers in all relevant aspects of their jobs. Refresher training to ensure that drivers will maintain a high level of performance over a prolonged period of time should be performed.
- Provide adequate training if the driver is required to drive a new or different type of vehicle or with in-vehicle safety technology.
- Choose accredited trainers, if this system exists, use a checklist to choose their training provider and ensure that the training delivered is tailored to the needs of the driver.
- Ensure that training sessions include reference to specific company policy on driving for work.
- Subject drivers using their own vehicles to the same recruitment, induction, assessment and training procedures as company-car drivers.
- Integrate road safety relevant themes into the professional development of other staff such as schedulers, vehicle purchasers and of course management and leadership.

## Conclusion

Applying risk assessment and appropriate driver and rider training is a key part in improving road safety whilst driving for work. Examples of what can be done also illustrate the benefits of this approach. This Thematic Report has presented the main ingredients for employers to put into practice and take note of when setting up the system for driver risk assessment and training. It has also presented room for further action on the European and Member State level for improving existing legislation and initiatives. A PRAISE Fact Sheet Case Study focussing on Driver Assessment and Training featuring the Suckling Transport



Company is published together with this Thematic Report.

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# "PRAISE": Preventing Road Accidents and Injuries for the Safety of Employees

February  
**10**  
Fact Sheet  
**2**

## ETSC interview with Suckling Transport



ETSC's PRAISE project, "Preventing Road Accidents and Injuries for the Safety of Employees" aims at mobilising knowledge needed to create work-related road safety leadership. The project will advance the awareness of the need for work-related road safety management and provide the know-how to employers who have to take on that challenge. It also aims to present the work-related road safety standards of road safety champions, by presenting employers' success stories, notably through the PRAISE Fact Sheets. This Fact Sheet complements the PRAISE Report "Fit for Road Safety: From Risk Assessment to Training" published in February 2010.

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## Suckling Transport Introduction

Suckling Transport has specialised in the transport of fuel by road since 1987 and delivers nearly two billion litres of inflammable liquid per year. It operates 65 articulated road tanker vehicles and employs 200 people in the UK. Normally vehicles operate in the livery of the customer concerned (e.g. Shell and Jet) or TankShare, which is a brand name used by Suckling Transport. The Company competes in a market sector dominated by large, multi-national companies such as DHL and Wincanton. To compete successfully, it must differentiate itself and road safety seems to be the perfect way to do this. Suckling Transport has therefore launched the Zero Incident Project (ZIP) in 2008.

Below is a photo of Peter Lerner, Managing Director of Suckling Transport, presenting a cheque to Employee team captain Gordon Johnstone after the Scottish team reached one million kilometres without having an accident of any kind. The 1mKm Challenge has been an important part of the ZIP project and it allows employees to adopt a Charity

to whom Suckling Transport makes a donation whenever a team meets the 1mKm Challenge.

Interview with Peter Lerner, Managing Director, Suckling Transport

## Road Safety management at Suckling Transport

### 1. What triggered your decision to take measures to improve road safety?

As the Managing Director I need to identify any serious risk to the future of the business. An issue such as cash flow, for example, is easily recognisable as a threat (but, fortunately, not for Suckling Transport). It occurred to me that, in a diminishing insurance market, the inability to obtain motor insurance cover would certainly pose such a threat. So a good safety record became a pre-requisite of our long-term business plan.

Through its project style of management, Suckling



Transport has received recognition for environmental best practice and for innovation. So launching the Zero Incident Project (ZIP) in 2008 seemed natural. This safety initiative began with a project team considering how the company might eliminate accidents, or crashes, completely. The three main areas examined by the project were technological developments, driver training and procedures.

All received wisdom militates against the concept of zero accidents. The British Standards Institute once said of me that I “enjoy going against the grain by turning people’s pre-conceptions on their head”. Achieving zero crashes is a pre-conception I cannot resist.

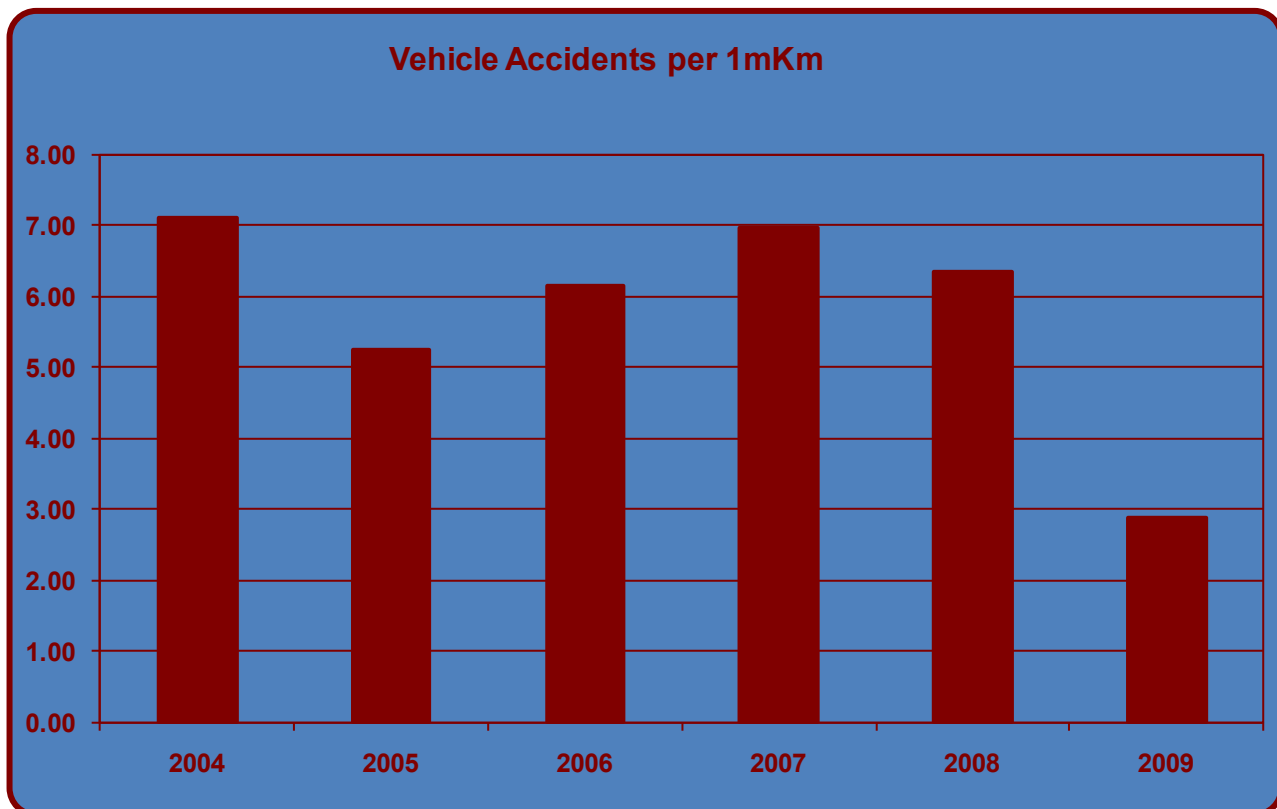
**2. In brief can you summarise your company’s road safety strategy?**

Suckling Transport places safety above everything else. We demonstrate this commitment and communicate it to the workforce in practical terms, by not compromising safety in any way. My role, as Managing Director, is to create a robust safety culture that is understood, and contributed to, by the workforce. It is important to recognise that it can only become a generative culture

if it is subscribed to by the workforce, rather than imposed on that workforce.

In practice, this involves minimising our employees’ exposure to risk through assessments, including full site and route risk assessments for every address we deliver to. The company supports this through a management regime that ensures compliance with regard to drivers’ hours regulations, speeding, use of mobile telephones and other issues that affect safety. It provides incentives to drivers to improve safety, holds driver toolbox talks and its managers conduct behavioural safety observations of drivers at work. We have effective methods for communicating safety to the workforce through our quarterly News Bulletin, the monthly Safety in Numbers newsletter and, more formally, through Health Safety and Environment committees, handbooks, policies and procedures. And, finally, we provide training to ensure our employees have the skills they need to perform their duties safely.

**3. Can you provide any figures tracking the improvements in your safety performance over the years?**



Graph 1: Vehicle Accidents per Million Kilometers

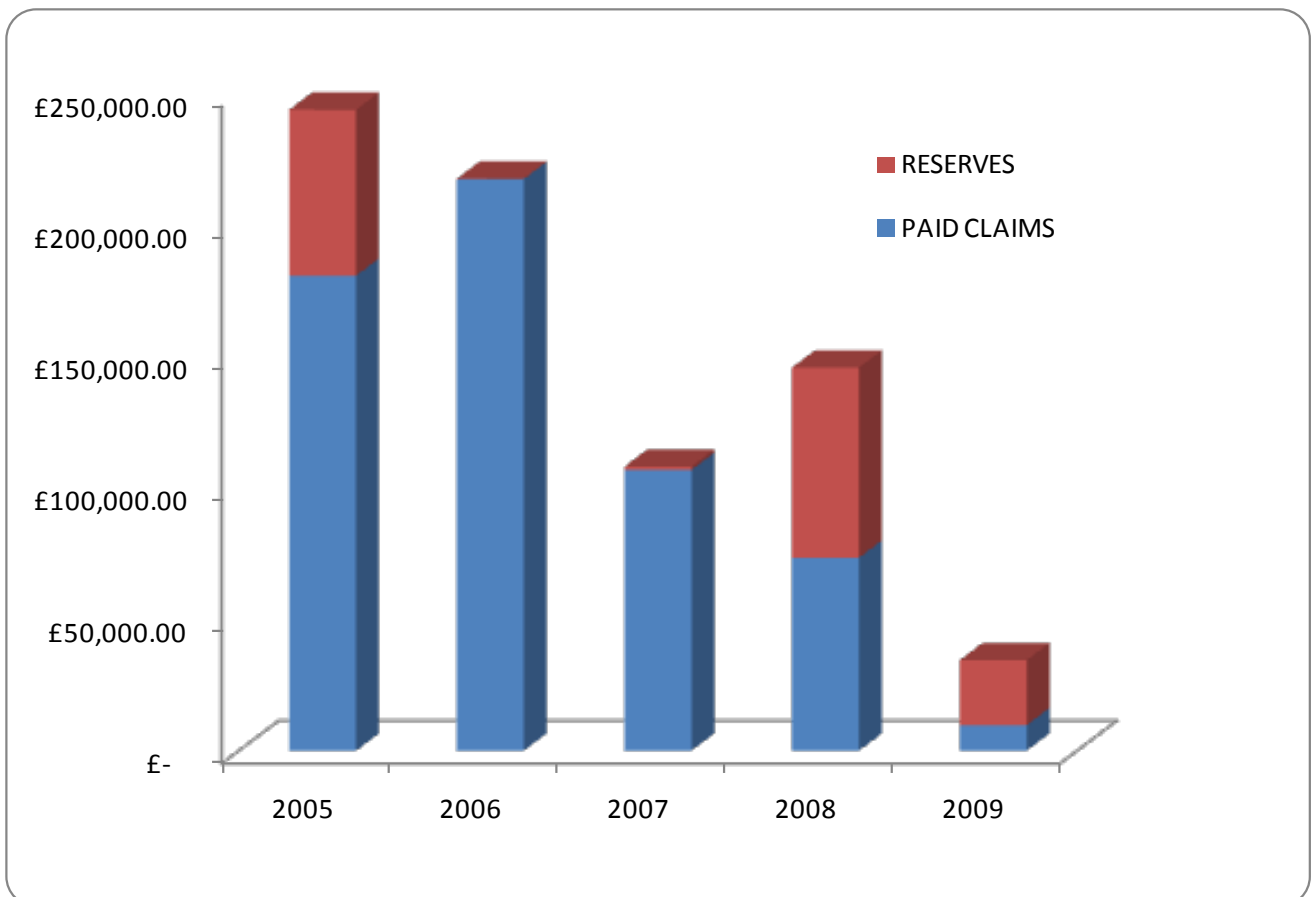
Graph 1 demonstrates the significant improvement in accident frequency in 2009. Between 2004 and 2008, the Company recorded between 5.2 and 7.1 accidents per 1 million kilometres. This average of 6.3 fell by over 50% in 2009 to below 2.9 accidents per 1 million kilometres.

Graph 2 shows an 80% improvement in the severity of accidents. The average cost of motor vehicle insurance claims amounted to £180,850 per annum in the 4 years prior to 2009. Claims fell to just £34,437 in 2009.

4. Did you establish contacts with any road safety organisation or hired consultants to develop your road safety policies?

We have received very good advice over the years from our customers – Shell, ConocoPhillips, and other major oil companies. We have never enlisted the help of consultants but the safety organisation Brake has been extremely helpful, particular one of its advisers, Dr Will Murray. On-line guidance from organisations like RoadSafe is also useful and we are signatories to the EU Road Safety Charter.

5. How is your road safety management organised (for example is there one person



Graph 2: cost of motor vehicle insurance claims

dedicated entirely to road safety, or is this part of some executive's list of duties?)

We have a Safety Manager and assistant, but safety needs to be led by the Managing Director, in order that its status is understood by all employees. It is important that I share the safety duties of our management team, by giving safety talks and communicating effectively with the drivers.

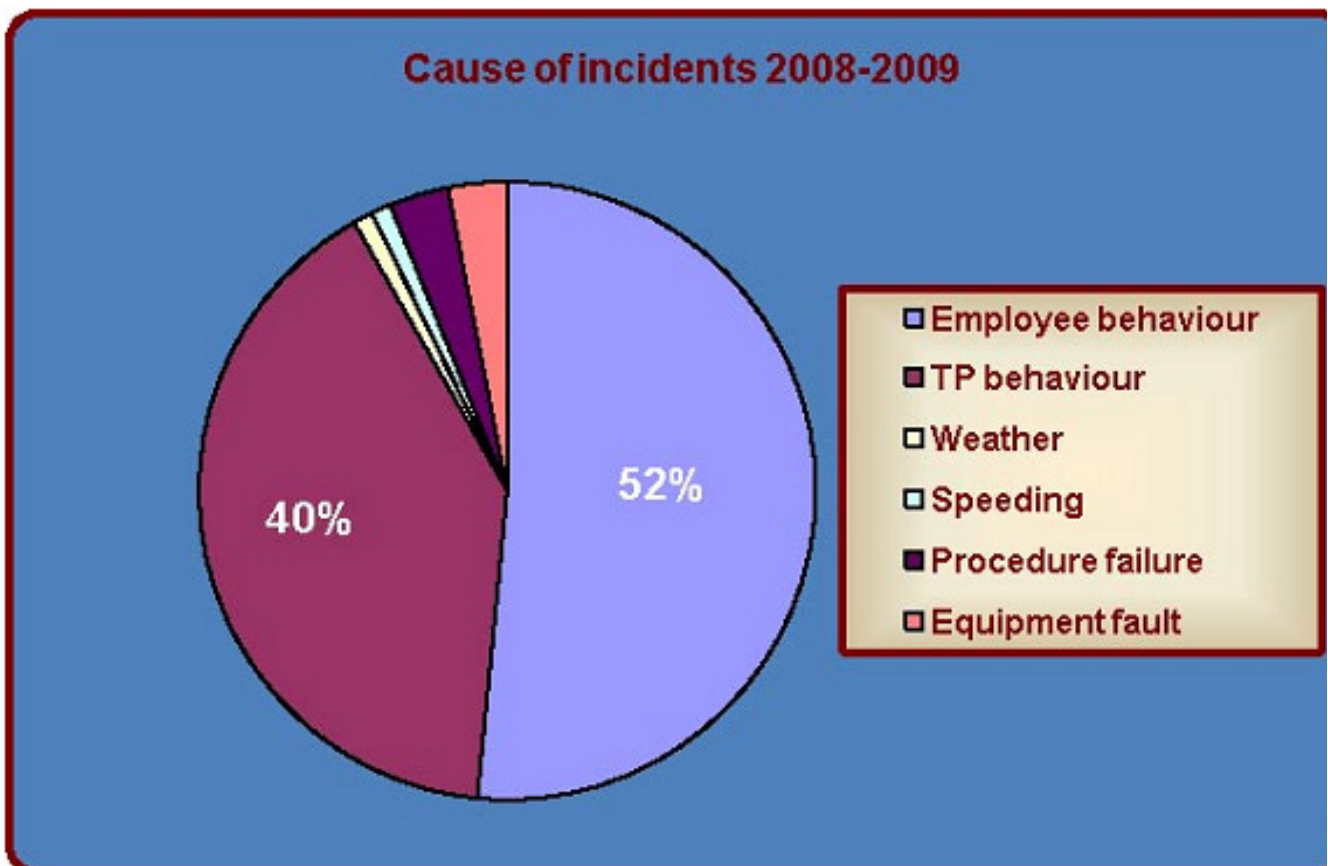
6. What is the leading cause of collisions in your operations?

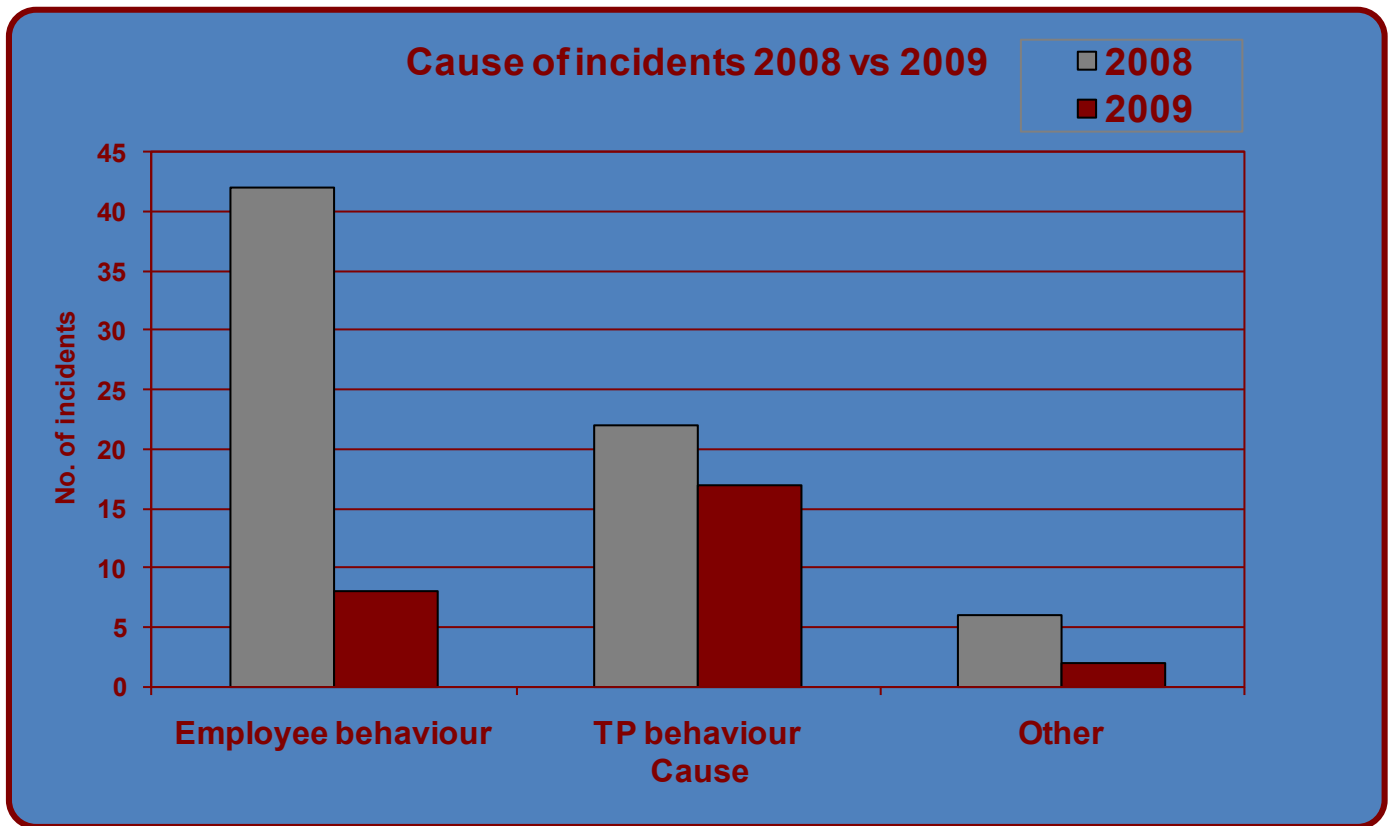
Accident investigations are a source of information that leads to corrective action which, in turn, reduces accident frequency. It is important, therefore, that we record all incidents, including zero cost incidents.

The leading causes of collisions are our own driver behaviour and that of the third party. Speeding is a rare occurrence in our company and, as such, where it contributes to an accident we record it separately from driver behaviour. It is considered a wilful act rather than, say, a misjudgement on the part of our driver. We have done a considerable amount of work in recent years to reduce the impact of speeding and fatigue, and we have significantly reduced the need for reversing manoeuvres on sites, so these now represent a small proportion of causal factors.

Graph 3 shows the proportion of incidents by cause. The number of incidents in each cause fell in 2009, as demonstrated in Graph 4, with the most significant fall in accidents resulting from our own drivers' behaviour. This was the result of the changes made to our training methods.

Graph 3: cause of incidents 2008-2009





Graph 4: cause of incidents 2008 vs 2009

7. How did you come to that conclusion (how do you collect the data)?

Every incident is investigated to establish the root cause. Methods of establishing root cause have improved in the last year too. Stopping at driver behaviour or third party behaviour has been replaced by a search for the cause behind that conclusion. It will be interesting to see how our view of causes changes as our skill in detecting root causes improves. The information we record is reconciled with a monthly claims history sent to us by our insurers.

8. Do you think that transport companies have a duty to go even further than the legislation framework regarding traffic safety of the country in which they operate?  
Yes, I do; without doubt. Legislation provides the

minimum standard required. If Suckling Transport is to differentiate itself from its competitors then it must go beyond that minimum standard. A safety culture based on the minimum standard lacks ambition and sends completely the wrong message to the workforce.

9. What do you think should be the starting point of a company that wishes to do that?

We need to analyse risks and seek out ways of eliminating those risks, as we did with our Zero Incident Project. Raising standards, such as increasing the frequency of driver medicals to improve fitness to drive procedures, can result in increased costs. For a company of our size these are decisions we need to take. Even if Suckling Transport was the cheapest option, potential customers would not believe it. DHL or Wincanton would always be perceived as the lower cost option. So we can never compete on



price. We can only compete on service and safety levels and, to do that, we must aspire to be the best. Raising the bar at frequent intervals is part of that process.

## The Business Case

1. Have you calculated the financial benefits resulting from your investments in road safety in terms of the avoidance of collisions and casualties? Maybe in terms of fuel saved / vehicle maintenance or repair costs saved / fewer insurance claims or lower premiums?

It is essential to demonstrate the cost v benefit case to shareholders. The cost of accidents should reflect both the actual cost and the possible cost had the full potential of some incidents been realised. Failing to address the rising cost of insurance claims could result in a company becoming uninsurable and drive it into liquidation.

The cost of safety related items is often quite small. The on-board computers and other equipment fitted to our trucks improve safety but also improve fuel consumption. Only a few items, such as reversing aids, refer solely to safety.

The best way of demonstrating the financial benefits of the ZIP initiative, which included our new approach to driver training, is through data on the cost of accident claims provided by our Insurers. This is shown in the graph above (graph 2) and reveals a substantial reduction in claim costs in 2009. Last year motor insurance premiums amounted to £237,000. We expect to see a reduction in those costs this year.

2. Do you feel that your customers are reassured by knowing that you have strong safety standards? And how do you

communicate that to your customers?

Most certainly. Major oil companies expect the highest level of safety from their contractors. Our customers conduct regular, and intensive, safety audits to ensure we perform at the highest level.

3. How do you feel that your safety policies fit in with your other concerns (environment / quality assurance / company turnover)?

It is a misconception that companies need to 'trade off' other concerns against safety. Those responsible for delivering a quality service in our organisation must do that whilst fully complying with our safety policy and procedures. There is a temptation for individuals to place expediency over safety; to defer a safety inspection on equipment in order to meet a delivery. It is essential that everyone in our organisation understands that any such action will be punished, rather than rewarded. The 'profit' achieved through a service success can never compensate for a 'loss' incurred through a safety incident. This needs to be at the core of the company's safety culture.

4. Will you consider adopting the upcoming ISO 39001 certificate on road safety management? This standard should be published by ISO in 2011 and will be of relevance for any company involved in road transport and wishing to receive an international certification for good road safety standards.

Yes, we certainly will be talking to Worldwide Quality Assurance about ISO39001. We are registered to ISO9001:2008 and to BS EN 12798, which provides a safety standard specifically for transport companies carrying dangerous goods. We intend to examine the benefits of supplementing or replacing BS EN 12798 with ISO39001.

## Driver Training

### 1. What are the main elements of your company's driver training activities?

Apart from specific training such as manual handling or the legislative requirements for the training of LGV drivers (CPC) and, in particular, drivers of dangerous goods vehicles (ADR), the Company's training provision was historically based on a periodic driving assessment every two years. Drivers were subjected to an in-cab assessment by a colleague, who had been externally trained by the Freight Transport Association. Corrective training was then provided.

In 2009 Suckling Transport fitted on-board computers that could provide information on the skills of the driver, both in terms of safety and fuel efficiency. This made 'intervention' training, rather than periodic training, possible. We then selected six drivers to become our team of Driver Instructors. They attended a one-week course which was provided by Smiths Systems, a US organisation that specialises in this field. The Instructors were then equipped with mobile telephones and laptop computers so that they could receive reports from the on-board computers and communicate with other members of the team about correcting any skill deficiencies they found. The on-board computers are also used to identify corrective actions from post-incident investigations.

### 2. What motivated you to start?

The new technology identified in the ZIP initiative convinced us that 'intervention' training should replace the 'periodic' training methods of the past. This enables us to target training more effectively.

### 3. Did you involve your employees/drivers in taking the decision to invest into driver

training? If yes, how?

Senior shop stewards and driver HSE representatives were consulted throughout the process. Once the Driver Instructor team was formed, further consultation took place with them. Demonstrations were also provided to the new Instructor team by Driver Trainers from the manufacturers of the trucks we used – MAN and DAF - and the makers of the on-board computers RTL, to ensure that our new Instructors had an in-depth knowledge of the trucks and the equipment on board.

### 4. What has been the opinion of the drivers? Are they supportive?

The drivers have been very supportive of the changes. We had always provided quarterly toolbox talks at each operating centre and attendance had been good. However, after consulting with the workforce, it was decided that the content of these talks should be changed from the more philosophical discussions that had taken place about road safety in general, to more practical discussions, where we discussed actual accidents and near misses. Our new training plans stemmed from these discussions.

Early in the ZIP initiative, we identified that the main reason why our accident frequency levels had not improved for several years was that we were, in reality, victims of our own success. The fewer accidents we had, the fewer opportunities we had to take corrective action. Paradoxically, the reason we had seen such good improvement up until 2005 was because we had experienced so many accidents and had a constant source of active and latent causes that enabled us to take corrective action.

In order to ensure this source of information continued, we incentivised drivers to submit near miss and potential incident reports. Before doing this, I consulted with individual drivers to try to establish why they were reluctant to submit such reports. The answer was simple: it involved them

in extra duties, they saw little tangible benefit from the process and feedback had been poor when they did submit such reports.

We therefore simplified the PIR (potential incident report) card and improved the feedback to the drivers. More importantly, I asked the drivers to imagine a world where they would be driving along and an audible message would be given in the cab of the vehicle to alert the driver that he, or she, was approaching an accident black spot, or some other hazard. This would be possible, I explained, because we had the technology but, more importantly, because a colleague of theirs would have submitted details of the hazard on a potential incident report. This demonstration of the benefits of risk identification and communication was a catalyst to securing the co-operation we needed. In 2009 we received over 300 near miss and potential incident reports from drivers and we can now start turning them into static or dynamic data for the new audible warning system for drivers.

## 5. How did you choose which type of training was best suited to your needs?

Our General Manager and Safety Manager looked at a number of defensive driver training systems. We had previously used the Freight Transport Association (FTA) and still use this organisation for other services. However, we decided to implement the Smiths System, which involved an instructor in the system travelling to our head office from the United States to spend one week with our Instructor team. Apart from the training itself, the week that the Instructors spent together at a hotel near head office was a great team-building experience too.

## 6. Have you been able to measure the improvement resulting from such activities?



The Smiths System Training Team

The Zero Incident Project was largely driven by a failure to improve our accident frequency record since 2004. We saw a significant improvement in both frequency and severity following ZIP (See Graph 1 and 2). Many of the elements of ZIP were rolled out progressively, so we are continuing to see an improvement.

### 7. What have been the lessons learnt and what would you advise to other companies considering going forward with this sort of practices?

None of the practical aspects of ZIP, or the change in the provision of driver training, would have been successful without the foundation of a strong safety culture. You would not build a house, without first building the foundations.

When Suckling Transport was awarded contracts with Shell and ConocoPhillips, 100 and 40 drivers transferred respectively, under TUPE (Transfer of Undertakings Protection of Employment regulations), with the contracts. It was several years before the workforce believed that we genuinely placed safety above service. Drivers are naturally anxious to keep the end customer satisfied, by completing the delivery in spite of obstacles and adversity. They link service with the retention of the business and with job security. Only by demonstrating, in practical terms, that it must always be safe to do so, can our safety culture prevail. So be patient, build a platform; a good idea, on its own, is not enough.

### Other Matters

#### 1. Are there any problems that persist despite the measures that you have taken? If yes how do you plan to tackle them?

Accidents result from a combination of latent and active causes. Active causes are frequently the result of behavioural failings on the part of the driver. It is important to understand the role of training in this process.

When a new driver joins the Company, he or she is in a state of unconscious incompetence (they do not know that they are in need of training). Once training begins, they become consciously incompetent (by recognising that they require training). After training has been provided they move to a state of conscious competence and, hopefully, through refresher training, remain in that state throughout their employment.

Unfortunately, through an attitude promoted by complacency an individual can regress. As an example, a driver conducting his, or her, daily vehicle check finds no defects over a sustained period. Eventually, the individual mistakenly concludes that such checks are unnecessary because the risk level is low, and so they either cease the practice, or become less diligent until an accident occurs.

Addressing this problem is the key to achieving our aim of zero incidents because, only through pro-active measures, will we eliminate accidents completely. On-the-job behavioural safety observations by managers is just one of the processes we are introducing to achieve this aim.

#### 2. Do you foresee actions to tackle risk factors that are more difficult to detect, (for example regarding driver's fitness to drive: fatigue/ drugs/ health problems...)?

Suckling Transport has introduced both random and 'with cause' drugs and alcohol testing and we randomly check 10% of the workforce each year. We subject our drivers to a medical every 2.5 years and annually for those aged over sixty.

We have Occupational Health Advisers and a regime of checking fitness to drive (a) on recruitment, (b) every 2.5 years (c) post-incident, (d) after 3 absences in any rolling year and (e) after any prolonged absence.

If fitness to drive is found to be a contributing factor in the future we would increase the parameters used in this process - for example: by changing (d) to 2 absences.

3. Are there any particular in-vehicle safety equipment that you have fitted your vehicles with or wish to fit them with? If yes why, and how do you / will you monitor the use of such equipment?

Our Zero Incident Project included trials of 14 items of safety equipment. Some of these referred to tank and hose fittings, but many were generic items used on the tractor unit. These included: Object sensor on cab, reversing aid on trailer, lane departure warning system and vehicle stability control. These were monitored as part of the project and drivers and customers were consulted on their suitability. Those adopted were either fitted retrospectively or specified on any future trucks. Those rejected were simply recorded as such in the project control document.

4. Does your route planning take road safety into consideration? For example how do you ensure that delivery schedules do not pressure drivers to speed / do you consider what is the safest /shortest route (maybe through satellite navigation ) etc.?

A site and route risk assessment document is created for each delivery point. These are kept on a database at head office and a file containing the documents is kept at each operating centre.

At present, speed compliance is manually checked by managers as part of our Journey Management procedures. These include (a) random checks of tachograph speeds against local speed limits, (b) checks that rest breaks are not being taken whilst deliveries are made and (c) safe havens are used where a break is necessary. We are currently working with the suppliers of our on-board computers to introduce a number of changes. The first will create automatic checks for speed compliance by the system. I understand that this can be done every two minutes. The second will involve the geo-fencing of accident black spots, and other hazards, to provide an

audible warning to drivers.

ETSC would like to thank Peter Larner, Managing Director of Suckling Transport, for his precious contribution.

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# “PRAISE”: Preventing Road Accidents and Injuries for the Safety of Employees

May  
**2010**  
Report  
**3**

## Fitness to drive

### ETSC PRAISE Project

PRAISE is a project co-funded by the European Commission and implemented by ETSC on Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE). The project aims to advance work-related Road Safety Management and provide the know-how to employers who have to take on that challenge. It also aims to present the work-related road safety standards of EU Member States and carry out advocacy work at the EU level: work-related road safety is an area of road safety policy that clearly needs renewed political commitment.

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## Introduction

Driving is a demanding task and the risk of crash is high when individuals are not physically or mentally fit to drive. This is especially true when looking at work related driving, since conditions such as work related stress or sleepiness resulting from driving long hours come to play a role. This report looks into Fitness to Drive in the work-related context. The first part looks at Workplace Health Promotion (WHP). Improving the health and well-being of employees is of paramount importance for employers and can play a significant role in reducing road risks. It is thanks to general well being and healthy lifestyles that significant threats to safety risks such as sleepiness, addictions to alcohol or illegal drugs or medicines and stress can be avoided. The report then zooms into three specific areas that pose specific challenges: sleepiness, alcohol, and illegal drugs and medicines. This report covers existing legislation, examples of initiatives and case studies, and recommendations to the EU, to EU Member States, and to employers.

## Part 1: Workplace Health Promotion

Workplace health promotion (WHP) is of paramount importance, but it is also a real challenge for employers. Indeed workplace health promotion taps into matters such as lifestyle, work/life balance, and general wellbeing. The challenge therefore stems from the fact that lifestyle is a private issue, and employees can therefore only be encouraged to change certain behaviours, but can never be forced to do so (EU OSHA, 2010). The starting point for employers to address road risk of their employees is always to conduct a risk assessment in order to identify and list the factors that can lead to collisions and understand their magnitude (this is also a legal requirement following the European Directive 89/391 ).

Employers are very likely to find that a large number of driver related risk factors are related to health: stress, sleepiness, distraction, ageing staff, unhealthy diet, consumption of alcohol illegal drugs or prescription medicine, pre-existing diseases, smoking, lack of exercise, etc. When it comes to professional drivers, a

number of sector-related health conditions are also frequent: lower back pain, overweight, cardiovascular and respiratory disease, and work-related stress (EU OSHA, 2009). This is also amplified by the fact that the population of professional drivers is an ageing group. Drivers have to work under time pressure in a highly competitive environment providing a broad spread of tasks required by clients (EuroFound, 2004). Alarming for example is a European survey on stress indicating that the steepest growth in the number of employees under acute work-related stress between 1995 and 2000 was recorded in the transport and communication sector: from 27.2% to 36.9% (Eurofound, 1997, 2001). Such conditions are of course undesirable in themselves, but can also lead to collisions resulting in material damage or casualties.

Specifically, truck driving is a stressful job. This is due to the long and irregular working hours, pressure to deliver on time as well as the physical demands of driving and managing the traffic related context. Such pressures can have short, middle and long term implications for the physical and psychological impact on behaviour. A new project in Germany surveyed over 500 HGV drivers on the influence of work stress and individual management of stress . Results showed that the driver works on average more than 63.2 hours a week, of which 46.6 are purely for driving. More than a third of drivers (36%) have problems respecting the driving and rest times set by legislation. According to the survey the main cause of stress is the driving environment, followed by a lack of parking and resting areas, risky and aggressive behaviour of other drivers, bad roads, traffic density and traffic jams. With the increasing working hours, the driver is away from home for longer hours and expected to fulfil other non driving tasks which build up the levels of stress. Recommendations of the BAST Study, such as respecting EU legislation on driving times, are supported in this ETSC report.

WHP encompasses everything done by employers, their employees, and society to improve the health and well-being of people at work. Here are examples of a few WHP measures that employers can implement: enabling flexible working times; offering teleworking

1 For more information see PRAISE Thematic report 2 on Risk Assessment and Driver Training: <http://www.etsc.eu/documents/PRAISE%20Report%202.pdf>

2 Implications of the Stresses and Strains on Traffic Behaviour of HGV Drivers (BAST) 2010.



when appropriate; offering healthy canteen food; offering sport / relaxation classes; offering courses on social competence like dealing with stress. WHP requires commitment from both sides, employers and employees (EU OSHA, 2010), and as with every safety endeavour WHP works best when it is part of a safety culture endorsed at all levels of an organisation, starting with senior management.

Drivers should be aware that it is their responsibility to refrain from driving if they recognise that they are impaired. Employees should also be expected to inform their employer if they are under medication that could temporarily impair their driving. This information should be transferred by the medical doctors. This must at the same time respect doctor-patient confidentiality and privacy protection. If the medical condition requiring the need to take medicine persists then work should be adapted to take different ability, including possibly refraining from driving into account. There is considerable variation in response among individuals to many classes of medication. The user has the major role in self-monitoring. A higher level of precautions is required for drivers of large vehicles, in the emergency services and for some workplace drivers. Employers, such as bus and truck companies, police and fire services, may place additional obligations on drivers to report medication use to the organisation's occupational health adviser or to their supervisor before commencing duty (Tim Carter 2006).

### Absence of illness does not mean fitness

Significant health conditions that impair the driving task can prevent a driver from obtaining or renewing a driving licence. Yet the absence of illness does not necessarily mean matching all the conditions required for fulfilling those to be fit to drive. Medical checks performed when obtaining a driving licence or offered by the employer can help in detecting specific medical conditions or illnesses. Fitness or well being are conditions that need to be promoted through WHP measures and checked with appropriate means and measures.

### Business case

Beyond duty of care and legal obligations, a successful organisation will benefit in a number of ways from

WHP, and it therefore makes sound business sense to ensure that employees are fit to drive. This can be illustrated by: reduced absenteeism; fewer collisions resulting in material damage or even casualties; enhanced motivation; improved productivity; easier recruitment; increased turnover; a positive and caring image. Research shows investment in WHP yields a return on investment of one to 2.5 – 4.8 in reduced absenteeism costs (Bödeker and Kreis, 2004).

### Existing EU legislation with relevance for drivers' health

Two EU Directives have important implications also for work related driving and drivers' health. A new EU Driving Licence Directive was adopted in 2006 (2006/126/EC). This legislation plays a role in influencing road safety at work in two ways: by setting questions related to fitness to drive during theory tests to obtain a licence; and by harmonising medical checks and minimum standards of physical and mental fitness needed to obtain and renew licences. Questions on the following subject must be included in theory tests (Annex II of the Directive):

- Point "2.1.2." of the Directive (to obtain all licences):
- Importance of alertness and of attitude to other road users;
- Perception, judgment and decision-taking, especially reaction time, as well as changes in driving behaviour due to the influence of alcohol, drugs and medicinal products, state of mind and fatigue.
- Point "4.1.1." of the Directive (only to obtain licences in categories C, CE, C1, C1E, D, DE, D1, D1E: Group 2 drivers): Rules on driving hours and rest periods as defined by Council Regulation (EEC) No 3820/85 of 20 December 1985 on the harmonisation of certain social legislation relating to road transport; use of the recording equipment as defined by Council Regulation (EEC) No 3821/85 of 20 December 1985 on recording equipment in road transport.

This legislation also notably harmonises the minimum frequency of medical examinations for the renewal of driving licences in categories C, CE, C1, C1E, D, DE, D1, D1E (Group 2 drivers). Indeed, as from 19 January 2013, licences issued by Member States for such categories shall have a maximum administrative

validity of 5 years (Members States can opt for less than 5 years if they wish so). Obtaining the licences and renewing these licences after this maximum 5 years administrative validity is subject to the continuing compliance with minimum standards of physical and mental fitness for driving set out in Annex III of the Directive (this includes indications regarding a range of abilities, health conditions, or health deterrents including: sight; hearing; locomotor disability; cardiovascular diseases; diabetes mellitus; neurological disorders; mental disorders; alcohol addiction; systematic use of drugs and medicine products; renal disorders; and other miscellaneous requirements).

A Directive on Driver Training of professional bus and truck drivers (2003/59/EC) also recently came into force. This aims to provide better training for professional drivers who must now pass an initial qualification and undergo hours of periodic training. An Annex to this directive includes a number of subjects that must be incorporated into the initial qualification and periodic training of drivers, including:

- Point "3.3" of the Annex 1 to the Directive, with the objective to prevent physical risks: ergonomic principles; movements and postures which pose a risk, physical fitness, handling exercises, personal protection.
- Point "3.4" of the Annex 1 to the Directive with the objective of raising awareness of the importance of physical and mental ability: principles of healthy, balanced eating, effects of alcohol, drug or any other substance likely to affect behavior, symptoms, causes, effects of fatigue and stress, fundamental role of the basic work/rest cycle.

The European Commission Road Safety Unit has set up working groups of experts meeting regularly to discuss on a number of topics relevant to "Fitness to Drive". One of those is the working group on alcohol, drugs, medicines and driving. The group will provide the Commission with science-

based recommendations for possible measures to be implemented in order to reduce drink/drug-driving, including the appropriate use of alcohol interlocks systems, rehabilitation schemes, and classification of medicines according their impact on driving capacities.

The Commission has a regulatory Committee dealing with Driving licence issues, in which all Member States participate. The Driving Licence Directive contains a special medical Annex (III) on minimum standards of physical and mental fitness. One of the tasks of the Committee is to regularly update this Annex according to technical and scientific developments, as it was the case with the driving licensing possible to patients affected by diabetes, epilepsy and eyesight problems. At present the Commission had asked for a similar revision concerning drivers affected by cardiovascular diseases.

## EU level Initiatives

The European Agency for Health and Safety at Work (EU OSHA) has included health and safety of transport workers as<sup>3</sup> a main element of its work programme for 2008-2010. The objectives are to support the exchange of good practice information in the sector and the sharing of experience by providing examples of preventing occupational risks in road transport and how to promote OSH good practice and raise awareness of OSH issues within the sector.

Activities include web feature and database of links to good practice; case studies on preventing occupational risks in road<sup>4</sup> haulage and bus driving; review (scoping exercise) of good practice information available for taxi drivers, motorbike and bicycle couriers; and a review of some specific accidents in the sector and lessons learnt from them.

This work includes a broad range of occupational risks to transport drivers, not just road safety issues and driving hazards, but also: loading, unloading vehicles; falls climbing in and out of cabs; rest and toilet facilities; vehicle design and maintenance; musculoskeletal and

3 <http://osha.europa.eu/en>  
[http://www.virtualriskmanager.net/main/aboutus/niosh/written-paper\\_eu-osha.pdf](http://www.virtualriskmanager.net/main/aboutus/niosh/written-paper_eu-osha.pdf)

4 EU OSHA has published a number of Case Study Reports (2008) on the Protection of Drivers from different sectors which are included in this report.

vibration related disorders; hot and cold cabs; stress; violence from members of the public.

The EU OSHA project also recognises that drivers are not a homogenous group and will consider older drivers, young drivers, women drivers.

### National level Initiatives

A lot can be done at the national level to encourage employers to undertake WHP. Governmental schemes, via financial incentives or simply via the provision of information and services, are vital to get employers on board, including small and medium size companies that might otherwise not be willing or even able to identify WHP as one of their concerns.

#### Finland: investigation of truck drivers' health

Despite the current requirement for medical examinations of professional drivers (Group 2) based on the EU Driving Licence Directive (above), the Finnish Institute for Occupational Health (FIOH) found that the physical condition of truck drivers is poorer than that of employees in most other occupations.

FIOH therefore ran a project<sup>5</sup> to find an optimal set of screening tests – either questionnaires or physical tests – that can be used to detect truck drivers' health problems. They examined the health status and well-being of 65 male long-distance truck drivers in a Finnish truck company in 2005-2006 and obtained the following results: 50% of the drivers complained of sleep deficit or other problems in alertness; 20% had a clinically significantly impaired lung function, which was related to tobacco smoking; 50% of the drivers were at increased risk of cardiovascular disease (2/3 had high blood pressure); and 40% of the drivers fulfilled the criteria for metabolic syndrome. These results led to the following recommendations:

- Attention should be paid to the very first, however slight, signs of risk factors of cardio vascular disease and alertness and sleep disorders, which demand early intervention.
- Improving the lifestyle of professional drivers

requires attention in areas such as exercise, smoking, healthy meals and snacks, alcohol use, and sleep deficit. Standardised and tailor-made questionnaires and physical examinations and laboratory tests are needed to assess the individual health risk of drivers.



Pic 1: Transport Enterpriser Pentti Koskinen<sup>6</sup>

These findings lead to the conclusion that the EU Driving Licence Directive medical requirement should be interpreted as an absolute minimum requirement. The drivers need knowledge about the physical effects of inactivity and long working hours on their health and their alertness and work performance. Health condition or risks should be detected early, the reasons of risks should be examined, and interventions should be directed to the reasons of risk to support work capacity.

#### Germany: DocStop

The medical support for drivers of heavy goods is a problem. Heavy goods vehicle drivers are often on the road for a long time and have limited possibilities to consult a doctor, which can lead to the driver driving with health impairments or taking medicine which is not specially prescribed.

The aim of DocStop is to improve medical care of

5 EU OSHA Programmes, Initiatives and Opportunities to reach drivers and SMEs in the Transport Sector (2008).

6 Photographer Olli Blomberg The picture is not related to the research described above

haulage drivers in transit on European transportation routes by building up a medical information and supply network for drivers. Drivers who need medical attendance should have the possibility to consult a doctor while being on the road. DocStop was established as a pilot project in 2007, based on a survey carried out in Germany in which suggestions to improve the situation were made. A network of contact points at truck stops has been established. These are located within 4 kilometres of medical facilities. Good support for the project has enabled the provision of a medical care system for haulage drivers throughout Germany. Information and communication methods to promote the project such as TV, radio, flyers, trade organisations and personal dialogue with drivers are used. The project was initially run in Germany and is offering information for transit HGV drivers on the availability and location of physicians in several languages. The project was initially run in Germany and is now being implemented at the European level.

DocStop is supported by many organisations and enterprises in Germany and Switzerland e.g. Germany's Statutory Accident Insurance for the vehicle operating trade, BGF, BGL, ADAC, MAN, Mercedes Benz, Swissdrivers etc. About 200 contact points have already been created, situated at rest areas along the highways. Docstop appears to be well accepted by drivers and has support from the sector (EU OSHA 2008).<sup>7</sup>

### 'Get the Risk Out' Campaign, Germany

Also in Germany a new campaign called 'Get the Risk Out' ("Risiko raus!") to reduce the collision risk whilst driving and transporting goods has been launched in January 2010 by the German Social Accident Insurance, and will be run in co-operation with the German Federal States and the German Road Safety Council (DVR), and will run for two years. The central theme of the campaign is for drivers to focus on the driving task. Many of the causes of the accidents relate to carelessness and overestimation of one's own abilities. The campaign aims to stress

the need to improve working conditions so that time pressure and stress don't come into play in the first place and generally to increase risk awareness and more thoughtful working. It targets employees, trainees, school pupils, as well as employers, leaders of companies and those responsible in business for health and safety and teaching at school and at vocational training colleges.

Furthermore, the German Road Safety Council has developed a chapter of a website for young drivers entitled "Move on"<sup>8</sup> in the context of its work-related road safety activities. It aims to inform young drivers on issues relating to fitness to drive and to work including drugs and alcohol and sleepiness. A recent article includes for example precautions to take if driving when diagnosed with diabetes.<sup>9</sup>

### United Kingdom: Department for Transport's cycling to work scheme

The advantages of more walking and cycling for public health and environment (reduced mortality and healthy lifestyles through regular exercise) outweigh their disadvantages (the risk of death or injury).<sup>10</sup> In the UK to promote healthier journeys to work and to reduce environmental pollution, the 1999 Finance Act introduced an annual tax exemption, which allows employers to loan cycles and cyclists' safety equipment to employees as a tax-free benefit. The exemption was one of a series of measures introduced under the Government's Green Transport Plan. Guidelines<sup>11</sup> clarified how organisations can take advantage of the exemption to implement a Cycle to Work scheme that encourages employees to cycle to work and allows employers to reap the benefits of a healthier workforce. This means that an employee can purchase a bike and associated safety equipment (helmets, high visibility clothing, lights etc.), from their gross income, payable as instalments over a 12 month period.

7 For more information: <http://www.docstoponline.eu>

8 [http://schueler.nextline.de/webcom/show\\_softlink.php/\\_c-18/\\_cmt-23cc0473613e5fa21e1f9f22a66c3101/i.html](http://schueler.nextline.de/webcom/show_softlink.php/_c-18/_cmt-23cc0473613e5fa21e1f9f22a66c3101/i.html)

9 [http://schueler.nextline.de/webcom/show\\_article.php/\\_c-5/\\_nr-274/i.html](http://schueler.nextline.de/webcom/show_article.php/_c-5/_nr-274/i.html)

10 Sælensminde, K., 2004. Cost-benefit analyses of walking or cycling track networks taking into account insecurity, health effects and external costs of motorized traffic. Transportation Research Part A 38, 593–606.

11 <http://www.dft.gov.uk/pgr/sustainable/cycling/cycletoworkguidance/>

## Recommendations to EU/Member States

- Remind employers that employees' ill-health should be considered as part of their risk assessment under Directive 89/391, and promote WHP as the most efficient tool to combat ill-health.
- Promote the Business Case for WHP to employers.
- National Health and Safety strategies should include measures to combat the health risks associated with road transport, for professionals in the road transport sector in particular.

## Employer Level

Employers have an important role to play in promoting health in the workplace. Clearly this can be boosted with the understanding of the business case for health promotion. Ill-health invariably means reduced productivity and increased absenteeism, and should therefore be a core concern for employers. Healthy lifestyles can be promoted in a number of ways, but it is important not to invade employees' private life and consult them when taking decisions and offering new services. It is important for employers to understand that complying with health and safety regulations are only minimum requirements, and is not necessarily enough to reap the benefits of having a healthy workforce.

## Good practice

### "Rahtarit ry" in Finland

Rahtarit ry, the Finnish organisation of truck drivers, which is a member of the international organization, UICR (Union Internationale des Chauffeurs Routiers) together with the Finnish Health Association and the Dairy Nutrition Council in Finland ran a campaign entitled: "A Healthy Driver Can Cope"<sup>12</sup>. The goal of this campaign has been to promote the health and well being of employees in the transport sector. Two different approaches were used, one aimed at drivers and the other aimed at service providers. There is coherence between the health of the drivers and traffic accidents and so the objects of attention were healthy nutrition, physical education, and other

topics including also the moderate use of alcohol. Parts of the campaign included informing drivers via the membership magazine of the Truck Driver organisation. Also over 500 truck points/resting places all around Finland participated in the project by providing healthy meal alternatives for truck drivers and by distributing health-education materials. Multiple fit-to-drive events were organised in the truck points/resting places and in connection with various trade fairs all around Finland. These events comprised measuring the public's cholesterol, blood pressure, and carbon monoxide, as well as personal health education. Part of the projects have been incorporated in to the everyday practice of many truck points/resting places. This project also serves as an excellent example of how collaboration between different organisations in health promotion can benefit truck drivers. The long-term impact is difficult to measure, because of the general raising of health awareness.

### Bertschi AG, Germany

A chemical transport company Bertschi AG<sup>13</sup>, has a strategy to reduce the number of road traffic accidents and workplace accidents involving heavy goods drivers. They set a 50% reduction target to be reached in 5 years, as well as to ensure a high effectiveness of the system with constantly checking the observance of safety rules. Regular individual training sessions are held. During these training sessions drivers are made aware of a number of policies Bertschi AG have developed to improve safety. Alongside a policy of no phone calls during driving, constant use of seat belts, a zero alcohol principle is included. The training is followed up as the driver has to pass an individual check at regular intervals - either on the road or at the loading or unloading places. The respective head of department follows the heavy goods vehicle with his own car and observes the mode of driving and loading/unloading of the driver in question. In line with the practical side of checking the driving, drivers are tested for alcohol at regular intervals.

<sup>12</sup> EU OSHA Protection of Passenger Road Transport Drivers (2008).

<sup>13</sup> EU OSHA Protection of Road Haulage Drivers (2008).

## Recommendations to Employers

- Offer/require medical examinations when employing new staff, and periodical examinations for existing staff. Regarding commercial drivers of group 2 vehicles, the respect of the medical requirements of the Driving Licence Directive should be interpreted as a strict minimum and not necessarily a definite indicator of fitness to drive.
- Implement WHP measures in the workplace which may include: enabling flexible working times; offering teleworking when appropriate; offering healthy canteen food; offering sport / relaxation classes; offering courses on social competence like dealing with stress / training on proper sitting position when driving.
- As a minimum provide information to employees about the occupational health risks associated with their job and preventative measures.

## Part 2: Sleepiness

### Scope of the problem

The human body's natural sleep wake cycle means that most people feel sleepy twice a day (at night and in the afternoon), drivers are therefore more likely to fall asleep when operating vehicles at that time (TIRF, 2009). Crashes caused by tired drivers are most likely to occur on long journeys on monotonous roads, between 2am and 6am, between 2pm and 4pm, especially after eating or drinking even one alcoholic drink (ROSPA, 2009). A small part of the general population (3-5%) also has to cope with obstructive sleep apnoea, a sleeping disorder which contributes to above average day-to-day sleepiness<sup>14</sup>. However, in Finland results from a survey involving 1097 heavy vehicle drivers indicated that one fifth of drivers suffered from sleep apnoea (Partinen et al., 2005). Sleepiness manifests itself in slower reaction time, diminished steering performance, lesser ability to keep distance to the car in front, and increased tendency to mentally withdraw from the driving task. The withdrawal of attention and cognitive processing capacity from the driving task is not a conscious, well-planned decision, but a semi-autonomic mental process of which drivers may be

only dimly aware. The causes of sleepiness are sleep loss, time awake, circadian phase, and time on task, and not sleeping enough. Sleepiness can also be linked to alcohol, stress, obesity, medicines, and sleep apnoea as mentioned above. It has also been observed that problems of sleepiness are greater among young drivers.

While it is difficult to detect sleepiness and therefore estimate the number of accidents caused by it, sleepiness is an important contributory factor in a large proportion of road crashes (range 10-20%). Sleepiness is associated with increased risk. A person who drives after being awake for 17 hours has a risk of crashing equivalent to being at the 0.5 g/l blood alcohol level (i.e. twice the normal risk)<sup>15</sup>. The increased risk often results from a combination of biological, lifestyle, and work-related factors. In Great Britain research shows that up to 20% of accidents on monotonous roads, such as motorways, are fatigue related (ROSPA, Fatigue Facts). In the United States it is believed that up to 20% of serious crashes may be due to fatigued or drowsy driving (Horne & Reyner, 1996; Horne, 2000).

Importantly, drivers do not seem to be using the best options to reduce sleepiness. For example, a public opinion survey in Canada concluded that drivers rely upon: opening windows/turning on the air conditioning (43.7%), talking to passengers (34.2%), stopping to eat/exercise without sleeping (31%), and changing radio station or CD (30.4%) (TIRF, 2009). Employers need to deter their employees driving for work from relying on such techniques. The only viable solution is to adopt a proper sleep pattern and, when experiencing sleepiness to stop and have a nap. This should be embedded within an employer's Driving at Work Policy, with clear limits of both time and distance and an encouragement to use hotels or alternative transport.

### Sleepiness in the professional transport sector

A major risk factor affecting driving for work is

14 [http://ec.europa.eu/transport/road\\_safety/specialist/knowledge/fatigue/index.htm](http://ec.europa.eu/transport/road_safety/specialist/knowledge/fatigue/index.htm)

15 [http://ec.europa.eu/transport/road\\_safety/specialist/knowledge/fatigue/index.htm](http://ec.europa.eu/transport/road_safety/specialist/knowledge/fatigue/index.htm)

sleepiness. Working in this sector is not characterised by the typical “9 to 5” working hours. Research shows that driver sleepiness is a significant factor in approximately 20% of commercial road transport crashes. Surveys show that over 50% of long haul drivers have fallen asleep at the wheel. Increased crash risk occurs at night (peak levels at night can be 10 times daytime levels), the longer the working day and with irregular hours. Those sleepiness factors that have been shown to influence road safety need to be better controlled in regulation policy and risk management. The most important factor that will ensure safety is to effectively implement and enforce regulation (ETSC, 2001).

There are several scientific studies reporting the negative health effects of non-standard working hours and possible psychosocial problems, both short-term effects and long-term associated health effects. Night work also has an impact on traffic accidents: if an accident occurs at night, the risk for a serious accident is much higher. According to the European Survey on Working Conditions (Eurofound, 2005), workers in the sector transport over land seem to work shifts more than the average European worker [about 26.8% of the transport workers reported they work shifts against 16.1% of the average working population.] They also seem to work more often on Saturdays and Sundays than workers of the average working population. They also work more often more than 10 hours a day than the average worker: 43.1% declared never working more than 10 hours a day (against 59.7% for the normal working population), 14% declared working more than 10 hours a day 11-20 times a month (against only 5.9%), and 6.8% more than 20 times a month (against 4.2%).

While working times have been discussed extensively for road transport, a lot still remains to be done regarding the other transport subsectors, and public transport. While there is specific European Legislation in place for professional drivers of heavy goods vehicles, groups including self-employed drivers, non vocational drivers who nevertheless work on the move (for example plumbers) and drivers of vans or company cars do not have to comply with this legislation. Such drivers are however often exposed to very long distances or long hours of driving and are therefore particularly at risk.

## Sleepiness and other vehicle drivers

Sleepiness is a major source of concern for the transport sector but it affects other driving groups too. Shift workers are a particular group that should not be overlooked. Accidents are particularly frequent on journeys home after night shifts (ROSPA, 2009). Shift workers work irregular hours and their sleep patterns are therefore disrupted, they also not always work same shifts which can be particularly confusing for their body clock. Night time workers are particularly prone to be tired on journeys home returning from work even if they sleep enough hours during the day. Employers of shift workers should therefore particularly be aware of the risks of sleepiness.

Many drivers who drive for work are not covered by regulations, such as driving hours (e.g. company car drivers or van drivers) but are nevertheless on the road for many hours. Vans for example are not regulated like heavy goods vehicles and this might be a drive that encourages transport companies to shift their loads to vans. Non-vocational drivers aren’t required to have vehicle equipped with tacographs either. However, through the deployment of telematic systems, it is possible to record and maintain a record of an individual’s driving hours. This can enable companies to adopt and enforce internal policies on working hours for all their drivers, irrespective of which type of vehicles they drive.

## European legislation and initiatives

The Working Time Directive (Directive 2002/15/EC) which applies to all mobile workers (excluding the self employed) performing road transport activities limits weekly working time to 48 hours, although weekly hours may increase exceptionally to a maximum of 60. The Directive also entails restrictions on night working and enforces rest breaks. The Driving Time and Rest Period Regulation (EC 561/2006) aims to introduce clearer and simpler rules about driving times, breaks and rest periods for professional drivers operating both in national and international transport. The basic principle is that by requiring a regular weekly rest period at least once per two consecutive weeks and a daily

rest period, social conditions for drivers and road safety should be improved.

Legislation covers recording equipment (tachographs) with Regulation EEC 3821/85 amended in 1998 to introduce digital tachographs. Directive 2006/22/EC identified minimum levels of enforcement required to secure compliance with the rules set out in the Driving Times and Rest Periods and the Tachograph Regulations. It provides common methods to undertake roadside checks and checks at the premises of undertakings as well as promoting cooperation between Member State authorities in charge of road transport enforcement. The European Traffic Police Network (TISPOL) for instance runs targeted campaigns throughout Europe to enforce traffic rules concerning trucks, including driver's hours & tachograph offences (for information about the 2008 'Operation Truck' campaign visit: <http://www.tispol.org/node/3602>).

EU legislation covering vehicle safety has also an impact on work related road safety as under the new Vehicle Safety Regulation 661/2009 trucks and other heavy vehicles must be fitted with Lane Departure Warning (LDW) Systems as of 2013. Lane Departure Warning devices can be effective in managing drivers experiencing sleepiness. Lane changing represents 4 to 10% of all crashes. Here too the emphasis is on heavy vehicles.

As part of the European ITS package, a Directive proposal includes developing specifications for ITS applications and services. Appropriate measures on secure parking places for trucks and commercial vehicles and on telematics-controlled parking and reservation systems is one of only four chosen priorities. Once in place this will better allow commercial drivers to plan their journeys and resting.

### National Level initiatives

A lot can be done at the national level, both in terms of targeting the professional transport sector but also the general population of drivers. Raising awareness about this matter is particularly important as most drivers are unaware of the risks associated with sleepiness. One further aspect of this problem is that

drivers do not feel they are infringing any traffic rule (as opposed to more conventional traffic offences like drink driving, speeding, or not wearing one's seat belt). Below are some examples of national initiatives.

### Italy

"Geososta" is a website created by the Fondazione ANIA (a road safety foundation created by insurance companies) that provides information regarding the location of rest areas and secure parking sites on the Italian road network. It is meant for professional drivers of heavy good vehicles but anyone can use this website. It also contains information about the parking capacity and facilities available on the sites to allow drivers to plan their journey. Digital maps containing the location of rest areas can be downloaded from this website onto GPS, and satellite pictures of the rest areas are also provided on the website (using "google earth") so one can see what the areas look like when you planning the trip ahead. Further, by registering on the site one is able to modify or add information regarding the amenities of the sites already visited. Geososta aims to provide information to drivers on where to rest, but also importantly on where they are likely to be safe and avoid theft while resting, as this is a recurrent source of concern among professional drivers in Italy as elsewhere. <http://sosta.smaniadisicurezza.it/>

### United Kingdom

In the United Kingdom driver sleepiness is estimated to account for around one fifth of accidents on major roads, and is responsible for around 300 deaths per year. The March 2008 THINK! Driver tiredness campaign was therefore launched as part of a wider Driving for Work campaign. Research has shown that people who drive for work behave in a risky way on the road, including driving while tired. The campaign has been developed with the work driver as a key target audience. Video clips, audio clips, posters and adverts, and publications about this campaign can be accessed online: <http://think.dft.gov.uk/think/mediacentre/237144/drivingforwork1>





Pic 2: Source [www.businessdriver.eu](http://www.businessdriver.eu)

### Germany: Austria, Spain and Poland Computer Based Training Programmes for Sleepiness

The EU co-funded project<sup>16</sup> ERIC has adapted a Computer Based Training Programme (CBT) on sleepiness and driving (and driver physics) for drivers in Austria, Spain and Poland. The programmes were already developed by the German Road Safety Council and were translated (including audible and written components), and adapted to the drivers and the different driving conditions in the other countries. They were then tested at several seminars involving different types of drivers in each partner country. The CBTs were further adapted based on the input during the pilots. The programme covers different aspects of sleepiness explaining for example the origins, how one can recognise sleepiness and what can be done to counter it including hints for everyday life. This is followed by a test. The project also assessed the availability of teaching and learning materials concerning sleepiness and the physics of driving and will publish a state of the art review. The final CBTs are being disseminated throughout the partner countries; a special effort is also being made to reach SMEs.

### Recommendations to the EU and the EU Member States

- Target professional drivers with measures to combat sleepiness. This can be achieved through information,

education and training about the dangers of driving when tired. Efforts should be made to target transport subgroups such as self-employed workers, drivers of vans and other non-heavy vehicles.

- Ensure there are consistent levels of enforcement of working time across the EU with penalties designed to strongly influence behaviour towards compliance.
- Promote Lane Departure Warning that can pick up sleepiness also to non-heavy vehicles (more details can be found under PRAISE Thematic Report 1 on in-vehicle safety technologies: <http://www.etsc.eu/documents/PRAISE%20Report%201.pdf>)
- Invest into research and development of technical devices to detect when drivers are feeling sleepy and provide warnings to them or even take control of the vehicle whilst restricting the levels of distraction that such devices could bring about.
- In the future, legislation concerning working and rest hours may be further improved and vehicles can be equipped with devices that detect sleepiness-related decrements in driver performance.
- Roads may be equipped with edgelines or centrelines that provide audio-tactile feedback when crossed over.
- To prevent head-on collisions the installation of median barriers on two-lane main roads with a speed limit of 80 km/h or higher should be considered.<sup>17</sup>
- Provide information regarding the location of rest areas and secure parking sites to allow transport workers to plan their journeys.

### Company level initiatives

Companies, especially transport companies, are encouraged to ensure that prevention measures are incorporated in their operations to combat driver sleepiness. This can be done in many ways such as applying strict internal policies (such as maximum driving hours or distances allowed while on duty), or providing informations to their employees/drivers about the risks associated with driving sleepiness and the ways to combat it.

16 Experiencing CBT Programmes in Road Safety in the European Community. <http://www.uv.es/proeric/index.wiki>

17. Lintu Reports 3/2006: [www.lintu.info](http://www.lintu.info)

## Tyvi Freight, Finland

An operations online management system has been developed and used by the Tyvi freight transport company for the management of regular working hours and working shifts along many other operations management applications. It is an intranet and internet-based system and enables to combine all information needed in the company in real time and therefore allow real-time management through bi-directional communication between the employer and the driver. Although the online system mainly helps Tyvi to improve its service to customers, it also enables improved drivers' working hours, and is thus a tool for enhancing workers' well being at work. In particular this allows the company to plan more "normal" working hours for drivers, i.e; shorter working days and more predictable, regular shifts. The system includes work and customer instructions, service instructions, laws and regulations concerning the transport business, and instructions for drivers on giving daily reports to the company (EU OSHA 2008).

## Swisscom Schweiz AG

Swisscom has launched a fatigue and distraction campaign in 2010 targeting all employees (4,000 fleet cars). It has adopted a Vision: 0 serious and fatal accidents. The goals are to improve road safety of employees; prevent damage to their image and operational disturbance and reduce vehicle damage. The measures adopted include disseminating information to all employees, sending a newsletter fleet car drivers, education and instruction of multipliers. This includes branch managers and safety agents. Exhibition with panels in buildings are also arranged as are quizzes and prizes, involving all employees and apprentices, some of whom attend the exhibition.

## United Kingdom

A major UK mobile telecommunications provider has a specific policy working around tired driving. Below is an extract from their current Driving at Work policy:

- Tiredness kills – Take breaks at least every 2 hours or 100 miles, get out of car and walk about for at least 10 minutes.
- When travelling on a long haul flight you should

not drive on arrival at your destination until you are absolutely sure that you are over "jet lag" or the general tiredness brought on by travel. It is recommended that you take a taxi or are met by a friend, colleague or family member.

- Driving excessive distances in one day (e.g. 3hr drive with 6-8 hours in the office then a further 3 hour drive), journeys of this type should be avoided; make an overnight stay to break the working day.

## Recommendations to Employers

(partly adapted from Will Murray, Interactive Driving Systems, Fleet Safety Gap Analysis; ROSPA Fatigue Facts; ROSPA 2002)

- Where long journeys cannot be undertaken without a significant risk of sleepiness, consideration should always be given to alternatives such as videoconferencing or alternative transport modes.
- Written guidelines on eliminating driver sleepiness are included in the health and safety management policy and driver handbook.
- Limits are to be set on acceptable driving durations and distances through consultation with employees.
- Drivers are made aware of the dangers of sleepiness and are advised on strategies to manage it. This should include line managers to ensure drivers are made aware of the need to get an adequate amount of good quality sleep before starting to drive, and asking drivers to take a 15 minute break every 2 hours (journeys should therefore be planned accordingly to allow for that). Employees should be reminded of the dangers of common practices such as 'moonlighting' (having a second job in the evenings), spending too long engaged in evening hobbies, etc. Most important, employers must stress that when feeling sleepy drivers must stop in a safe place as soon as practicable.
- The current shift patterns, journey planning, employment contracts and work schedules do not contribute to driver sleepiness and stress. As a minimum journey schedules, appointments and routes must enable drivers to stay within the Law.
- Employees should be asked to report to their managers when their sleep may be interrupted, for example by having to care for young children or sick or elderly relatives at home during the night, etc. They should be reassured that this will not lead to discrimination.

- Consideration should always be given to allow employees to ‘overnights’ away from home when on a work trip.
- Reactive monitoring: drivers should be encouraged and thanked for reporting instances when they felt tired at the wheel, and crashes while driving for work should be investigated to determine whether sleepiness may have been a contributory factor.
- Particular consideration should be given to night shift workers especially regarding journeys home after work, for example providing taxis home or sleeping facilities on site.
- Based on priorities identified in the risk assessment include in-vehicle technologies to combat sleepiness.

## Part 3: Alcohol and Work Related Road Safety

### Scope of the problem: drink driving

Driving whilst under the influence of alcohol contributes annually to around 10,000 deaths on EU roads. In the EU as a whole, at least 1% of journeys are associated with an illegal Blood Alcohol Content (BAC) (ESCAPE 2003, ETSC 2003). National data show that typically 15-25% of deaths are associated with alcohol impairment of an active accident participant. Even more dangerous, a combination of alcohol and drugs can represent an even more powerfully impairing combination further raising accident injury risk.

The business case for addressing alcohol impaired driving in the workplace is strong. The vast majority

of citizens with alcohol problems are employed full time. Employers can reap productivity gains and savings from a reduction in alcohol-related vehicle crashes<sup>18</sup>.

### Drivers of HGVs

In terms of demographic characteristics, a consistent picture of characteristics over-represented among drink-drivers emerges across a number of studies. These drivers are more often than average male, aged 18-24 years old, coming from a low socio-economic grouping, single or divorced, in a blue collar occupation, of low education and limited literacy and of low self-esteem (GRSP 2007, Bernhoft et al. 2008). But neither of these characteristics should be taken for granted. Given these characteristics of drink-drivers, it can be argued that drivers of commercial vehicles tend to have a profile corresponding to a typical drink-driver. Many of them are relatively young, male, single, or divorced, with a low self-esteem and coming from low socio-economic grouping. They drive as part of their professional job and risk much more than private car drivers if stopped while drink-driving. Apart from the immediate results of the crash they may also face a driving ban which could mean a loss of job if driving is especially the main part of their work.

As far as commercial drivers of HGVs are concerned, studies from different countries and road side surveys indicate that the prevalence of alcohol among this group of drivers is low and lower than among drivers of light vehicles.

Table 1. Prevalence of drink driving among HGV drivers according to TISPOL

Campaign	March 2008	October 2008	March 2009	October 2009
Truck drivers checked	115,364	157,961	183,024	169,839
Drivers with illegal BAC	510	615	282	329
% with illegal BAC	0.44%	0.39%	0.15%	0.19%

18 Network of Employers for Traffic Safety NETS <http://trafficsafety.org/>

Driving under the influence is thus less prevalent in commercial transport compared to individual transport. Yet, alcohol related road crashes in commercial transport result in more serious outcomes due to the vehicle crash incompatibility caused by increased size and mass of commercial vehicles. Besides, the number of people injured in such a crash may be high in case of vehicles operated by public transport companies. It can be concluded that it is of great interest to society and to individual companies to minimise the occurrence of alcohol-related crashes in commercial transport.

## EU Level Legislation – Initiatives and Guidance

On drink driving the EU published in 2001 a Recommendation on the maximum authorised level of alcohol in the blood of motor vehicle drivers. While the maximum authorised BAC level for passenger car drivers was set up as 0.5 g/l, the second reduced level of 0.2 g/l was recommended for drivers of heavy commercial vehicles (above 3.5 tons) and for novice drivers. However, Member States were left free to set their own levels and as a result, many Member States have not followed this recommendation (see Table 2). The Commission's EU Alcohol Strategy, led by DG SANCO, invites Member States to even consider a zero BAC limit for young and novice drivers and drivers of public transports and dangerous goods. Besides, the 2001 Drink Driving Recommendation and 2003 EC Recommendation on traffic law enforcement state that all of the Member States should adopt a system of random detection by analysing expelled air in order to dissuade drivers from drinking. Alcohol is also mentioned within the Directive 2003/59 on the initial and continuous training of commercial drivers transporting goods and passengers and the Driving Licence Directive as covered in Part 1 of this Report<sup>19</sup>.

Moreover, the Community Strategy for Health and Safety at work 2007-2012, developed by DG Employment, aims to achieve a reduction of occupational accidents and diseases in the EU. Health and safety strategies of EU Member States

developed within the scope of the EU Strategy should include information on drink-drive laws and penalties, effect of alcohol on driver ability, breath testing for employees who drive regularly.

Another tool included also in the ITS Action Plan that the EU should promote within the drink driving context are alcohol interlocks<sup>20</sup>. These are devices that require the driver to take a breath test before starting the car. Use of alcolocks in a work context might include the voluntary introduction either by public sector authorities or private commercial vehicle operators (Alcohol in Commercial Transport ETSC 2009).

## EU Level Recommendations

- Adopt a Directive for 0.2 BAC maximum limit for commercial and novice drivers.
- Launch an initiative for commercial transport companies to enhance safety of services by integrating prevention of drink driving as a competition factor into their business model.
- Gradually introduce alcolocks starting with target groups such as fleet drivers of, for example, dangerous goods.
- Integrate measures to address the impact of drink driving on work health and safety in the new Community Strategy for Health and Safety at Work 2013-2018.

## National Level – Good Practice examples of government initiatives

### Drink Driving Limit

Although all European countries have introduced a legal BAC limit only 15 have a limit of 0.2 or less for professional drivers and three of those only apply this lower limit to drivers of public transport. While in some countries (Czech Republic, Slovakia, Hungary and Romania), the limit was set at zero from the very beginning, in some others, notably Ireland, Malta and the UK the BAC limit is still 0.8 g/l.

<sup>19</sup> See also Thematic Report 2 on Risk Assessment to Training.

<sup>20</sup> For more info see our Thematic Report 1 on In-Vehicle Technologies and a section on Alcohol Interlocks.

Tab.3. Legal BAC limits for car and professional drivers in EU-27 countries and Switzerland by 1.1.2009 (source: DG MOVE)

Legal BAC limit (g/l)	Standard	Professional
Belgium	0.50	0.50
Bulgaria	0.50	0.50
Czech Republic	0.00	0.00
Denmark	0.50	0.50
Germany	0.50	0.00
Estonia	0.20	0.20
Greece	0.50	0.20
Spain	0.50	0.30
France	0.50	0.50 (0.20)
Ireland	0.80	0.80
Italy	0.50	0.50 (0.20)
Cyprus	0.50	0.50
Latvia	0.50	0.50
Lithuania	0.20	0.20
Luxembourg	0.50	0.20 (0.50)
Hungary	0.00	0.00
Malta	0.80	0.80
Netherlands	0.50	0.50
Austria	0.50	0.10
Poland	0.20	0.20
Portugal	0.50	0.50
Romania	0.00	0.00
Slovenia	0.20	0.00
Slovakia	0.00	0.00
Finland	0.50	0.50
Sweden	0.20	0.20
Switzerland	0.50	0.50
U n i t e d Kingdom	0.80	0.80

Note: Numbers in parentheses valid for public transport drivers.

The standard BAC for all motor vehicle drivers which should be adopted by all of the Member States is one not exceeding 0.5 g/l. At the moment most of the Member States have already adopted that BAC limit. In Ireland and UK, the limit is expected to be lowered soon.

### Enforcement and Follow Up

Drink-driving offences are in general punished very severely by courts of all Member States. The sanctions may involve temporary withdrawal of driving licences, conditional driving bans, obligations to participate in dedicated awareness raising programmes, and others. Commercial drivers are usually treated even more severely as professionals: they are expected to obey the law.

### Education and Campaigns

Research suggests that factors such as public education about BAC limits and the dangers of driving while impaired can play a key role in enhancing the effectiveness of legislation which targets drink-driving (Bartl et al. 2000). This would also impact professional drivers.

Driving schools play a primary role in providing necessary information on the risk of drink-driving, but the education activities do not stop here, as the driving licence is not a life-time permit to operate commercial vehicles. Two core education activities exist:

- Education programmes on alcohol in schools and in driver training (including for professional drivers)
- Programmes and initiatives run by employers and insurance companies.

### Preventative Policies in the Member States

#### Belgium

In Belgium all companies are obliged according to a new law to develop and integrate in their working place a preventative policy for drugs and alcohol.

## Ireland

Public authorities have a role to play when it comes to steering employers to provide adequate information and supporting material to employees. In Ireland, for example, two state agencies the Road Safety Authority supported by the Health & Safety Authority have cooperated together to inform employers of their responsibilities for driving for work and that specific information is provided on alcohol and drugs. The Road Safety Authority and the Health and Safety Authority hold joint seminars on a regional basis for employers which address road safety issues based on the driver, the vehicle and the journey. Both authorities have published a "Driving for Work" CD for employers which is available on their websites<sup>21</sup>. Both authorities held a Driving for Work conference in 2009 for employers on the theme of "Driving for Work".

## UK

The UK's 2007 annual drink drive campaign focussed on the risk of loss of licence, mobility and ultimately also possibly employment as a result of drink driving. The message of the campaign, which was run by the Government's THINK! campaign, was 'Don't let a drink-drive conviction come between you and Christmas'. The campaign was launched by a real life case of a 20 year old, Luke Noon, who lost his licence, job and girlfriend after his drink-drive conviction in 2006<sup>22</sup>.

## Germany

The local region of Guetersloh and the Accident Insurance Association of Westfalen-Lippe (GUVV) support a road safety action: „Young Driver"<sup>23</sup>. This community project is run together with the local Police and Traffic Watch Volunteers and aims to reduce collision risk of 18-24 year olds. The programme is run at vocational schools through the departments of Road Traffic together with the other partners through targeted practical driving exercises and discussions on the potential danger of road traffic. Included in the one day programme is a theoretical part led by a Police safety advisor and includes topics such as speed,

alcohol and drugs. The young drivers are also able to test within an alcohol driving simulator what it's like to drive with 1.0 BAC. A total of 2,600 young adults have participated in the project since 2005.

## Switzerland

An anti drink driving campaign was run in 2008 and 2009 by the Swiss Council for Accident Prevention. It was run together with the Police in Switzerland and Liechtenstein and enforcement was stepped up. More than 3000 safety delegates in companies were also involved in the implementation of the campaign. The aim was to reduce the number of alcohol related casualties increasing the subjective likelihood of controls due to increased police surveillance and intensified public relation campaigns. The second aspect was to improve risk awareness through education. The campaign targeted all drivers aged 18 to 44 years, especially men and new drivers. Road side posters were reinforced by also being displayed in the workplace. Cinema spots were shown and public events with alcohol simulators were organised. A new campaign is planned for 2010.

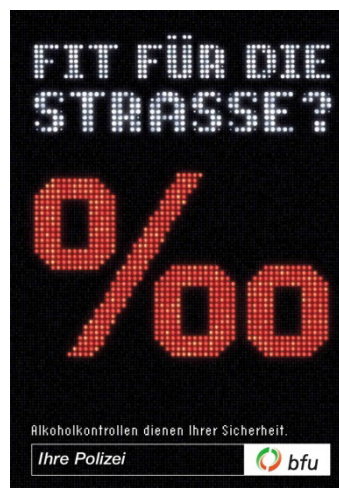


Figure 3. Poster asks: Fit for the Road?

## Recommendations to Member States

- Adopt a 0.2 BAC limit for commercial drivers.
- Increase enforcement of drink-driving and

21 <http://www.rsa.ie>, [www.hsa.ie](http://www.hsa.ie)

22 [http://www.dft.gov.uk/think\\_media/241033/241066/howmuchposter.pdf](http://www.dft.gov.uk/think_media/241033/241066/howmuchposter.pdf)

23 [http://www5.jungfahrer.de/040/sr\\_seiten/11217010000001784.php](http://www5.jungfahrer.de/040/sr_seiten/11217010000001784.php)

promote ‘targeted’ testing of those driving for work and systematically allow for a breath test in all police checks relating to driver behaviour and for all collisions dealt with by the Police.

- Run drink driving public campaigns linked to workplace health promotion (targeting also professional drivers) based on scientific research and linked to enforcement.

### Employer Level - Good Practice

Employers of commercial drivers have an important role to play in increasing the awareness of drivers about the risks of drink driving. Employers and fleet operators should be strongly encouraged to set up their own initiatives. This should form part of a holistic approach in setting up a road safety plan. One helpful set of guidance is set out in the ILO’s Code of Practice on Management of Alcohol and Drug-Related Issues in the Workplace.<sup>24</sup> This recommends that every employer should, in cooperation with employees and their representatives, develop in writing the enterprise’s policy on alcohol and drugs in the work place. In some countries, for example in Belgium, all companies are obliged by law to develop and integrate in their working place rules a preventative policy for drugs and alcohol<sup>25</sup>.

The elaboration of such a policy could follow a five step approach. Firstly, an inventory of issues related to alcohol (and drugs) should be listed including an anonymous survey for employees including questions such as where and when is alcohol consumed at work, what support would be necessary and what is expected to prevent alcohol at work. Secondly, a declaration of intent could be drawn up with different actors in the organisation to demonstrate the importance of the preventative policy. Thirdly, rules and procedures should be drawn up dealing with alcohol (and drugs). These written rules should clearly show what is permitted at work and explain procedures in case of breaking the rules and presenting solutions in case of problems. Fourthly, the organisation could offer information and training around the topic of alcohol (drugs) and health. Finally the policy should be evaluated and followed and adjusted according to suggestions and also experience. This policy should include specific measures on alcohol

which should be developed in discussion with the employees. The aim would be to spread a Zero tolerance approach to drinking in the workplace and whilst driving for work from the management level throughout the organisation. To implement, these employers may adopt a number of measures starting with education and information about the risks of drink driving to their own enforcement and follow up measures. Employers can also motivate drivers to comply with road traffic legislation by rewarding drivers respecting regulations and applying measures against those breaking the rules. The existence of safety culture and motivation programmes can also bring about a difference. Employers should also be committed to communicate to staff that crashes of commercial vehicles have additional negative side effects, the public image of a company involved in a serious crash can be damaged.

To increase the levels of deterrents employers could also run their own random alcohol tests. Another element is also to set up procedures. Alcolocks as part of an integrated alcohol policy can also form part of this solution. Alongside information about the risks, alcohol interlocks can also be a good preventative tool for deterring drink driving for drivers still affected by alcohol the morning after drinking has taken place (see Thematic Report 1).

### Good Practice Example

#### Azienda trasporti Veneto Orientale, Italy

The Azienda trasporti Veneto Orientale public bus company<sup>26</sup> from Italy ran a campaign entitled: “Zero alcohol at work. Safety above all”. The aim was to promote abstention from consuming alcoholic drinks in the workplace, both before and during work, in order to prevent accidents, improve the working environment, reduce absenteeism due to health problems. It also aimed to improve shift organization and increase productivity and improve the image of the company. The campaign was realised with information channelled by displaying information posters at the offices of ATVO and on

24 [http://www.ilo.org/public/libdoc/ilo/1996/96B09\\_297\\_engl.pdf](http://www.ilo.org/public/libdoc/ilo/1996/96B09_297_engl.pdf)

25 [http://www.mensura.be/news\\_detail.aspx?id=4677&terms=alcohol+et+drogues](http://www.mensura.be/news_detail.aspx?id=4677&terms=alcohol+et+drogues) . Royal Decree of June 28 2009 that all employers must introduce a preventative policy for alcohol and drugs in their companies. Published July 2009.

26 EU OSHA Protection of Passenger Road Transport Drivers (2008)

its buses. Information sessions for bus drivers were given by experts from the Alcohol Related Operating Unit from San Donà di Piave, which deals with the prevention and treatment of alcohol dependency in the workplace. Leaflets were also distributed on alcoholic drinks and their effects, in particular in relation to driving buses.

### Recommendations to Employers

- Inform and educate employees about the risk of drink driving and adopt a Zero tolerance approach to alcohol in the workplace and whilst driving for work.
- Apply procedures and run programmes motivating drivers to comply with regulations.
- Develop clear written internal policies and procedures on drink driving and screening (e.g. before employment, after a collision and randomly) these should be an integrated part of general company workplace health promotion policies.
- Supervisors, line managers and drivers should be trained on the effects of alcohol on driving, and how to identify the symptoms of alcohol misuse.
- As part of a holistic road safety policy consider installing alcohol ignition interlocks in commercial vehicles.

## Part 4. Driving under the influence of illegal drugs and prescription medicine and Work-related road safety

### Scope of the Problem of driving under the influence of illegal drugs

The use of illegal is a cause for concern. The prevalence of illicit drugs in drivers killed in traffic accidents can be estimated in the order of 8.8% in Spain<sup>27</sup> and 8.1% in Sweden<sup>28</sup>. An increasing trend has been identified in the UK (24% in 2001 compared to 8.5% in 1989),<sup>29</sup> The Netherlands (15.7% in 2004 compared to 7.2% in 1985) and Norway (22.8% in 2002 compared to 12.4% in 1989) . The range

of psychoactive substances available for illicit use is widening, and the latest studies which look for evidence of their use in drivers are indeed finding it. Drivers are being discovered with a range of drugs in various subsets of the motoring population, whether while being tested randomly, upon suspicion, in hospital or after a fatal accident (ECMDDA Insights 8).

Drivers driving for work may, as for alcohol, still be under the influence of illegal drugs from an evening before. They may also have been or be taking legal or illegal drugs to counter sleepiness. As for alcohol time pressure, stress and peer pressure may lead to drug and alcohol use (Millies, 1998).

### Scope of Problem Medicines

The use of psychotropic medications (e.g. benzodiazepines, opiates) and some over the counter medicines (e.g. antihistamines, cough and cold remedies) whilst driving is also a cause for concern.

Medicines are generally used:

- Through a medical prescription, with the advice of a medical practitioner
- "Over the counter" in pharmacies or drugstores with the advice of a pharmacist/ collaborator by self medication, with only the recommendations printed on the package insert, plus an external warning printed on the box like in France (3 levels of warning), or Spain (1 level).

An increasing number of medicines are used without medical prescription and this evolution justifies the proposition of implementing a harmonised external warning on boxes of medicines inducing side effects on driving. In France this type of warning showed positive effects due to a better dialogue between patients and health professionals.

Much medicine influences the driving fitness by lowering concentration, alertness and reaction rate and can even be the cause for accidents (Deutscher Verkehrssicherheitsrat DVR, 2008). Field studies reveal that benzodiazepines are the most frequently detected medicines in all driver populations and

27 Del Rio et al. (2002) (Source: EMCDDA Report)

28 Holmgren et al. (2005).

29 Source: Sweedler and Stewart, 2009. (From SWOV Powerpoint)



some have concluded that using them approximately doubled the risk of motor accidents. In addition this risk was higher for drivers older than 65 (EMCDDA 1999). Also in some cases the fact that professional drivers don't have the possibility to consult a doctor while on the road may cause drivers to take over-the-counter medicines that may influence their driving activity.

## EU Level Legislation – Initiatives and Guidance

As part of the 3rd Road Safety Action Programme and in recognition of the growing problem of driving under the influence of psychoactive substances, the European Commission proposed a range of measures designed to improve and share information on driving under the influence of drugs. The DRUID project, reporting in 2011, aims to fill gaps in the knowledge base, thereby enabling the development of harmonised, EU-wide regulations for driving under the influence of drugs and medicine. Some work carried out so far on road-side oral fluid screening has led to recommendations on the need to develop devices and procedures to be used in road-side testing by the police.

## EU Level Legislation – Initiatives and Guidance. Illegal Drugs

The EU has legislated on the use or abuse of psychotropic substances which may affect physical and mental fitness to drive. Annex III of the Driving Licence Directive states that "driving licences shall not be issued to or renewed for applicants or drivers who are dependent on psychotropic substances or who are not dependent on substances but regularly abuse them".

Also in 2003, the European Council called on the Commission to ensure that the current programme

on road safety is followed up by a set of actions to combat the impact of psychoactive substance abuse on road accidents. Driving under the influence of drink, drugs and medicines is also targeted in the EU drugs strategy 2005-2012 and the EU drugs action plan 2009-2012.<sup>30</sup>

## EU Level Recommendation for Illegal Drugs in the Workplace

- Implement effective campaigns on the working place to inform about the danger of driving under the influence of illegal drugs.

## Prescription Medicines

For prescription medicines the Driving Licence Directive states that: "Driving licences shall not be issued to, or renewed for, applicants or drivers who regularly use psychotropic substances, in whatever form, which can hamper the ability to drive safely where the quantities absorbed are such as to have an adverse effect on driving. This shall apply to all other medicinal products or combinations of medicinal products which affect the ability to drive."

Most of the current information for patients to decide whether or not to drive is presented in medicine package inserts. However this information is not clearly stated with advice as to when not to drive or how to decide whether driving is possible under treatment. There is a need to improve this information to the patient: a new categorisation system proposed by the DRUID researchers and recently accepted by the European Medicines Agency is available.<sup>31</sup>

In order to have this information accessible for patients in the correct way, health care providers should play a significant role in ensuring that the patient can make the best use of the medicines without endangering their participation in traffic. Therefore there is a need

30 [http://ec.europa.eu/justice\\_home/fsj/drugs/strategy/fsj\\_drugs\\_strategy\\_en.htm](http://ec.europa.eu/justice_home/fsj/drugs/strategy/fsj_drugs_strategy_en.htm)

31 "4.7 Effects on ability to drive and use machines . On the basis of the pharmacodynamic and pharmacokinetic profile, reported adverse reactions and/or specific studies in a relevant target population addressing the performance related to driving and road safety or using machines, specify whether the medicinal product has a) no or negligible influence, b) minor, c) moderate influence or d) major influence on these abilities. Effects of the disease itself on these abilities should only be discussed in exceptional circumstances. Other important factors that affect the liability to drive and use machines should be considered if relevant, e.g. duration of the impairing effect and the development of the tolerance of adverse reactions with continued use. For situations b, c, and d, special warnings/precautions for use should be mentioned." European Medicines Evaluation Agency in article 4.7 of the Summary of Product Characteristics (SmPC) <http://www.ema.europa.eu/>

to implement prescribing and dispensing guidelines to improve the medical and pharmaceutical practices based on the application of the categorisation system.

One way to establish a safe use of driving impairing medicines is the application of a clear labelling system, e.g. the use of pictograms in the medicine box and in the leaflet, as proposed by the DRUID research team.

### EU Level Recommendations on Prescription Medicine

- Develop a drugs and driving code of practice to enable health professionals to provide advice to the public about the likely effects of medication on driving.
- Work towards an appropriate classification and labelling of medicines that affect driving ability.
- Implement prescribing and dispensing guidelines to improve the medical and pharmaceutical practices based on the application of the categorization system.
- Implement specific guidelines following which drivers under medical treatment asked to operate their vehicles should be considered by the workplace occupational physician in order to adapt either treatment or working conditions.
- Implement effective campaigns on the working place to inform about the danger of driving under the influence of prescription medicines.

### National Level – Good Practice examples of government initiatives

Countries have tightened their laws as regards drug driving in the past decade, increased penalties or altered national road safety or drug strategies to address the problem (EMCDDA, 2007). However, individual countries' legal responses to drug-impaired driving vary greatly, from zero-tolerance laws (sanctioning detection of the substance per se) to impairment laws (sanctioning if the person is deemed unfit to drive). Possible penalties are also

markedly different between countries<sup>32</sup>. There are many factors to be taken into account including the availability of practical and reliable drug testing, the impact of drugs and driving on public safety and countries' attitudes towards consuming illegal drugs.

Prevention programmes that address drugs and driving are in place in the form of training in driving schools as well as various public safety campaigns, though these may not always be effectively targeted.

### Workplace drug testing

Much of the legal framework, where it exists at all, comes from interpretations of a combination of various national laws, including those on Labour Codes, privacy, data protection, and health and safety at work according to an overview compiled by the ELDD<sup>33</sup>. Only Finland (2003), Ireland (2005) and Norway (2005) report legislation that clearly and specifically addresses the issue of drug testing in the workplace. There is often a clearly qualified level of risk / response, though qualified in various different ways: many countries state that testing can take place when there is a health, safety or security risk or when there is suspicion of drug-taking.

### Recommendations from ETSC to Member States on Illegal Drug Driving

- Disseminate effective information on the effects of illegal drug driving.
- Ensure that drivers are aware that driving after use of illegal drugs will lead to detection and severe sanctions.

### Recommendations from ETSC to Member States on Prescription Medicine Use

- Disseminate effective information on the effects of driving under the influence of prescription medicines.
- Stress the role of doctors in advising drivers on the impact of prescription medicines on driving.
- Support a better communication between

32 ELDD Topic overview [http://emcdda.europa.eu/publications/legal reports](http://emcdda.europa.eu/publications/legal%20reports)).

33 <http://eldd.emcdda.europa.eu/html.cfm/index16901EN.html>

patient, company and health professional, for instance developing a card for professional drivers or employees in dangerous workplaces, informing the patient and the health professional about special precautions required by their working or driving situation.

- Take measures to control the use of stimulants in professional drivers through harmonisation and regulation of their prescription and delivery procedures across Europe.

### Employer Level

As for alcohol, employers of commercial drivers have an important role to play about the risks of drug driving. Employers and fleet operators should be strongly encouraged to set up their own initiatives and written internal policies to tackle the risk of drug-driving. As mentioned previously, in Belgium. All companies are obliged to develop and integrate in their working place rules a preventative policy for drugs and alcohol. This could follow a five step approach elaborated as for alcohol and follow the guidance of the ILO's Code of Practice on Management of Alcohol and Drug-Related Issues in the Workplace<sup>34</sup>. Equally this policy for drugs should also be developed in discussion with the employees. The aim would be to spread a Zero tolerance approach to illegal drug taking whilst driving for work. Employers should take measures, e.g. information, education, training and the improvement of working conditions, to prevent alcohol- and drug-related problems from occurring in the workplace.<sup>35</sup> It should also be made clear that where the use of medication may result in significant impairment, the individual should consult a doctor and give notice to the supervisor according to normal procedures for absence for health reasons. Specific conditions under which drivers are asked to operate their vehicles should be considered by the occupational physician in order to adapt either treatment or working conditions. Employers also have a responsibility to create and maintain a safe working environment and employees have a responsibility to adequately inform their employers about their health and the consequent use of prescription medicine.

### Recommendations to Employers on Illegal Drugs

- Adopt a Zero tolerance approach to illicit drug use in the workplace and whilst driving.
- Develop clear written internal policies and procedures on illegal drug driving and screening (e.g. before employment, after a collision and randomly) these should be an integrated part of general company workplace health promotion policies.
- Supervisors, line managers and drivers should be trained on the effects of illegal drugs on driving, and how to identify the symptoms of illegal drug misuse.

### Recommendations to Employers on Prescription Medicines

- Inform employees on the effects of prescription medicines whilst driving.
- Develop clear written internal policies and procedures on prescription medicine.
- Supervisors, line managers and drivers should be trained on the effects of prescription drug use on driving, and how to identify the symptoms of prescription drug use.
- Set up a procedure to adapt working conditions to workers who have been prescribed medicine that causes impairment, with the involvement of the occupational doctors.

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34 [http://www.ilo.org/public/libdoc/ilo/1996/96B09\\_297\\_engl.pdf](http://www.ilo.org/public/libdoc/ilo/1996/96B09_297_engl.pdf).

35 [http://www.ilo.org/public/libdoc/ilo/1996/96B09\\_297\\_engl.pdf](http://www.ilo.org/public/libdoc/ilo/1996/96B09_297_engl.pdf)

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# "PRAISE": Preventing Road Accidents and Injuries for the Safety of Employees

June  
**10**  
Fact Sheet  
**3**

## ETSC interview with Fredsø Vognmandsforretning



ETSC's PRAISE project, "Preventing Road Accidents and Injuries for the Safety of Employees" aims at mobilising knowledge needed to create work-related road safety leadership. The project aims to advance the awareness of the need for work-related road safety management and provide the know-how to employers who have to take on that challenge. It also aims to present the work-related road safety standards of road safety champions, by presenting employers' success stories, notably through the PRAISE Fact Sheets. This Fact Sheet follows from ETSC's PRAISE report 3 on "Fitness to Drive" published in May 2010.

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## Fredsø Vognmandsforretning Introduction

Haulage company Fredsø Vognmandsforretning, based on the island of Mors in Denmark's North Jutland region, has bought and installed alcolocks in all of its trucks: 25 in all.

ETSC has interviewed the cheerful and humorous Haulage contractor Benny Nielsen to get the inside story on Fredsø Vognmandsforretning's initiative, and understand how even a small haulage company can invest into road safety. Fredsø Vognmandsforretning's decision to install alcolocks also demonstrates that despite a good safety records there is no room for complacency and there is always room to introduce new safety measures to be on top of the game.

Benny Nielsen from North Jutland in Denmark doesn't mind taking the lead – especially when it serves a good cause. The background is rather gloomy: in Denmark every year approximately 10,000 drivers are found guilty of drink driving and 100 people die in accidents involving drink driving.

"We don't want to be part of those appalling statistics, and that's the signal we send through this initiative: alcohol and haulage don't mix" says Nielsen.

The attitude towards drink driving is clear: according to a new survey from Gallup, 73% of the Danish population want the installation of alcolocks to be mandatory and 89% feel that it should be a compulsory installation in commercial vehicles.

With alcolocks installed in vehicles it's the BAC-limit (Blood Alcohol Content) that decides whether the truck starts. The driver has to blow in a handheld unit with a built-in nozzle and wired to the dashboard. Every driver has his own private nozzle. If the driver's breath doesn't remain within the alcolock's BAC-limit the truck can't start. It's simple and effective.

Interview with Benny Nielsen

## Road Safety management at Fredsø Vognmandsforretning

1. Can you provide any figures tracking your safety performance over the years?

In the company we have very fine accident statistics. You have to go back to 2005 to find the last registered accident. It concerned a truck in Sweden crashing because one of its front tires exploded causing it to drive out over a cliff. Nothing happened to the driver and later it was established to be bad tire quality that caused the accident. The Institute of Technology confirmed this and we didn't lose any bonus from the insurance company. In 2001 we had an inattentive driver that ran into a car that suddenly slammed the breaks because of a dog on the road. Also in this case there was only material damage - fortunately. We have approximately one accident every 10th year and we have never been involved in traffic accidents with a deadly outcome.

2. How are the transport safety decisions at Fredsø Vognmandsforretning taken?

In the company we have an open dialogue with our drivers concerning the implementation of new safety measures. We're happy that they get involved. We also select our drivers very carefully. We also keep an open dialogue with our insurance company but mostly because we want to lower our insurance premium due to our new safety measures.

3. What is the leading cause of road collisions or risk factor your company is exposed to on the roads?

The biggest risk factors on the road are the tractors and caravans. We have to overtake them on the road



because they drive slowly, but shifting lanes is dangerous. Wet and slippery roads are not a big problem for us as we make a point to regulate the speed according to the weather conditions as part of our journey planning, and we have no problem doing this.

#### 4. How did you come to that conclusion?

Through a simple process of drivers reporting back to us.

#### 5. Do you think that transport companies have a duty to go beyond the legislation regarding traffic safety of the country in which they operate?

In some situations you may go even further than the legal framework if you think it is a good idea. But as a minimum I think that everyone should anticipate the legislation. We decided to install alcolocks in all our trucks in great part because we want to be prepared to meet future requirements in this area. I believe that alcolocks will be required by law within a few years, and we are now ready to satisfy any such law.

I also believe that it's very important that you have the same legal requirements regarding safety all over Europe. This will make the competition fairer and improve accident statistics internationally.

#### 6. What would you say are the main drivers/reasons for your company's efforts in road safety?

There are three main reasons for us: to prevent accidents to occur and improve our accident statistics, to save money, and to achieve a good image in the industry.

#### 7. How do you recruit your drivers?

We don't seek them through advertising in the papers. They're usually recruited by recommendation from one of our drivers. It is often a friend from the driver's social circle. In this way we know that they're qualified for the job. They're experienced, dutiful and reliable. We're very satisfied with our drivers.

#### 8. On what do you base your decisions for your vehicle purchase selection?

We drive a well-known brand of trucks with many good safety measures. We also have a good working collaboration with the local dealership of that brand. We also aim for a reasonably new fleet of trucks with all the new safety measures – ABS, EBS, Dynafleet (an online Transport Information System that allows to see in real time the current location of vehicles, their fuel consumption, messages, driver times, service intervals etc.) etc. We choose to install all the safety features that we possibly can.

### Questions about alcohol and alcolocks

#### 1. What are the main elements of your company's policy to prevent drink driving?



We have a clear alcohol policy. Alcohol on the workplace leads to immediate dismissal. We do not interfere with what the employees do at home but at the workplace alcohol is completely banned.

#### 2. How is your company working with alcolocks?

We have alcolocks installed in all of our trucks, they are adjusted to a BAC limit of 0.2 (below Denmark's legal 0.5 limit) that people taking medicine (such as cough syrup for example) aren't prevented from starting the truck. We have observed some cases where a BAC limit of 0.0 resulted in problems for drivers taking cough syrup: their trucks did not start when they breathed in the alcolock. They had to drink water and wait a bit before the truck would start.

### 3. How do you prevent drivers from circumventing the alcolock?

We can observe on our fleet steering program Dynafleet if the alcolock has been switched off or short-circuited. In that case Dynafleet gives a signal to the workshop when the truck is at service.

### 4. When did you start and how many alcolocks are there now being used?

About three months ago we installed the alcolocks in all of our 25 trucks.

### 5. What motivated you to start?

We really wanted to send a signal to our customers that we take traffic safety seriously. It is imperative for us to let our customers know that their goods are in safe hands when we transport them. Customers view this as one more guarantee that their goods will be delivered safely. The installation has nothing to do with a previous alcohol problem in the company.

### 6. Who did you contact to help you introduce alcolocks in your fleet / how did you identify a supplier?

I had the idea of installing alcolocks in all our trucks during a conversation with the Service Manager of the brand of trucks we are using. He told me about the principle of this system. A decisive point is that alcolocks are quick and easy to operate which made me decide together with employees from the company to install alcolocks in all of the trucks.

### 7. What is the procedure if you identify a drunk driver?

If a driver shows up drunk at work he is dismissed. It is as simple as that.

### 8. How many cases of drink driving have you ever had?

We have had two drivers who drove with excess alcohol in the blood and they were both dismissed as soon as I found out. There's nothing to discuss and the cooperation ends immediately.

### 9. What has been the opinion of the drivers? Are they supportive?

The drivers have embraced the initiative with alcolocks in all the vehicles. Some were a bit sceptical at first but today they're pleased about it. There can never be any doubts concerning the driver's way of driving or acting. Alcohol can never be suspected of being the cause in case of an incident, this is reassuring for drivers.

### 10. What have been the lessons learnt and what would you advise to other companies considering going forward with this?

You have to inform the employees and make sure to get support to go through with it. It's also equally important to inform the customers. Up until now we only have positive things to say about alcolocks. They work, are easy to operate and have given our company a lot of good publicity in trade journals, local newspapers and magazines. Also it's a relatively little investment to install alcolocks.

### 11. Would you like to see further steps from the Danish authorities in the prevention of drink driving?

We would be happy with a more restrictive alcohol policy in Denmark in particular concerning young people driving cars who do not always have the necessary respect regarding drink driving. More campaigns and alcohol controls would be welcome too.

## The Business Case

1. Have you calculated the financial benefits that have or will result from your investments in road

safety in terms of the avoidance of collisions and casualties?

We haven't made any exact calculations but we are certain that we are saving money having a high safety policy in which we save fuel, damages, days lost through illness etc.

2. Do you feel that your customers are reassured by knowing that you have strong safety standards? And how do you communicate that to your customers?

We know that our customers are happy and satisfied with our measures. It's not only the price they're concerned about but also the company's way of showing responsibility and being safety and quality minded. We inform about our initiatives by word of mouth but in the case of the installation of alcolocks we also released material to the press which created a lot of good publicity.

3. How do you feel that you perform compared to your competitors concerning road safety?

We stand strong in the competition and have a clear opinion regarding haste and speed. We don't want to be pressured into doing our job in a hasty manner because it can result in safety breaches. We want decent working conditions to ensure safety.

## Other Areas

1. Are there other sources of collision/casualties that you try address?

It's important to drive within the speed limits especially in the cities. This is pointed out to our drivers as well as the banned use of mobile phones while driving. If a driver gets a speeding ticket they're told to pay it themselves and not to let it happen again. I know that our drivers keep within the speed limits because they do not receive any

speeding tickets, it's as simple as that!

2. Do you have a way of controlling your drivers' speed?

If we want to check if a driver has been speeding we can use Dynafleet and the driver's tachograph chart.

3. Do you have a way of ensuring your drivers wear their seat-belts?

When the safety belt isn't put on the system gives a warning signal. It reminds the driver to remember to put it on. It works very well.

4. Do you have a driver training scheme in place? How are your drivers trained?

We take all the mandatory courses and arrange driver evenings where we discuss trucks, driving technique, maintenance, etc. We also have our drivers attending different technical driving facilities to train them in different situations – such as driving on wet or slippery roads.

5. Do you explain to your drivers the importance of being fit to drive (healthy lifestyle, healthy diet, enough sleep, etc...)

We do not interfere in the driver's spare time but everyone knows that they have to be well rested and upbeat when the work day begins. That is the essence of our drivers. We have 0.01 percent days lost through sickness. We are very satisfied with this.

ETSC would like to thank Benny Nielsen for his precious contribution. Questions can be sent to: [jaa@john-aagaard.dk](mailto:jaa@john-aagaard.dk)



# “PRAISE”: Preventing Road Accidents and Injuries for the Safety of Employees

## Safer Commuting to Work

PRAISE is a project co-funded by the European Commission and implemented by ETSC on Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE). The project aims to advance work-related Road Safety Management and provide the know-how to employers who have to take on that challenge. It also aims to present the work-related road safety standards of EU Member States and carry out advocacy work at the EU level: work-related road safety is an area of road safety policy that clearly needs renewed political commitment.

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## Introduction

PRAISE is an EC co-funded project run by ETSC on Preventing Road Accidents and Injuries for the Safety of Employees (<http://www.etsc.eu/PRAISE.php>). The project aims to advance work-related Road Safety Management and provide the know-how to employers who have to take on the challenge of reducing road risk for their employees. This fourth thematic report aims to present how measures taken by employers to mitigate the commuting risk of their employees can improve road safety. It gives an overview of the scale of commuting related road deaths within the EU and the legal responsibility to make commuting safer in different countries. It then introduces travel plans which include parts on commuting and presents tips on how to set these up. It then examines each different mode, the associated risk and measures that can be undertaken mostly by employers themselves as well as local and central government. It also covers other related issues that affect commuting and road safety such as land use planning and site location and flexible hours and shift work. There is finally a section giving an overview of what can be done by national governments and the EU to promote employers' taking initiatives to improve safety of their commuting employees.

## 1. The Business Case

Duty of care, health and safety compliance are legal necessities in most EU Member States, and are an essential consideration for employers. In some countries employers have a legal obligation to compensate, through their insurance, road traffic collisions also occurring during commuting time (see France for example in the section below on national initiatives). This means that they also have a very strong interest to apply measures to prevent these collisions from occurring. In many workplaces, the trip to and from work is the most risky part related to occupational safety. This is the case for instance in office work. Commuting accidents also lead on average to longer absences from work compared to other occupational accidents. Moreover, it most often also makes sound business sense to draw up and implement a travel plan that covers safety of employees commuting to work.

Employers can benefit from Travel Plans through:

- Reduced costs and time spent on commuting and business travel
- More cost-effective car parks and reduced congestion around the site
- More effective use of land (through reduced car parking)
- Higher staff retention and recruitment and improved staff fitness levels
- Protection of the environment and enhancement of the company's image with the community and the clients

- Improved productivity
- Improved staff health and reduced absenteeism.
- Reduced journey times to work and improved staff punctuality by reducing congestion delays and supporting more reliable means of transport.

Travel Plans that apply safety measures to reduce risk whilst commuting can also lead to:

- Fewer working days lost due to injury;
- Reduced risk of work-related ill health;
- Reduced stress and improved morale / job satisfaction;
- Less need for investigation and paperwork;
- Less lost time due to work rescheduling;
- Fewer missed orders and business opportunities, reduced risk of losing the goodwill of customers.

Travel plans often involve only limited capital expenditure, on items such as new cycle shelters, footpaths, bus stops or car park barriers. Mostly they concentrate on improving existing travel choices whilst giving the incentives to use more sustainable travel and disincentives to solo car use. This is backed up by information campaigns to inform staff about travel alternatives that offer them realistic options. Good travel plans have typically succeeded in cutting the number of people driving to work by 15% (DfT 2002).

## 2. Commuting overview

At present there is little data covering commuting accidents in the EU Member States and this remains somewhat of a grey area. Some countries do not collect such data, or are only starting to collect it (by including "purpose of journey" information in traffic accident datasets). It is therefore difficult to compare road risk while commuting across the whole EU. However, data for a number of countries are available, and this can be used to demonstrate the importance of this topic. A report from 2009 on occupational road safety including collecting and comparing work related road safety data from five EU Member States was published by Eurogip<sup>1</sup> and suggests that commuting is an important road safety risk factor that organisations should focus on as part of their occupational road safety programs to protect the safety and wellbeing of workers.

<sup>1</sup> Eurogip is a public interest grouping (GIP) set up in 1991 by the Occupational Injuries and Diseases Branch of the French Social Security system

Country	Year	Commuting road accidents as % of fatal occupational accidents	Number of commuting deaths	Number of commuting deaths on the road (and % out of all modes)
Austria	2007	32.3%	62	62 (100%)
Belgium	2007	36.6%	79	64 (81%)
France	2007	34%	407	350 (86%)
Germany	2008	41.5%	475	463 (97.5%)
Spain	2007	26.1%	341	305 (89.4%)

Eurogip (2009)

This report makes very clear the fact that commuting accidents are a very significant proportion of all fatal occupational accidents, and that most commuting accidents are, unsurprisingly, road accidents.

In Germany more recent data show that in absolute terms, reportable occupational accidents numbered 886,122 in 2009, 8.8% fewer than in the previous year. The number of reportable commuting accidents rose slightly to 178,590, an increase of 1%. New disability pensions resulting from an occupational or commuting accident numbered 22,534. The occupational accident insurance institutions recorded 456 fatal occupational accidents and 362 fatal commuting accidents<sup>1</sup>.

The issue of commuting accidents and their impact on the workers' compensation system was also reviewed in detail for Germany and several other countries in an earlier report by the Munich Re Group (a reinsurance company) in 2004. The report concluded that commuting accidents are a financial drain on the worker compensation systems due to their higher frequency and severity. The commercial Motor Third Party Liability might also be affected in case neither the employee nor the company car was damaged, but only the Third Party. The report also cites that as populations decentralise and travel further distances to work, commuting collisions increase as a proportion of the road toll in many countries. It found that:

- 45% of deaths and 10% of occupational accidents in Belgium involve commuting.
- 45% of deaths and 13% of occupational accidents in Finland involve commuting.
- 47% of deaths and 10% of occupational accidents in France involve commuting.
- 43% of deaths and 15% of occupational accidents in Germany involve commuting.
- 21% of deaths and 6% of occupational accidents in Italy involve commuting.
- 16% of deaths and 6% of occupational accidents in Portugal involve commuting.
- 29% of deaths and 8% of occupational

<sup>1</sup> Source: German Social Accident Insurance [http://www.dguv.de/inhalt/zahlen/au\\_wu/wu/toedlich/index.jsp](http://www.dguv.de/inhalt/zahlen/au_wu/wu/toedlich/index.jsp)

accidents in Spain involve commuting. However, comparisons between countries are difficult because of very different legal definitions of commuting accident. While in some countries this is very broad and detailed, other countries have a very narrow definition. For example a very detailed and encompassing definition is the one in France where it is considered that an accident is a commuting accident if it occurs (CNAMTS<sup>2</sup>, 2004 / MRG 2004):

1. Between the first place of residence, or a secondary place of residence that has a 'stability character', or any other place where the employee goes regularly for family purposes, and the place of work. The route to work may not be the most direct one when it is necessary to take a longer route as part of a car sharing habit.
2. Between the place of work and the restaurant, the canteen, or in general where the employee usually takes his/her lunch, and as long as the journey has not been interrupted or modified for any other personal purpose unrelated to any everyday life necessity or work related necessity.

In practice this means that an accident will be considered a commuting accidents even when an interruption or detour is justified by the essential requirements of everyday life. This includes buying food, obtaining medicines, drawing money from a cash dispenser or posting a letter. Detours and interruptions that are in some way connected to work are also included. Someone who regularly gives a colleague a lift home, buys work equipment, organises flowers for a staff party or visits the doctor following an accident at work, is therefore covered under the insurance (MRG, 2004).

In contrast in Spain the legal definition is worded very concisely and merely states that an accident suffered by a worker on his/her way to or from work will be treated in the same way as an occupational accident. The following conditions are laid down:

<sup>2</sup> CNAMTS is the French National Health Insurance Fund for Salaried Worker.

1. The “normal” journey between the place of residence or usual starting point and the place of work.
  2. The shortest and most suitable journey.
- Detours are only covered if the employee can give good reasons such as traffic jams, or avoiding a dangerous route (MRG, 2004). Portugal is also an example of a country where the law interprets commuting accidents very narrowly (MRG, 2004). In Germany commuting accidents are defined by the law covering insurance for work. These are accidents that occur on the most ‘direct’ route between home and the place where the insurance is taken out, this is mostly the place of work but this can also include school. The direct route choice is left open thus the driver can decide depending on geography or time and can also choose mode: car, public transport or bike.

To gain a better understanding of the different national regulatory and legal frameworks covering the issue of work related safety, and in order to provide information needed for comparative analysis at EU level, ETSC conducted a survey involving the 27 Members States and Switzerland in the context of the PRAISE project. On commuting the following question was asked: “If a vehicle is used for commuting, is Germany: Fatal commuting accidents by sector and branch of industry<sup>1</sup>

	2006	2007	2008	Change in %
Accident insurance in industrial sector	475	460	412	- 10.43
of which in branch of industry				
Mining	1	1	2	x
Pit and quarry	9	7	3	x
Gas, district heating and water	2	2	3	x
Metal	68	64	53	- 17.19
Electrical/precision engineering, textiles, leather	42	38	51	+ 34.21
Chemicals	21	20	18	- 10.00
Timber	13	11	6	- 45.45
Paper and printing	14	8	6	x
Foods	44	51	34	- 33.33
Construction	45	47	46	- 2.13
Commerce and administration	140	149	129	- 13.42
Transport	34	29	21	- 27.59
Health service	42	33	40	+ 21.21
Accident insurance in public sector	60	43	46	+ 6.98
Total	535	503	458	- 8.95

The table below shows the number of fatal commuting accidents by sector and industry branch between 2006 and 2008.

German statutory accident insurance association

[http://www.dguv.de/content/facts\\_figures/au\\_wu/wu\\_toedlich/index.jsp](http://www.dguv.de/content/facts_figures/au_wu/wu_toedlich/index.jsp)

\* Source: German statutory accident insurance association [http://www.dguv.de/content/facts\\_figures/au\\_wu/wu\\_toedlich/index.jsp](http://www.dguv.de/content/facts_figures/au_wu/wu_toedlich/index.jsp)

this also covered in the employer’s risk assessment?”. Twenty one countries responded to this question (at the time of publication): 13 answered No (Czech Republic, Belgium, France, Greece, Latvia, Lithuania, Netherlands, Poland, Slovakia, Spain, Sweden, Switzerland, UK) and 8 answered Yes (Austria, Cyprus, Estonia, Finland, Ireland, Luxembourg, Romania, Slovenia). Hence, in a number of countries (8) there is a legal obligation to include commuting in the risk assessments that have to be conducted according to occupational health and safety legislation. Commuting accidents are not covered by occupational injury insurance in the Czech Republic, Latvia, the Netherlands, Slovakia and the UK. However, out of the countries that answered “No”, 4 of them commented that when the vehicle belongs to the employer then it also has to cover commuting in its risk assessment (France, Greece, Lithuania, Poland).

The German Social Accident Insurance is a branch of Germany’s social insurance system. The responsible institutions, i.e. the accident insurance institutions for the private and public sectors, insure around 75 million people in Germany against occupational and commuting accidents, accidents in educational establishments, accidents suffered by volunteers, and occupational diseases.



The modal split for commuting is also a source of information that can be of tremendous help for making policy decisions, and Member States but also employers should be encouraged to run surveys to learn more about the modes commuters use. For example a survey conducted in Finland indicates that the car is still by far the preferred commuting mode in that country. It also shows that most commuters by car are drivers (only about 6% of commuters are car passengers compared to 61.5% who are car drivers) emphasising significant room for improving car pooling.

Commuting trips	Of all commuting trips	Of distance travelled to commute
Walking	8.8 %	0.9 %
Cycling	10.3 %	2.8 %
Bus, coach	6.6 %	7.3 %
Train	2.1 %	3.8 %
Metro, tram	1.7 %	1.1 %
Taxi	0.2 %	0.2 %
Aeroplane	0.0 %	0.0 %
Ferry	0.0 %	0.0 %
Car (driver)	61.5 %	73.2 %
Car (passenger)	5.9 %	6.2 %
Other private motorised	3.0 %	4.5 %
Total	100.0 %	100.0 %

Source: The Finnish National Travel Survey 2004-2005  
[http://hlt.fi/english/results/6\\_21\\_mode.xls](http://hlt.fi/english/results/6_21_mode.xls)

Data about the causes of commuting accidents are also scarcely available but would be of great help to inform policies and actions on commuting safety. Risk factors such as fatigue, stress, alcohol (morning after effect), and speed (rushing to be to work on time) might be particularly relevant when considering commuting accidents. Only for a few countries do we have data for the causes of commuting accidents. The example below for Finland indicates that fatigue is the leading risk factor while commuting in that country.

Falling asleep, reduced alertness	15.0 %
Fitness (sudden attack of illness)	11.6 %
Failed to perceive the other party/situation	11.6 %
Incorrect line of driving (approaching the bend, etc.)	11.0 %
Incorrect estimation of own possibilities of moving	8.7 %
Incorrect manoeuvre (sudden, slow, etc.)	8.7 %
Combination of incorrect manoeuvres	8.1 %
Others	25.4 %

Source: Fatal accidents investigated by the Finnish road

accident investigation teams (2002-2008) Finnish Motor Insurer's Centre, Traffic Safety Committee of Insurance Companies VALT.

## 2.1. Working Hours and Commuting Risk

A study conducted in Germany (Geiler, Musahl, 2003) revealed that the risk to be involved in a commuting accident is double during darkness and early morning hours. Between midnight and 5:59 AM 1.8 more drivers per 1 Million km driven are involved in a commuting accident than between noon and 19:59 AM. Beside the factor of fatigue, the survey conducted in the context of the study showed that the drivers have the subjective feeling to be less at risk due to less traffic during night commuting. Due to darkness, often the weather conditions and the traffic and road circumstances are not interpreted in an appropriate way by the drivers.

The study showed also that the risk is higher for young commuters until 25 years of age (2.5 higher than for commuters between 25 and 50 years) and for women. Women are frequently involved in pedestrian accidents (including accidents where they trip, which are also registered as commuting accidents but are not real traffic accidents). Men have a higher risk as women while using bicycles for commuting. As car drivers, women are higher at risk, probably because they tend to use smaller cars, they have shorter trips but more on rural roads which are more dangerous.

A subsequent study undertaken by Geiler and Pfeiffer in 2007 showed a relationship between the amount of working hours and the accident risk while commuting. Commuting after a very short working period and after 6-8 hours of working time represents a high risk to be involved in an accident. This can be attributed to the fact that women, who have a higher risk to be involved in commuting accidents tend to work less hours as they are more likely to hold part-time jobs. Also after 7 to 8 hours of working time, the employees commute during the rush hours which are more risky. For working time between 9 and 13 hours the commuting accident risk is much lower.

Commuting also depends on the personal situation of the employee. The higher the income the longer the average commute and the own car is chosen as transport mode. Part time workers are less ready to take on long journeys. Women's average commuting time is shorter than men.

Data indicate that the most significant amount of time people spend on the roads is for getting to or returning from work, hence reinforcing the point for improving commuting safety.

## 2.2. Aggravating trends?

As already noted, the risk of being involved in commuting accidents might be increasing as populations decentralise and choose to live further away from work. Data from the Fourth European Working Conditions Survey (Eurofound, 2005) on “commuting time”, an indicator defined as the percentage of workers living 20 minutes or less away from work, demonstrate that the percentage of workers living more than 20 minutes away from work has increased.

Countries	2000	2003	2005
AT	27	24	35
BE	33	28	23
BG		32	24
CY			24
CZ		30	26
DK	28	26	23
EE		34	15
FI	31	23	25
FR	27	23	23
DE	32	28	12
EL	25	21	31
HU		30	26
IE	34	21	26
IT	24	21	31
LV		26	17
LT		35	18
LU	25	16	22
MT		16	25
NL	30	33	19
PL		34	31
PT	34	21	33
RO		34	22
SK		26	21
SI		28	29
ES	34	27	25
TR		34	30
UK	30	24	23
EU-15	30	25	22
EU-25		26	23

Percentage of workers living 20mins or less away from work (Eurofound, 2005).

Commuting time however is not the same as distances, nor does these data tell us the modes that people choose to use to commute. While it is therefore difficult to infer from such data the precise change in exposure to road risk

while commuting, it can be assumed that decentralisation and urban sprawl have a negative impact on commuting accidents.

Another risk factor to be aware of is the increase in the use of two wheelers (bicycles, mopeds, motorcycles) that are environmentally less harmful than the passenger car, but suffer from a higher risk (see section below on Powered Two Wheelers and cycling). In the centre of Paris, for example, the number of people using PTWs has increased by 50% over the past ten years while at the same time the number of people using public transport has decreased by 16%. In the whole of France 50% of people who use PTWs to commute to work were previously commuting with public transport, whereas only 25% of them previously used an individual transport mode (Comité de Pilotage pour la Prévention du Risque Routier Professionnel, 2009).

In Germany, every 4 years the Federal Statistical Office undertakes a survey regarding the commuting behaviour of employees<sup>1</sup>. The last survey from 2008 showed that 62% of employees travel to work by car or motorbike. Corresponding to high levels of public transport the numbers who drive to work are lowest in urban areas. Cycling and walking to work is higher in the east German regions. Cycling and walking is also lower in urban areas where many commuters make use of public transport. The number of cyclists and pedestrians relates to commutes of under 10km. Also less cycle and walk if their income is higher. The use of public transport varies between 8 and 42% in the different regions.

## 3. Risks across the modes

Road travel has by far the highest death risk per distance travelled. Rail and air travel are the safest modes per distance travelled, followed by bus. The passengers of trains, bus/coach and planes within the EU have the lowest death risk per passenger kilometer. For the average passenger trip in the EU, bus travel has a 10 times lower death risk than car travel (ETSC 2003).

## 4. Employee Travel Plans including Commuting

### 4.1. What is a Travel Plan

A travel plan is a package of practical measures to reduce the cost and environmental impact of work-related travel by offering staff realistic and cost-effective alternatives to their car (Derbyshire 2008). Travel plans promote flexible and sustainable transport solutions, such as car share schemes, working from home and cycle facilities, tailored to businesses’ individual needs but they are not anti car. When drivers were surveyed

<sup>1</sup> [www.destatis.de](http://www.destatis.de), Mikrozensus 2008

in the UK, about half said they wished to drive less and of these, over a third said they had already made some effort to curtail their car use (Scottish Executive 2006). Thus travel plans primarily work with this group of the willing. Cars are still part of the picture, but the idea is to cut their unnecessary use where alternatives are easily available (DfT 2008). A travel plan is about encouraging people to use cars more wisely and offering them better alternative travel choices. Travel plans should also include the encouragement of safe and fuel efficient modes of transport. Travelling less while still doing the same amount of business, cuts fuel use, fleet risks and operational costs (Murray 2010).

### 4.2. Commuting as part of a travel plan

A travel plan should include a specific part on commuting. The goal of this part would be to decrease the amount of individual traffic created by movements between home and work. The plan generally has three parts.

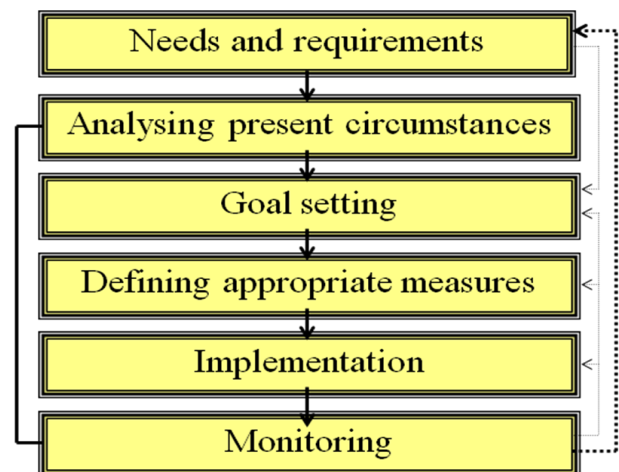
- A commuting and access profile is drawn up: who is coming to work, when and by which mode of transport? What is the public transport situation close to the company? What are the key bottlenecks in terms of transport for the company?
- A number of viable alternatives are suggested: better access to public transport; the promotion of more collective forms of transport, such as car-sharing or transport organised by the company and better facilities to promote the use of bicycles.
- The social partners negotiate and work out the details of the alternative options, going into the nature of the arrangements decided and defining the practicalities for the company.

Commuting schedules should be adapted as far as possible to encourage compliance with speed limits, working time regulations, and avoiding times when falling asleep at the wheel is possible. Commuting schedules alongside other journeys should be optimised to minimise the need to travel, journeys should also be shared or consolidated and public transport should be used wherever practical. Journey planning software can be used to optimise journeys. Route planning of commuting could then identify and evaluate issues such as terrain and infrastructure. Traffic conditions (which can vary as regards time of day) should also be taken into account. Moreover, weather conditions and seasonality (such as light and darkness) are also issues to be considered when choosing the route. Driver stress and fatigue can also affect driving and route choice and should be taken into account.

### 4.3. Staff Involvement

Senior management support for the travel plan is crucial. With management backing staff time can be allocated to develop, promote and run the plan and a budget can be secured. One person should be made responsible for the overall coordination of the travel plan. However, management will need to consult widely to gain the support and views of others in the organisation, for example via a travel plan steering group. To succeed, a travel plan must gain the acceptance of staff, through consultation and active involvement to help foster a sense of ownership. Employers should publicise all new initiatives, and successes. Also, to maintain the interest, they should use a variety of approaches to present their message. Above all they need to make sure that all staff know about the travel plan and what sustainable travel options are available to them.

### 4.4. Model to increase safety and reduce environmental risks in commuting and work related traffic



This is the model developed in a Finnish Study (Pollanen et al., 2003) to increase safety and reduce environmental risks in commuting and work-related traffic. A similar model is used for many developments in companies. The process is started by a sort of need or a requirement. This can come for instance from changes in legislation, from company's strategy or from problems which need to be resolved. The process continues with analysing what the situation is at the moment: how many accidents occur, how many kilometres are travelled daily by company cars, what are the safety and environmental characteristics of the fleet. Goal setting includes both goals for safety and environment (such as reducing fuel consumption) as well as getting the company committed to these goals. The next step is to define the appropriate measures. The two last phases are implementation and

monitoring. In implementation it is important to know who is responsible for what. Also good planning and tailoring of the chosen measures to fit the company helps to achieve good results. Monitoring is the last step in the diagram, but this has a connection to all the other phases. This makes it an important part of the process (Pollanen et al, 2003).

#### 4.5. Good Practice - Travel Plan Essentials

Travel Plan Coordinator	A person is named, with clarity about how they engage with decision makers in the company.
Travel Plan Document	The Plan is published and made available to the public.
Concrete Measures	Evidence is given that the measures involve tangible outputs, e.g. cycle storage, showers.
Smart Targets	The travel plan contains targets that are specific, measurable, attainable, realistic and time-bound.
Committed resources	Specific allocation of resources, financial and non-financial, has been committed for the implementation of the travel plan.
Baseline Data	A staff travel survey and a site audit have been undertaken
Monitoring Mechanism	Evidence is given of a systematic approach to measuring the performance and thus the impact of the travel plan.

#### 4.6. Working In Partnership

Organisations can also benefit from linking into other actors around them. Local authorities can to a great deal make travel plans more effective through offering advice and funding infrastructure improvements. They can also co-ordinate travel plan networks for local employers. Setting up Travel Plan Networks with other employers can also be helpful. They offer a chance to share ideas and co-operate in local initiatives. Particularly for smaller organisations linking with other employees can give more weight in negotiations with, for example, public transport operators (DfT 2002).

## 5. Making Modes Safer for Commuting

Having undertaken a travel plan to cover commuting, employers will have identified appropriate modes and associated risks for the journey to and fro from work for each employee. This section presents the different modes used for commuting including the car, public transport, Powered Two Wheelers (PTW), cycling and walking and looks at what employers can do to make their use safer. It should be borne in mind that safety is a very important criterion, however many criteria influence the decision of commuters and it is vital to cater for the needs of every mode.

### 5.1. Company Cars

#### 5.1.1. Future Visions for Business mobility and Company Car Fleets

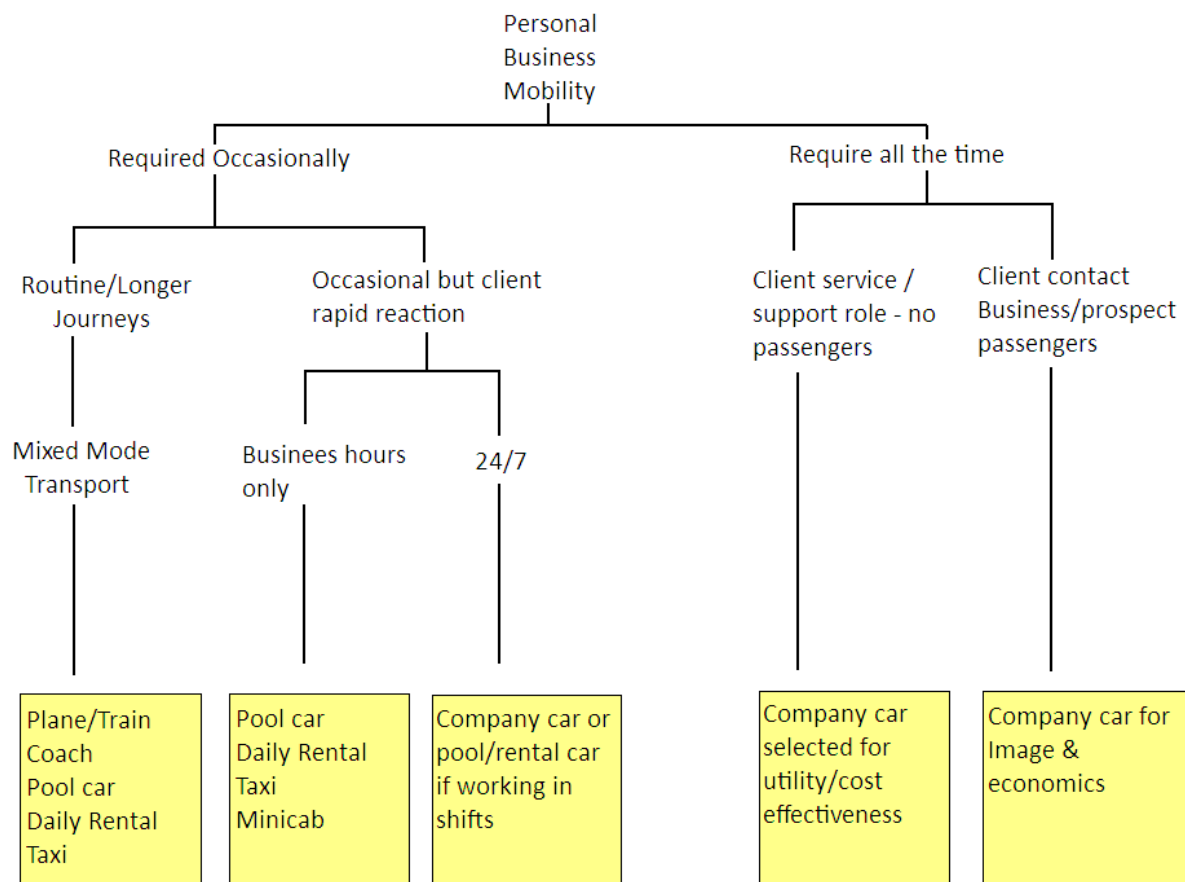
Car drivers mainly cause the road traffic death of other car occupants, motorised two-wheelers, cyclists and pedestrians. Trips by public transport including before and after walking or cycling are collectively safer than car trips (ETSC 2003). Yet, in the short term, business car provision is sure to continue to be a key factor in employees' modal choice. Company car registrations account for 50.5% of the 11.6 million passenger cars registered across 18 EU Member States in 2008 (Polk 2009)<sup>1</sup>. If an employee has a company car and a petrol allowance then the natural choice, notwithstanding all the possible disadvantages of driving to work, may still be to simply drive to and from work. Distance rates, vehicle allocation rules and incentive schemes should aim to minimise vehicle use and any schemes that may encourage artificially high vehicle use should be revised in order to reduce unnecessary on-road exposure (Murray 2010). These factors will also have an impact on commuting. Cooke (2010) stresses the need to review what the employer criteria for allocating company cars are.

As regards fuel costs, only a few Member States ask employees to account for the fuel received from employers for private use. In Belgium and the Netherlands pure business use represents only 20-30% of company car use, the rest being pure private use and home-work commutes. When looking at fiscal treatment of company cars as benefit in kind, employees in many MSs receive benefits that are undertaxed relative to alternative salary remuneration. A recent study carried out for the European Commission estimated that tax revenue losses may approach 0.5% of EU GDP (54 bln EUR) (Polk 2009).

<sup>1</sup> However, the share of company cars in total registrations varies between countries. It is lowest in Greece (24%), highest in Germany (60%)

Company cars can absorb a lot of capital and, in the current business climate, economics will also play a big role in deciding the size and type of a company fleet. “The company car will have to earn its keep economically in the future more than it had to in the past” (Cooke 2009). Other important drivers for choice of mode are government tax regimes, both those regulating company cars and personal cars. Risk management, which has already started to rise as an important issue, will continue and be linked to strategies to cut overall business mileage. In the short to medium term there will be a move towards ‘City Cars’ in

some urban situations to minimise and avoid congestion charges. Company, or departmental pool cars, locally hired against a contract may be used to replace “grey fleet” use (see below) and, over time, other company cars. Total business mileage is already under scrutiny and will be cut further by reduced face-face contact replaced by electronic communications (Cooke 2009). In light of this, a current fleet car provider’s role may change to taking on a different role with clients and becoming more of a provider of the total personal business mobility mix. Having gone through the travel planning process and, if



Business Mobility Decision Tree (Cooke 2002).

the conclusion is that company cars are still the best option, then clear steps should be taken to ensure that the vehicle and the driver are as safe as possible. A comprehensive risk management programme should be in place that also covers those who do use company cars to drive to work. Employers should specify minimum standards of vehicle safety features and EuroNCAP star rating.

5.1.2. Grey Fleet

“Grey fleet” vehicles are employees’ own, ‘private’, vehicles when used for work. They may also be used for commuting. There are additional concerns that need to be considered here. A gap analysis risk assessment should be undertaken to ensure that if drivers use their own

vehicles to commute then they are also included in the employers’ work related road safety policy. The vehicle itself should be ‘fit for the task’: this means also that it should be fully insured, serviced and maintained to a high standard. Employers could also specify minimum standards of vehicle safety features, such as maximum age, if they are being driven also for commuting purposes. As far as risk assessing the driver, this was included in the PRAISE Report on Driver Training (ETSC 2010). Training, following a driver risk assessment, should be offered to all who need to drive for work, regardless of if they are using their own cars or vehicles of the company. Employers

could consider extending the driver risk assessment and relevant training also to employees who use their own vehicles to drive to work.

#### National level Recommendations

- Consider tax regime changes to the vehicle and mileage undertaken to incentivise reducing vehicle use and on-road risk.

#### Employer level Recommendations

- Distance rates and incentive schemes should aim to minimise vehicle use and any schemes that may encourage artificially high vehicle use should be revised in order to reduce unnecessary on-road exposure.
- Undertake a risk assessment which covers route for travel to work and mode of transport.
- Run campaigns to raise awareness about regularly maintaining company and grey fleet vehicles.
- Offer driver risk assessment followed up by relevant training to improve driving skills and integrate eco driving training that also tackles correct driving speeds.
- Ensure that grey fleet vehicles used to commute to work are fit for purpose and well maintained and insured.

### 5.1.3. Car Pooling

Car pooling is a way of reducing the number of cars in cities without restricting individual mobility. Road users who commute along the same routes get together to travel together. They use their private car but share the seats available in their car with other commuters, typically colleagues, and they tend to share the petrol price. This can be as simple and informal as “giving your colleague a lift” or facilitated through the setting up of an information network to find out which people commute along the same route and get them to car pool. For all but very small companies, an online car sharing database will prove useful. This allows people to enter their journeys so that the database can automatically search for colleagues whose journeys match. While some schemes enable staff to find a car partner through the organisation’s intranet, others rely on a coordinator who administers the service. A number of software packages exist to help companies set up their car pooling scheme (DfT, 2002).

Integrated into a car sharing system should also be a way of checking the level of maintenance and safety of the car pool fleet, be it ‘grey fleet’ or belonging to the company itself. Moreover, personal safety implications of sharing lifts home should also be considered. Developed as an environmental measure, car pooling also offers a number of benefits to road users including cheaper commuting costs, reduced congestion, and a reduction of exposure to risk.

#### National/local level Recommendations

- Promote car sharing by providing less congested lanes to car-poolers (e.g. Madrid).

#### Employer level Recommendations

- Set up an information network to help employees get involved in car pooling. This can be done notably via the company/organisation’s intranet and through the purchase of software packages.
- Provide priority parking or exemptions from parking charge for car pooling employees.
- Set up a guaranteed taxi ride home in case of need to overcome concerns that a car sharer might be stuck at work.

### 5.2. Powered Two Wheelers

Motorcyclists face a much higher risk of being killed than other road users. For the same distance travelled, the risk for riders to be killed in road accidents is much higher on average than the risk of being killed in traffic for car drivers. In 2006 at least 6,200 Powered Two Wheeler (PTW) riders were killed in road crashes in the EU25 representing 16% of the total number of road deaths while accounting for only 2% of the total kilometers driven (ETSC 2008). There also is a trend of modal shift to PTWs to commute to work to avoid issues such as congestion, congestion charging and parking. In Europe the PTWs circulating parc has increased by 69% between 1994 and 2004<sup>1</sup>. Between the years of 2003-2008 the circulating parc of passenger cars increased by 7.4% (ANFAC, 2008) while in the same period the circulating parc of PTWS increased by 10.2% (ACEM).

While riding a motorcycle will inevitably carry more risk than driving a car, evidence shows that the implementation of dedicated safety measures can substantially improve PTW safety. The measures should aim at improving the behaviour of motorcyclists, but also the behaviour of other road users and providing a safer environment for PTW riders as well as tackling PTW vehicle safety. The rider’s skills, training, experience and attitudes are fundamental to safe motorcycling. Riders should receive appropriate training when they start to use a motorcycle (or re-start after a period of not motorcycling) and receive further training as they progress from smaller to larger motorcycles. Motorcyclists should be made aware of the difficulties other road users have in detecting PTWs and evaluating their speed (ETSC PIN 2008). The PRAISE Thematic Report 2 on Driver Training detailed best practice on post licence training for PTWs in the driving ‘for work’ and ‘to work’ context. As for company and grey fleet used for commuting to work, employers should include use of PTWs under their risk assessment and

<sup>1</sup> 6 ACEM <http://www.acem.eu/cms/ptwfatalities.php>

cover both the rider and the vehicle itself.

#### National level Recommendations

- Enforce the compulsory wearing of helmets.
- Install speed cameras able to detect speeding riders and enforce motorcyclists' compliance with speed limits.
- Improve rider and driver training. Rider training should focus on hazard recognition and risk assessment as well as vehicle control skills. Driver training should ensure that candidates understand the vulnerability of motorcyclists and "look out for them" when driving.
- Educate riders regarding the importance of proper fastening and provide consumer information regarding helmet safety.
- Minimum standards regarding protective clothing should be developed.
- Road design and maintenance should address the specific needs of PTW users (provide good winter maintenance, use of anti-skid surfaces, forgiving roadsides).

#### Employer level Recommendations

- Undertake a risk assessment which covers route for travel to work followed up by relevant training to improve skills.
- Consider what facilities are provided for PTW parking and if they are secure, well lit and maintained.
- Provide facilities for PTW riders such as lockers.
- Include safety criteria when purchasing PTWs.
- Run campaigns to raise awareness about regularly maintaining PTWs.
- Ensure that company and grey fleet PTWs used to commute to work are fit for purpose and well maintained and insured.

### 5.3. Offering Targeted Public Transport

The core public transport modes (bus and rail) are the safest modes of transport. Employers can play a key role in offering targeted public transport as an option to commute to work. There are also benefits from other perspectives with public transport as there is less need for cars which results in less congestion and parking problems. At present most of the commuting trips are undertaken in cars. The public transport system has its best level of service at typical rush hour time (starting and ending time of working hours). Access to information such as timetables and real time information concerning disruptions is also vital to ensure users are not discouraged from using public transports (see the "Smart Bus Stop" case study below). Modern information systems such as websites, SMS-services and real time information at stops and in vehicles support a positive image of public transport and are appreciated by the users (GUARD 2010). Key to

ensuring that public transport services are a viable option for commuting is ensuring that targeted and reliable public transports are available on commuting routes. As well as reaching safety targets for their employees, employers can also reach the goals for environmental and quality management. All three are important for company image and job retention and satisfaction. Employers would also benefit by needing fewer spaces for parking which would reduce related costs.

When public transport is available for commuting, one barrier can also be the cost (commuting by train for example can be expensive). In this case, discounted ticket deals for companies that encourage their employees to use public transport in their travel plan can be sought. This is likely to please staff, having season tickets also bring in the advantage for them of being able to travel during weekends or evening trips at no extra costs (DfT 2008).

In Germany, so called "Job tickets" are offered to employees, as does for example the German Road Safety Council. These are monthly or annual season tickets, purchased en block from a regional transport association by public or private organisations for use by their staff. Job tickets usually require the purchasing organisation to buy a large number of tickets (typically 20 or more), and for at least 50% of their workforce. In return job tickets offer a large discount on the price of individual season tickets. Many organisations further reduce the cost of the season tickets to their staff by charging a reduced price, or passing the tickets on free of charge - effectively subsidising their employees' travel to work. Purchasing organisations are also responsible for ticketing administration, such as issuing of the photocards and the actual tickets. Nevertheless, SMEs sometimes are not able to fulfill the minimum amount of tickets required by the regional transport associations to be purchased, yet they can build partnerships with their corresponding interest associations.

Interchanges and interoperability with other modes should also be taken into account. A transport network that encourages the non-motorised mode options such as walking and cycling (see section below) is also particularly important in terms of enabling access to urban public transport and interchanges (EEA 2008).

#### 5.3.1. Shuttle Services

When there is no or insufficient public transport available, employers might consider providing their own alternative by setting up shuttle services, for example between train stations and the place of work. Shared shuttle buses are safer than individual car use as explained in the public transport section above. In Italy,<sup>1</sup>

<sup>1</sup> Source: Roma Servizi per la Mobilità

public administrations (Municipalities/the Ministry of Environment) have set up a scheme to allocate funds and provide support to companies cofunding services of company shuttles. Companies with a Mobility Manager (see section below on national initiatives, the experience of Rome) can submit applications for the co-funding of shuttles: this includes the reimbursement of up to 50% of the total costs of management for a period of two/three years. There is also the possibility for a group of employers located in the same area to submit a project to obtain co-funding for a shared service.



Company Shuttle (Roma Servizi per la Mobilità)

### 5.3.2. The “Smart Bus Stop” case study: Rome

The so-called “Smart Bus Stop”<sup>1</sup> tells the waiting time for the bus: citizens can thus decide whether to wait or do something else during the minutes available.

This service, which is active on about 200 bus stops in the city of Rome, also has had a widespread diffusion via its application for mobile phones. The service is free (only the operator’s cost for connection is applied).



Companies can request to include in their own intranet a specific link to the neighbouring bus lines/ bus stops. Employees can therefore know in real time when “their” bus is getting to “their” bus stop without waiting for it outside. Many companies and institutions opened to the public linked this service to screens to be consulted by customers/clients.

Source: Roma Servizi per la Mobilità

National/local level Recommendations

- Promote the extension, quality, marketing and use of public transport.
- Annually asses the level of service and use of public transport.

<sup>8</sup> Source: Roma Servizi per la Mobilità

- Assess routes (direct routes without changes), suitability of timetables (related to the starting and ending time of working hours), journey times to take commuting with public transport into account.
- Ensure good access to information about public transport (timetable and real time information)
- Encourage the centralisation of work activities so that they can be served better by public transport
- Improve infrastructure: raised kerbs; priority measures such as bus lanes; better quality bus stops and waiting areas in the places where staff travel.
- Promote employer-subsidised public transport tickets (for example annual season tickets).

Employer level Recommendations

- Offer employees subsidised annual season public transport tickets.
- For larger employers, provide on-site travel centres offering comprehensive information.
- Put travel information, such as timetables, on company intranet sites.
- Seek dialogue with public transport operators in order to ensure they provide schedules and routes that are fit for the staff.
- Offer shuttles services to work when there is poor or no public transport alternative available (for example shuttle from train station to place of work).

### 5.4. Walking and Cycling

Efforts should be made to make walking and cycling a safe travel mode for citizens for commuting to and from work. In 2008 6.7% of all road deaths were cyclists and 20.4% of all road deaths were pedestrians<sup>2</sup>. It is often claimed that cycling or walking should not be encouraged as they are less safe transport modes than cars. But research emphasises that the advantages of more walking and cycling for public health and environment (reduced mortality and healthy lifestyles through regular exercise) outweigh their disadvantages (the risk of death or injury) (Sælensminde 2004). For the individuals who shift from car to bicycle, it is estimated that beneficial effects of increased physical activity are substantially larger (3-14 months gained) than the potential mortality effect of increased inhaled air pollution doses (0.8-40 days lost) and the increase in traffic accidents (5-9 days lost) (Hartog 2010). Many also choose to cycle or walk out of financial reasons. It has also been shown that, when cycling levels reach a certain critical mass, accidents become fewer and fewer. This is evidenced in cities with a high modal share such as Amsterdam and Copenhagen which have seen a decrease in accidents in conjunction with a rise in cycle numbers.

<sup>9</sup> [http://www.ec.europa.eu/transport/road\\_safety/pdf/statistics/2008\\_transport\\_mode.pdf](http://www.ec.europa.eu/transport/road_safety/pdf/statistics/2008_transport_mode.pdf).



Fear of traffic is an often cited reason for not walking or cycling. Especially in the Nordic countries slipperiness is a major concern during the wintertime; winter maintenance and anti-skid shoes as well as studded tyres for bicycles are some of the solutions for this particular problem. Reluctance to take up these health promoting and sustainable forms of transport is one element of the obesogenic environment (PACTS, 2007). Encouraging cycling and walking to work can also be part of workplace health promotion. Health aspects were also covered by ETSC's third PRAISE Report on Fitness to Drive (ETSC 2010). For example one study shows that employees cycling to work are more productive:

- Cycling reduces stress and depressions
- Cycling reduces sleeping problems and tiredness while increasing stress tolerance and confidence (feeling of freedom and independence);
- Time reliability: cyclists know at what time they arrive at work or for an external meeting

#### 5.4.1. Cycling

Employers can take a number of measures aimed at increasing safety of their employees who choose to cycle to work. One is within the first needs assessment to look at routes to work and work together with the employees to choose the safest routes. A map with these routes can then be published by the employer and included on their website. Internet tools can also be used to help cyclists make best use of the cycle network (GUARD 2010). Employers can also hold Bike To Work days with promotions such as cyclists' breakfasts, bike clinics, and police bike tagging. According to the UK study 'Making Travel Plans Work', which draws on different case studies, such actions can raise cycling levels by five or even ten times. Their popularity suggests good potential for increasing regular cycling if barriers such as local road danger can be effectively tackled (DfT 2002).

Organisations can also try to negotiate with local cycle shops to provide staff discounts on cycling equipment, repairs and servicing including safety equipment such as functioning lights. Employers can also consider incentives such as cash payments for each day cycled, or accumulation of daily tokens which can be used in local cycling shops. Another option could be building up a company bike fleet. The use of such a fleet could be promoted through salary bonuses. A bonus could be given to employees who do not spend their entire allotted amount for fuel on the company car because they cycled to work.

Efforts should be made by local administrations and governments to create a safer environment for walking and cycling. The provision of additional cycle lanes and facilities (often in conjunction with other measures) is generally associated with increased cycle flows and increased percentage of trips made by cycle (GUARD 2010). Experience from some cities also under the same project showed that strong and very visible promotion of cycling, in conjunction with significant improvements to infrastructure, changes the minds of planners, politicians and travel habits of citizens (GUARD 2010). Employers can play a key role in channeling feedback from their employee travel survey on bike routes and safety concerns back to the actors responsible for infrastructure. Some local authorities may have specific cycling officers to respond to such requests.

Training needs to be approached sensitively because learning to cycle is associated with childhood and adults can be reluctant to admit that they are not confident. New cyclists would benefit from a buddy whereby a more experienced rider accompanies them and shows them the best low traffic routes and also how to cycle on routes where no specific facilities are provided. New software also exists to match people for bike journeys in the same way as car pooling databases match up car journeys (DfT 2008). Cycling in groups has the advantage to be better visible to other road users, and therefore decreases number of accidents. Electric bikes are also increasing: training is recommended to adapt cyclists to the different requirements of electric bikes.

#### 5.4.1.2 Example of an Employer that took Measures to Improve Cycling for Commuters

The Society for Technical Cooperation (GTZ) in Eschborn, Germany (about 1,000 employees) is participating in the project "bike + business" which aims to increase the share of cycling in the modal split of commuter traffic<sup>1</sup>. In addition to measures at company level, the concerns of the GTZ were also drawn into the development of local train stations, and developing the inner city cycling concept for the town. Activities included conducting a staff meeting to "bike + business" and improving bicycle parking facilities (quality, location, lighting, access roads, showers, lockers). Cycle websites were created on the corporate intranet. Another key outcome was the creation of a cycle map for commuting which was developed in close cooperation between the metropolitan planning organisation Frankfurt Rhein-Main, the ADFC Hessen, the city of Eschborn and GTZ. The map was designed to display the cycling network routes of the city from all directions in Eschborn and was based on the experience of cyclists of the GTZ commuting to work.

10 <http://www.bikeandbusiness.de/pilotprojekt.htm>.

### 5.4.1.3. Commuting by Bicycle in Copenhagen

Copenhagen, with a population of 500,000, is an example of a city where 37% of workers reach work or educational establishments by bike and 60% of citizens use their bikes everyday and for all of their trips. It was also calculated that, if cycling increased by a further 10%, 8 million EUR would be saved annually in health costs. Efforts by Copenhagen authorities have led to a 50% reduction of killed and seriously injured cyclists from 2000. To continue having these high levels of cycling and improving safety records, a number of policy interventions have been applied that also improve safety of commuting cyclists. These include for example restrictions for HGVs over 18 tones and recommended routes for HGVs through the city. To further minimise HGV and cyclists collisions LED technology informs HGV drivers if a cyclist is approaching at junctions. So-called “Green Cycle routes” have been developed for cyclists identifying safe routes. Green waves for cyclists, where traffic lights are set at the speed of cyclists, were created. A so-called “cycle bus” system whereby cyclists meet at set places and times on a route map to commute in and out of town together have also been set up. These improve safety and increase the feeling of security of the cyclists themselves (Rasmussen 2010).

### 5.4.1.4. Using the Paris Public Bike System Vélib to commute

The Vélib public bike system was launched in Paris in 2007 as part of the City of Paris’s aims to decrease individual car traffic and promote alternative means of transport including public transport, walking and cycling. Paris now has 20,600 bikes deployed at 1,451 stations with a station every 300 meters. In Paris 61% of long term subscribers use Vélib to go to work or school, 40% as the main mobility means for these trips. Around 61% of people think that Vélib is a service which is easy to use, practical, fast and available. Also 84% of citizens think that Vélib completes the offer of transport. Average duration of a trip is 18 minutes. Road Safety doesn’t curb the use of Vélib, only 10% of users name it as a downside. The bikes themselves are fitted with safety features including lights that come on as soon as the bike is used and reflector strips on the wheels. In response to the road safety aspects of the increase in cycling, the Paris City Hall prepared a communication campaign including flyers distributed to all new subscribers of the service describing the safety rules with good advice for cycling in Paris. This was linked by the Police carrying out enforcement of these rules. The results for road safety show that the rate of accidents have not increased but that the overall rate of fatal accidents, particularly involving HGVs, are still too high and need to be tackled. A special campaign around blind spots was developed and run in 2007 targeting both drivers and cyclists.

### 5.4.2 Walking

As with cycling, safety is a key consideration for employers wanting to encourage walking as part of workplace health promotion. Site location is also an important factor, walking can be a mode of a choice especially when employers are based in towns or close to residential areas. As with cycling, employers can work with local authorities managing infrastructure to improve pedestrian safety. Issues such as route choice and creating a pedestrian friendly map are key. As with cycling, maps showing pedestrian friendly routes can be drawn up and publicised on the employer’s website.

#### National/local level Recommendations

- Improve the safety of unprotected road users within the context of workplace health promotion.
- Promote walking and cycling for commuting but with the emphasis on safe use of the roads.
- Set up cycle buddy and cycle bus schemes to encourage cycling safely.
- Improve infrastructure and especially make roundabouts safer for unprotected road users by reducing the width of the circulatory carriageway, increasing deflection on entry and improving signing, road markings and conspicuity.
- Tackle speeding and set 30km/h as the standard speed limit in urban built-up areas.
- In areas where speed limits are over 30km/h, provide dedicated infrastructure for cyclists.
- Provide shorter and safer routes for pedestrians and cyclists by ensuring that routes are direct and that the quickest routes are also the safest.
- Provide benefits such as fiscal stimuli to promote cycling and walking to work and reduced VAT for cycle repairs.

#### Employer Recommendations

- Improve quality of off-site cycle and pedestrian access by working in partnership with other employers in the area and local authorities and cycling groups.
- Provide training for those who are not confident cyclists and introduce a cycle buddy scheme.
- Encourage use of safety equipment.
- Create site specific cycle/walking maps identifying safe routes
- Guarantee free use of company bike for commuting with the chance to try different models such as folding and electrically assisted bikes.
- Provide financial or in kind incentives for those agreeing to cycle or walk to work.
- Organise events to encourage cycling and walking also focusing on safety issues such as

- cycle maintenance and visibility.
- Provide showers, changing and locker facilities for cyclists and walkers: these can also be used by joggers during lunch breaks.
- Provide cycle shelters for parking that are secure and are situated close to building entrances. Access to parking needs careful consideration to avoid conflict with other site traffic.
- Engage with local authorities to improve infrastructure safety for pedestrians and cyclists.

## 6. Factors Influencing Commuting

This section will present three other factors influencing commuting times and routes: working patterns, land use and route planning.

### 6.1. Flexible Time and Shift Work

Flexitime gives the possibility to work more freely and plan the journey accordingly. This means that employees can choose to travel at times that link in with better transport choices. For example, they can drive by car but avoid the rush hour. Or they can car pool and share with other family members. Flexitime has also other advantages, as it can improve the job satisfaction and motivation. Flexitime can also be used to work longer days and create compressed weeks and then employees can take days off which in turn also reduce the days that they commute into work. This makes particular sense for those travelling longer journeys to reach work and for those balancing childcare, for example. However, flexitime is not possible for all types of work such as, for example, in the service sector.

Some employers and employees could also consider telecommuting or home working, for example one or two days a week - and thus reduce the need for commuting into work every day. However, there is also the possibility that home working will encourage people to live further from work so that they may reduce trips but increase miles. Organisations using home working need to cut travel, monitor the effect on car commuting distance and check they are not exchanging fewer trips for more miles<sup>1</sup>.

Commuting for shift workers can pose other problems linked to time and circumstances of travel. Their journeys to and from work may be affected by fatigue. Employers of shift workers should therefore particularly be aware of the risks of fatigue when commuting. Employers should make it possible for workers to rest (even at the workplace) before going into traffic. They should pay attention to individual needs and making alterations if possible considering the individual situation. Moreover, if employees choose public

<sup>11</sup> Making travel plans work: lessons from UK case studies, Department for Transport, 2002.

transport, attention should be paid to security concerns of travelling late at night or early in the morning. This issue has been dealt with in more detail in our third PRAISE report on Fitness to Drive (ETSC 2010).

#### National/local level Recommendations

- Adopt employment policies that enable teleworking and flexi-time and can result in differentiated commuting patterns and a better work/life balance.
- Invest in public transport also at off peak times.

#### Employer level Recommendations

- Introduce flexitime arrangements if the business model allows to enable employees more choice in mode of transport and to avoid peak travel times.
- Offer home working if business mode allows but monitor length of journey.
- Provide particular support in offering modal choice for shift workers taking safety and also security issues into account.
- Make sure that shift workers work same shifts as much as possible to engender more regular sleep patterns.
- Give particular consideration to night shift workers especially regarding journeys home after work, for example by providing sleeping facilities on site.
- If cost effective provide taxi rides to workers who occasionally work extra hours / overtime and have to return home late.

### 6.2 Safer Routes

Commuters do not necessarily choose the safest routes to commute. This can be addressed either by reducing the road risk along commuting routes (especially via infrastructure measures) or by providing information to help commuters choose safer routes whichever mode they are using. Commuters typically prefer the quickest route to work (not necessarily the safest), it is therefore necessary to ensure that the road risk on their commuting routes is minimised. There are still many infrastructure deficiencies that can lead to accidents while commuting to work.

Traffic management through ITS can also be of use, for example with the use of tools such as dynamic speed limits that change during peak hours. Helping commuters choose the safest routes to work should also be considered. Road users are not typically aware of the safer alternative offered to them. Safe routes to school programs for children are quite popular and such initiatives should be extended to commuting more generally. Key to this is the involvement of employers. A number of I.T. tools can be used for that, integrating information such as the location of high risk sites and real time information

to avoid congestion or to inform road users of locations where an accident has just occurred.

#### National/local level Recommendations

- In designing new infrastructure, responsible authorities should make sure that new roads are built without dangerous street furniture and, when this is not possible, street furniture should be designed to be more forgiving.
- Mandatory road safety audits should remove roadside hazards within the design stages of a scheme.
- Responsible authorities should identify a road hierarchy according to the functions of different roads.
- Authorities should create attractive and convenient routes for the journeys on foot or by bicycle that people would actually like to make – routes with less proximity to motor traffic and safer provision for crossing roads.
- Reduce speed limits where motor vehicles still travel in proximity of people walking and cycling.

#### Employer level Recommendations

- Promote initiatives to help commuters in their route planning / information about safer routes such as EuroRAP (EuroRAP is a programme that aims to provide independent, consistent safety ratings of roads).
- Support employees in route planning to prioritise safe routes to and from work.
- Display real time information about congestion and accidents that is posted on the intranet or screens at the place of work.

### 6.3. Land Use

Integrated land use and transport planning should be made a key tool in managing the demand for travel and transport and in influencing road safety and mobility patterns across the EU. Urban design affects travel patterns. Today the aim is often to reduce the movement of non-essential traffic through new housing areas, towns and cities, whilst increasing accessibility to and viability of public transport services. To deliver integrated land use and transport planning there is a need at the national level for greater collaboration between the Transport Ministry and other ministries that influence transport, such as Finance, Planning, Environment and Industry. Without high-level coordination, the delivery of integrated transport and land use planning will rest in the hands of pioneering authorities rather than being a common deliverable across Europe (EEA 2008).

An example of good practice can be the setting up of collaborations between public authorities and local

employers (local employer associations/chambers of commerce/industrial zones/Business parks etc.) who know best what the needs of their employees are in their local surroundings and can therefore have a positive influence on the land use planning process. Local employers can also agree among themselves to group common areas together, such as sharing car parks, to reduce unnecessary trips.

#### National/local level Recommendations

- Authorities should encourage the integration of road safety into land use and transport planning.
- Work activities should be centralized so that they can be served better by public transport.

#### Employer level Recommendations

- From the onset when employers consider site locations commuting and ease of access should be considered.
- Employers should be encouraged to get together to inform public institutions of their local needs, or even ask for public funds to coordinate projects.

## 7. National Level Actions

A number of positive actions can be taken at national level by relevant authorities. A first step should be the good collection of commuting data, lacking in many countries. Depending on the legal compensation system in place, the definition of what constitutes a commuting accident will differ from one country to another (see commuting overview above), and therefore influence the collection and availability of data. Measuring the extent of the problem (as we have seen commuting accidents are a very significant proportion of occupational accidents) and monitoring the patterns/trend is vital to facilitate actions at the national level. Such actions can include the adoption of guidelines and incentives for employers, or the funding of mobility projects as detailed in the examples below.

### 7.1. France

A lot of work is conducted in France on this topic. In 2008, out of 956 fatal occupational accidents that occurred, 333 were commuting accidents (CNAMTS, 2010). The situation is well known in great part due to the fact that in France commuting accidents are insured by the public occupational injury scheme, and a small part of the compensation paid in case of commuting accidents is also borne by the employers as these accidents are considered when the insurance premiums are calculated. For this reason the decision was taken to draft a working text on the prevention of commuting risk (“risque trajet” in French), this text was adopted in 2004 and serves as guidelines to employers. This follows from an earlier text adopted

in 2003 on the risk while driving during work hours (“risque mission”) that had as a reference the European Directive 89/391 on health and safety in the workplace.

The text on the prevention of commuting accidents (CNAMTS, 2004) states that such accidents represent an enormous social and economic burden, about 45% of occupational deaths, and that a number of measures taken by employers and local actors can significantly reduce commuting risk.

As a priority, measures should be taken to avoid or reduce the exposure to risk:

- Reducing unnecessary journeys, including providing a canteen for lunch breaks and, for certain occupations setting shifts that do not provide long breaks that might encourage employees to return home in the middle of the day.
- Prefer public transport modes by providing incentives to employees, or providing shuttles financed by the employer if needed.

When this is not possible:

- Improve the local access to the place of work and provide better parking facilities for employees.
- Encourage employees to ensure their vehicles are well maintained and meet technical standards.
- Help employees to maximise their safety when they are about to use the roads, through adapting working hours accordingly, providing information about the traffic conditions to help employees prepare their trip (weather condition, road works, etc.), providing maps on the best way to reach the place of work.
- Inform and raise awareness of employees about the risks while commuting (via campaigns/info days/training programmes).

The text also encourages local employers to get together, as these measures can be more efficient when they are taken together by a number of employers, and especially to collaborate with the local authorities.

Importantly, this text is the building block for ongoing work by the Steering Committee for the Prevention of Work Related Road Risk (an organisation made up of all the French public health insurance entities). A round table on the prevention of commuting risk was held in Paris, and a White Paper on commuting risk is due to be published in February 2011 (CNAMTS, 2010). In particular the topics that are being discussed by the steering group and that will be published in this White Paper include the setting up of local networks and actions, the merging of safety and environmental goals of improved commuting, and a focus on the risks

caused by modal shifts to new modes: car pooling, cycling, powered two wheelers.

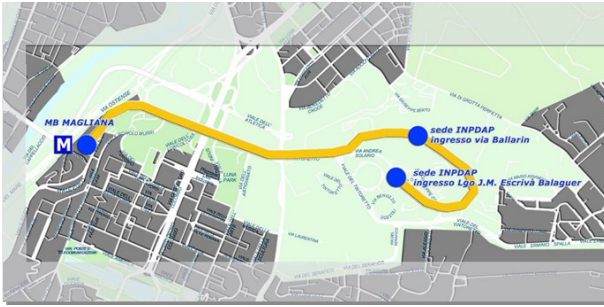
Finally, an online tool was created to help employers evaluate their organisations’ work related road risk. This tool is called PEDRO<sup>1</sup> and two different PEDRO modules were created (one for road risk during working hours and one for commuting risk). The “PEDRO Trajet” evaluation, on commuting, is divided in three sections that contain information to help employers assess their employees’ commuting patterns and accidents, their road safety management, and the actions they have in place. Essentially this is a questionnaire asking questions such as “Do you have this in place?” or “Did you do this?” for a number of items in each of the three sections, and providing information along while the employer undertakes the questionnaire. The “PEDRO Trajet” tool can be accessed online.

## 7.2. Italy

In March 1998 a Decree introduced the new figure of the Mobility Manager. Private Companies as well as public institutions with more than 300 employees in a single premise or with over 800 employees in more than one premise can nominate a Mobility Manager, responsible for the personnel mobility. Mobility Managers play the role of interface between the Institutions and Decision Makers in the field of urban mobility and the requirements of the company they represent. A number of incentives, such as reduced annual public transport tickets or the possibility to apply for the co-funding of mobility projects, induce companies to nominate a mobility manager. The Mobility Manager’s main goals are:

- The reduction of the use of private car for commuting in favour of public transport and /or optimisation of modal shifts
- Promotion of communication and awareness of issues regarding mobility
- Fostering the gradual introduction of low environmental impact vehicles

<sup>12</sup> Evaluation and action plan for professional road risk <http://pedro.artifrance.fr/trajet/>.



Project of shuttle cofunded by the Municipality of Rome (Source: Roma Servizi per la Mobilità)

The establishment of a home to office Commuting Plan is also one of the Mobility Managers' main tasks. The mobility of employees is first surveyed through questionnaires asking information about both their present commuting mode of transport used, and their availability to adopt more intelligent commuting habits if a number of measures/tools/incentives are made available. A commuting plan is then drafted, including notably the company's best practices and fostering the use of public transport or its integration with the private car. Appointed Mobility Managers often lack some of the specific technical skills needed for their role, and are therefore guided by a public figure appointed in their region: the Area Mobility Manager. Area Mobility Managers assist all the Mobility Managers and Companies with advisory activities and technical support. The Interaction between Area Mobility Managers and Mobility Managers include:

- Fostering active participation
- Training activities including kick-off initial meeting, events, workshops
- Fostering and creating networks of Mobility Managers, considering that Firms/Companies operating in the same urban areas share similar problems (difficulty of parking, some inadequacy of public transport, etc.)
- Updating Mobility Managers on their activities
- Finding specific solutions for specific cases
- Finding special formulas to foster commuting and integrate companies fleets with car sharing vehicles
- Technical assistance (engineering, planning and design)
- IT support
- Data analyses
- Validation of commuting plans
- Monitoring active projects

Area Mobility Managers are a link between companies and municipalities and public administrations and therefore also provide technical/administrative assistance to municipalities through the following tasks:

- Setting up of administrative acts
- Sharing decision making aspects

- Facilitating contact and meetings with companies on specific topics
- Supporting in the definition/allocation/reform of funds
- Participation in technical commissions

Also, since 2000, a Decree states that all activity poles generating/attracting traffic can be included in the measures/incentives for urban sustainable mobility and can submit projects for co-funding to the relevant public authorities. Potential candidates include: commercial malls, hospitals, universities, auditoriums, etc.<sup>1</sup>

### 7.3. Switzerland

Some public and private companies have introduced a mobility program for all their employees. The focus is on reducing traffic congestion caused by employees commuting, to promote walking and cycling to work and the use of public transport. The mobility structure of the company is analysed, goals are fixed and measures are suggested. Information, awareness raising, organisation, enforcement and promotion measures enhance health and safety of the employees. For instance, companies who join the mobility program receive a financial incentive of 2,000 CHF (1,400 EUR) from the Canton Tessin (in southern Switzerland) and free advice from the municipality. The cantons of Geneva and Vaud have also developed a mobility plan together with very concrete recommendations for employers. In the mobility plan a list of measures is proposed and for every measure a clear distinction is made between how the measure is applicable to commuting (called "trajet pendulaire" in Switzerland) or travelling during working hours. Some of the measures proposed, such as providing company shuttle services, are actually only intended for commuting. The mobility plan can be accessed online: <http://www.unige.ch/ses/geo/oum/doc/Plan%20de%20mobilit%C3%A9.pdf>

### 7.4. United Kingdom

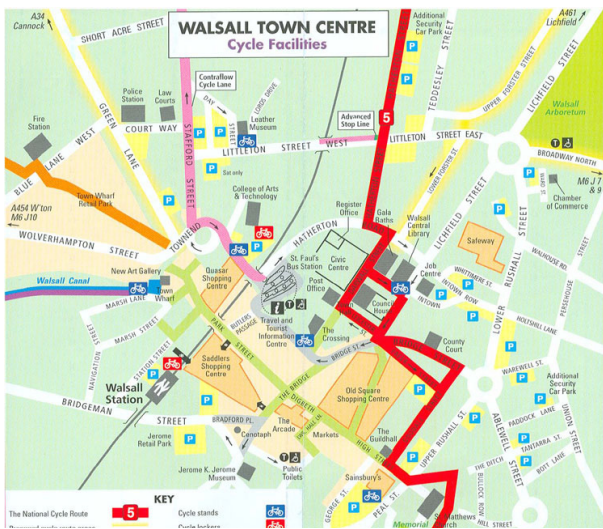
According to the UK Health and Safety Executive commuting is not included in the legal responsibilities of risk assessment. However, actions are being taken to promote the idea of travel planning which also integrates safety issues of different modes for commuting.

At a national level the UK Department for Transport has set up a National Business Travel Network<sup>2</sup> (NBTN) which is hosted by Business in the Community giving access to over 4000 organisations employing one in

<sup>13</sup> All information in this section provided by Roma Servizi per la Mobilità

<sup>14</sup> [Http://www.nbtn.ork.uk/](http://www.nbtn.ork.uk/)

four of the UK workforce. This is a business-to-business network which enables companies to share best practice and promote the rationale for travel plans. Through research and practical case studies, NBTN is developing and demonstrating the strong business case for workplace travel planning. It organises regular meetings to explore relevant issues in travel planning and has developed free information and guidance for employers on topics including tax and travel plans, motorcycling, cycling, walking. They have also developed practical tools to develop personalised access maps for site location and access for pedestrians and cyclists. This is part of the Cycle to Work Guarantee website<sup>1</sup>.



Example of a map for Cyclists to plan a safe route to work (NBTN)

Local Authorities are promoting travel plans which can also include commuting and safety issues. Many local authorities have appointed travel plan coordinators who can provide advice and support to employers who are interested in developing their own travel plans. Some have also prepared packs and guidance which set out the steps taken to develop travel plans with model plans.

Another example of good practice from the UK is to promote healthier journeys to work and to reduce environmental pollution. The 1999 Finance Act introduced an annual tax exemption which allows employers to loan cycles and cyclists' safety equipment to employees as a tax-free benefit. The exemption was one of a series of measures introduced under the Government's Green Transport Plan. Guidelines<sup>2</sup> clarified how organisations can take advantage of the exemption to implement a Cycle to Work scheme that encourages employees to cycle to work and allows employers to reap the benefits of a healthier workforce.

15 [www.nbtn.org.uk](http://www.nbtn.org.uk) or directly through [www.cycleto-workguarantee.org.uk/](http://www.cycleto-workguarantee.org.uk/)

16 [Http://www.dft.gov.uk/pgr/sustainable/cycling/cycle-to-workguidance/](http://www.dft.gov.uk/pgr/sustainable/cycling/cycle-to-workguidance/).

## 7.5. Luxembourg

The Luxemburgish employers' association conducted in 2002 a report on accidents at work showing that, while such accidents were decreasing, the number of commuting collisions on the roads was on the rise, and that as much as 67% of work related collisions leading to deaths were in traffic. An agreement between a number of partners including the employers' association, the insurers' association, the labour inspectorate, trade unions, and the national road safety NGO, was therefore reached to launch a campaign called "Trajet: sécurisons-le!"<sup>3</sup> (this would translate into: "Let's make commuting safer"). The campaign, launched in 2003, aims at providing materials to employers to conduct simple training of their employees. The materials prepared for this campaign were fact sheets on 12 topics (one topic per month of the year) including a reminder of the traffic rules, information about the various risk factors (alcohol, speed, not wearing seat belts, mobile phones) but also explanations about certain important laws of physics (such as braking distances), the impact of weather conditions on safety, or how to prepare for long journeys.

## 7.6. Germany

In Germany the "bike+business"<sup>4</sup> in the area of Frankfurt-Main aims to link the interests of cycling employees with their employers to improve the image of the bike as a modern form of transport. It highlights that the bike can form part of the transport picture alongside public transport particularly as a daily form of transport within local and regional transport planning. It is run by different partners including the ADFC (German Bike Club Hessen) and the Frankfurt/Rhine-Main Conurbation Planning Association. Bike+business wants to contribute to efforts to motivate commuters to choose to cycle to work and increase the modal split of cycling commuters. Commuting cyclists make up 12% of the commuter traffic in towns between 50,000 and 500,000 inhabitants which drops to 6% in cities larger than 500,000 inhabitants (National Cycle Plan 2002).

The project is made up of different modules including infrastructure and communication and access where the project team advises employers on how they can make their business more friendly for those who want to commute there by bike. The second module covers use of the bike and looks at issues such as route planning. The third module consists of a workshop for employees and their employers to discuss different issues around cycling to work. The next stage is the implementation of identified measures. The project also helps to organise information days around mobility and health.

17 [www.trajet.lu](http://www.trajet.lu)

18 [Http://www.bikeandbusiness.de/](http://www.bikeandbusiness.de/).

Finally, an evaluation of the impact is undertaken. The project has also developed a comprehensive handbook which covers all aspects of cycling to work <sup>1</sup>.

Typical prevention activities provided by the Institution for Statutory Accident Insurance 'Berufsgenossenschaften' for their insured companies focus on several areas, also on prevention of commuting accidents. DVR German Road safety Council has been assigned, and is funded by the Statutory Accident Insurance to develop and certify driver/safety officer training and materials such as posters, booklets, brochures, flyers, billboards, videos and computer based training. DVR also provide road safety seminars with the use of mobile and static simulators. Topics include the business case for safety, safe loading, vehicle (car, bus, coach, four wheel drive, van, truck, tanker and blue light) specific issues and fuel efficient driving. The DVR website contains a great deal of material covering road safety at the company level. DVR develops the materials and provides access for the company safety officers (some materials are free, some have to be paid for). The companies paying their insurance premium to the respective Statutory Accident Insurance (according to their risk status) also have an obligation to organize prevention measures in the workplace. DVR supports such company activities. For example, when chemical company BASF organised a road safety week employees participated in simulator training and a seminar. DVR provided the mobile simulator, brochures and a trainer. The Statutory Accident Insurance provided BASF financial support to cover the costs for the simulator and the trainer.

## 7.7. Belgium

Bike To Work is a continuous support programme run in Belgium to get more people to bike to work more often, possibly in combination with another means of transport (e.g. train, bus or car). Bike to Work is part of LifeCycle which is a project supported by the European Union through the European Agency for Health and Consumers (EAHC). Bike To Work also exists for companies. Companies wanting to encourage cycling give bike points to their employees, which entitle them to interesting benefits such as discounts for bikes and equipment. Part of the campaign is also Friday Bikeday where on Friday employees leave their car at home and cycle. Employers are encouraged to provide staff who cycle to work with a free breakfast when they arrive or choose another way of giving them a special treat. Friday Bikeday is an initiative of Brussels-Capital Region, Fietsersbond, Gracq and Pro Velo. At a national level in Belgium employers can pay their employees for every km cycled from home to work and back 20 Euro cents tax-free. After the introduction of this incentive, 50% more commuters cycled to work. Along with a few other EU countries, Belgium applies a

reduced VAT rate (6%) when it comes to repairing bikes in bike shops.

## 8. EU Level Actions

The EU can also take action to improve the safety of commuting in some areas such as road safety data collection, employment law and within the context of its action plan on urban mobility and on ITS with its related Directive 2010/40/EU.

### 8.1. Data Collection and Analysis

The EU could support efforts undertaken to make commuting safer in the EU by improving data collection through its CARE database enabling a clearer picture of the number of commuting accidents. Through this, decision makers could determine how to manage the greatest risks.

### 8.2. Employment Policy

In the field of employment law to protect workers' health and safety, minimum rules on working time are set in all EU Member States under the EU's Working Time Directive (2003/88/EC). Each Member State must ensure that every worker is entitled to a limit to weekly working time, daily rests and breaks and annual leave. However, measures to encourage flexible working hours are left up to the Member States. Yet, in terms of achieving a work/life balance for workers in the EU, the Commission presented in 2008 a framework Communication in order to provide "stronger support for reconciling professional, private and family life" and to achieve the Union's growth and employment objectives. This Communication cites flexible working time as one of the key components in the policy mix.

### 8.3. ITS to support management of commuting risk

The EU ITS action plan and its related Directive 2010/40/EU suggest a set of concrete objectives laying down the framework for the implementation of ITS Under Area 1 of the ITS Action Plan and in the Directive there are provisions for the optimal use of road, traffic and travel data. This includes the definition of procedures for the provision of EU-wide real-time traffic and travel information services and optimisation of collection and provision of road data and traffic circulation plans, traffic regulations and recommended routes. Another short term application identified in the ITS Action Plan is the promotion of the development of national multimodal door to door journey planners, taking due account of public transport alternatives. This could also be very helpful

<sup>19</sup> <https://www.secure.europarl.europa.eu/parliament/public/visit/secured/request.do?language=EN>



to inform commuters about their way to work. Under Area 2, the continuity of traffic management, ITS services are covered to manage rising traffic volumes. Progress in both of these areas can also be useful input to managing road risk for commuters.

#### 8.4. Urban Mobility

In Europe, a very large proportion of fatal road accidents happen in urban areas. Lost time and environmental damage caused by traffic jams cost the European economy nearly 100 billion EUR, or 1% of the Union's GDP, according to the Commission. The action plan on urban mobility proposes twenty measures to help local and regional authorities improve the mobility situation in their area. The Action Plan suggests improving travel information including multi modal travel planners (European Commission 2009). It also lists promoting Intelligent

Transport Systems in the urban environment and enabling the exchange of best practice on pedestrians' and cyclists' safety. Under the chapter on 'optimising urban mobility', the Action Plan stresses that affordable and family-friendly public transport solutions are key to encourage citizens to become less car-dependent, use public transport, walk and cycle more, and explore new forms of mobility, for example in the form of car-sharing, carpooling and bike-sharing. It also adds that alternative means of transport, such as electric bicycles, scooters and motorbikes as well as taxis, can also play a role. Finally, it stresses that company mobility management can influence travel behaviour by drawing the employee's attention towards sustainable transport options. Employers and public administrations can provide support through financial incentives and parking regulations. Implementing these aspects of the plan should be extended also to cover safety aspects. Thus efforts to improve safe and sustainable commuting should also be promoted within the context of the EU's Urban Mobility policy.

##### Recommendations to the EU

- Improve data collection on commuting and collecting "purpose of journey" to inform policy decisions at EU and national level.
- Encourage Member States to promote flexible working hours to stagger commuting times of employees and improve road safety.
- Tailor ITS applications to support traffic management and travel planning for commuting to reduce congestion and improve road safety under the EU's ITS Action Plan and Directive.
- Promote safe and sustainable company mobility management.

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# "PRAISE": Preventing Road Accidents and Injuries for the Safety of Employees

November  
**10**  
Fact Sheet  
**4**

## ETSC interview with Transport for London (TfL)



ETSC's PRAISE project, "Preventing Road Accidents and Injuries for the Safety of Employees" aims at mobilising knowledge needed to create work-related road safety leadership. This Fact Sheet complements the PRAISE Report "Safer Commuting to Work" published in October 2010. Transport for London (TfL) has a scheme aimed at providing a free parking slot at the TfL HQ buildings for its employees who commute with a Powered Two Wheeler provided they meet certain criteria including safety criteria.

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## Transport for London Introduction

Transport for London (TfL) is the local government body responsible for most aspects of the transport system in Greater London in England. Its role is to implement the transport strategy and to manage transport services across London.

### Interview with Steve Connolly, Road Safety Unit, Transport for London

Steve is the co-ordinator of the London team for the European Safer Urban Motorcycling (eSUM) Project.

Working within the London Road Safety Unit of Transport for London, Steve works for the London Motorcycle Policy Unit and the London Safety Camera Partnership, to reduce the number and severity of powered two-wheeler (PTW) casualties in London.

He is the Task Leader for the eSUM Work Package for Rider Training/Driver Awareness Demonstrations, as well as contributing documentation and data for other Work Packages regarding Safety Cameras, Advanced Stop Lines, PTWs in Bus Lanes, Route Analysis, BikeSafe for Employees and Safer PTW Vehicles and Features.

On completion of the eSUM Project at the end of 2010, Steve will be responsible for the TfL Travel Plan, as well as co-ordinating TfL's Travel Plan Demand Management plans for the 2012 Olympics.

## Traffic Safety Management at TfL

1. Do you think that a public organisation has a duty to act as a role model? If yes, can you illustrate how?

By providing clear messages and campaigns on road safety directed at all modes of the travelling public, TfL shows itself to be an employer of choice and recognises its responsibilities not only to its staff, but also to the population of London as a whole.

2. How are transport safety decisions taken concerning employees' safety?

It is widely recognised that a key element of managing Health, Safety and Environment (HSE) effectively is to have a systematic approach to it. This is usually and most effectively done through the implementation of documented HSE Management Systems (HSE MS). A TfL Group HSE MS has been issued. This lays down the over-arching policy, which describes HSE roles and responsibilities at Group level, defines - at a high level



- the common processes across the Group and provides guidance to the businesses on the content of their HSE MSs.

The various Modes within TfL have documented HS&E management systems in place, which are aligned to meet the requirements of the TfL Group HSE MS.

### 3. What safety measures do you have concerning your fleet of vehicles?

Under the HSE MS described above, the Modes within TfL produced their own guidelines and procedures to best suit their individual operational guidelines.

With over 28,000 employees spread across 37 central London head office locations, as well as non-centralised offices, stations and depots for Buses, Tubes, Rail and Trams, it would not be possible to have one standardised document to cover all staff.

The Modes know how their own business operates, so will be in the best position to decide on how individual safety measures are addressed.

### 4. Do you have a Travel Plan for your employees?

A 22 page document showcases travel planning within TfL; it provided details of what has been delivered to date, what the aims of the plan are and how we propose to deliver these aspirations. It also presents employees' existing travel behaviours and opportunities for change, based on surveys across the organisation.

In addition, the plan outlines ambitious objectives for achievement by 2011, the strategy and measures to meet these targets, and the means by which we will monitor and review future progress.

TfL is actively promoting the introduction of travel planning to both public and private sector organisations in London.

We have already produced 'Best Practice for Workplace Travel Planning for New Development' – further details at <http://www.tfl.gov.uk/businessandpartners/15392.aspx>.

This has led to some impressive results, including an average 13 per cent reduction in car use at work sites where travel plans have been implemented and post-implementation monitoring has taken place.

## Commuting at TfL

### 1. Do you have any data tracking road collisions while commuting/travelling for business?

We do hold data on road collisions involving our staff driving official TfL vehicles on work business; this information is analysed to identify any patterns or circumstances which may need to be addressed.

We will only be made aware of road collisions involving staff commuting to work, if they are driving a TfL vehicle or if they are off sick from work, as a result of the collision.

### 2. What overall measures and objectives do you have to improve your employees commuting safety?

TfL currently offers free cycle training to encourage staff to switch to a more active mode of commuting.

In addition, TfL staff can participate in a BikeSafe rider skills assessment day free of charge. BikeSafe is a national programme to reduce motorcycle casualties in which police motorcyclists provide advanced rider training to members of the public.

### 3. Do you know what the modal split for commuting is like?

For our head office-based staff, the modal split for the main mode of commuting (used for the longest part of the journey), was: Train 48%, Tube 40%, Bus 4%, Cycling 3% and Walking 2%.

The modal split varies considerably when considering our operational staff, who undertake shift work at numerous depots and stations on the Buses, Underground, Overground, Light Railway, Trams and River Services networks across the Greater London area.

## TfL and Powered Two Wheelers safety

### 1. Which requirements do you have for riders to qualify for your parking scheme?

In order to take advantage of the free PTW parking offered at TfL HQ buildings, staff have their documentation - driving licence, insurance certificate, MOT certificate- checked, as well as providing evidence of participation on an enhanced/advanced PTW training course.

The riders also have to sign a Code of Practice to ensure that compliance with the Guidelines governing the use of the secure parking area. Any violation of these Guidelines will result in a warning being issued, with the possibility that access to the parking area will be removed.

### 2. Which sort of rider training do your employees have to undergo to apply to the scheme?

The enhanced/advanced rider training can be any one of the recognised schemes being operated in the UK – documentary evidence will need to be provided, to show proof of participation.

### 3. What is the response of your employees to the scheme?

Our employees have been very positive about the scheme, and have shown an eager willingness to participate on enhanced/advanced training for PTWs.

### 4. How do you think this scheme will improve riders' road safety?

By improving their skills and awareness, the chances of our riders being involved in a road collision – with associated injuries - are reduced.

### 5. Is this an incentive for employees to start commuting with PTWs?

One of the main barriers preventing staff commuting is the lack of a secure PTW parking area in the vicinity

of their workplace. By providing such a facility, TfL has encouraged a number of riders to start using a PTW to commute to and from work.

### 6. How does the scheme help ensure that riders perform correct maintenance of their vehicles?

By checking the validity of their vehicle's documentation, staff are encouraged to maintain their PTW.

Within the agreed Guidelines signed by staff, the riders are aware that their access to the secure parking area may be removed if their machine is leaking oil.

### 7. Do you plan to expand the scheme?

The intention is to roll out this scheme to include all TfL HQ buildings, where appropriate space exists to provide suitable PTW parking, and then to expand the scheme to our depots and stations across the whole of the Greater London area.

### 8. Will you propose this scheme to other employers in London?

No formal approach has been made to other employers to introduce a similar scheme at the present time. We are, however, featuring the scheme as part of our on-line Travel Advice Planning and Support (TAPAS) package to businesses, recently published.

### 9. What is TfL doing to improve PTWs in London city?

TfL currently funds 12 full-time Police Officers (2 Sergeants and 10 Constables), who form the Motorcycle Tasking Team (MMT).

The MTT has been tasked with the delivery of BikeSafe and ScooterSafe Assessments to motorcyclists in London ([www.bikesafe-london.co.uk/](http://www.bikesafe-london.co.uk/)), to undertake specific PTW enforcement activity targeting riding standards and rider/vehicle documentation, and to



provide an educational resource for potential or existing young riders to help them understand the issues of riding PTWs.

TfL is also involved in specific advertising campaigns at various times throughout the year, raising the awareness of both riders and car drivers to PTW safety issues.

We are one of four partner cities – along with Barcelona, Paris and Rome – involved in the eSUM (European Safer Urban Motorcycling) Project, which has produced an on-line Good Practice Guide showcasing successful PTW safety interventions around the world. Further details can be found at [www.esum.eu](http://www.esum.eu).

At the conclusion of the Project at the end of the year, eSUM will deliver an Action Pack - both a framework and guidance on the introduction of PTW safety interventions and/or safety plans – for the use of road safety practitioners and local authorities/municipalities across the whole of the EU.

ETSC would like to thank Steve Connolly for his precious contribution.

Questions to Steve can be sent to:  
[Steve.Connolly@tfl.gov.uk](mailto:Steve.Connolly@tfl.gov.uk)



## “PRAISE”: Minimising In-Vehicle Distraction

PRAISE is a project co-funded by the European Commission and implemented by ETSC on Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE). The project aims to advance work-related Road Safety Management and provide the know-how to employers who have to take on that challenge. It also aims to present the work-related road safety standards of EU Member States and carry out advocacy work at the EU level: work-related road safety is an area of road safety policy that clearly needs renewed political commitment.

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## 1. Introduction

This report aims at offering employers insight on how to minimise distractions, but to offer a clear and specific scope it will focus on in-vehicle distractions associated with the use of electronic devices or so-called “nomadic devices” including mobile phones, smart phones, music players and portable navigation devices (PNDs). It aims to provide a source of information and recommendations to employers based on a recently completed longer study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles<sup>1</sup>. Vehicles are increasingly becoming “moving offices”, an environment in which employees are likely to receive or make phone calls, check text messages or even check their emails, unappreciating the enormous road risk that this type of behaviour poses while driving for work.



## 2. Distractions on the roads

Distraction on the roads is a major source of concern. Driver distraction is thought to play a role in 20-30% of all road collisions<sup>1</sup>. There is a long list of distractions, be it in-vehicle distractions that undermine the driver or the rider’s ability to perform the driving task. Distractions that concern pedestrians and cyclists<sup>2</sup> (listening to music players, making phone calls, etc.) is also a concern, especially as more people walk and cycle to work<sup>3</sup>. Research has shown that the use of devices whilst walking or cycling results in an increased crash rate. A survey amongst cyclists has indicated the use of devices increases the crash rate by a factor of 1.44<sup>5</sup>.

This report will focus on the risk associated with the use of electronic “nomadic” devices by drivers. However, the risks covered in this report are by no means an exhaustive list of the distractions employers should manage. Employers should identify and manage all distractions linked to driving for work and ensure that drivers reduce risks by, for example: not eating or drinking while driving; presetting music/radio and climate controls; securing any loose objects; pulling over to adjust equipment, check maps or attend to personal grooming; asking passengers to help with tasks (e.g. checking maps), etc.<sup>6</sup>.

According to a recent study commissioned by the European Commission entitled “Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles”, nomadic devices comprise all portable electronic devices for information, entertainment, or communication that can be used outside of the vehicle and inside the vehicle by the driver whilst driving<sup>7</sup>. This report will look at information and communication devices including mobile phones, smart phones, and portable navigation devices. Employers are however reminded that they should not underestimate the risks also posed by entertainment devices including music or video players or the entertainment applications of smart phones, personal digital assistants or navigation devices, and a ban on the use of such devices for the sake of entertainment whilst driving should be included and clearly mentioned in driving for work policies. Employers should also know their drivers, and in particular identify those most at risk such as young drivers whose technology friendly lifestyles make them prone to distraction while on the road. For example a recent survey of young drivers showed that nearly 60% of young drivers said they had been distracted by adjusting an MP3 player while driving<sup>8</sup>. The following Nomadic Devices Classification can be useful for employers in determining their purchasing and use policies<sup>9</sup>:

Definition	All types of information communication and entertainment devices that can be brought into the vehicle by the driver to be used while driving
Function	Primarily driving related NDs (e.g. PNDs) Non driving related NDs (e.g. mobile phones) Multifunctional NDs (e.g. Smart-phones)
Distraction Form	Physical Visual Auditory Cognitive
Safety	Negative effects (e.g. mobile phones) Ambivalent effects (e.g. PNDs)

While there is research and road traffic collision statistics and investigations attesting to the negative safety effects posed by the use of nomadic

1 IGES Institut, ITS Leeds, ETSC (2010): Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles. Study tendered by the European Commission, Berlin 2010.

[http://www.etsc.eu/documents/Report\\_Nomadic\\_Devices.pdf](http://www.etsc.eu/documents/Report_Nomadic_Devices.pdf)

2 Dews, F. A., & Stayer, D. L. (2009). Cellular Phones and Driver Distraction. In M. A. Regan, J. D. Lee, & K. L. Young, *Driver Distraction Theory, Effects and Mitigation* (pp. 169-190). CRC Press.

3 [http://www.swov.nl/rapport/Factsheets/UK/FS\\_Use\\_of\\_media\\_devices\\_cyclists.pdf](http://www.swov.nl/rapport/Factsheets/UK/FS_Use_of_media_devices_cyclists.pdf)

4 <http://www.etsc.eu/documents/PRAISE%20Report%20%284%29.pdf>

5 *ibid*

6 TAC 2008 [http://www.worksafe.vic.gov.au/wps/wcm/connect/91b8fc004071f37b936cdf1fb554c40/safe\\_driving\\_web.pdf?MOD=AJPERES](http://www.worksafe.vic.gov.au/wps/wcm/connect/91b8fc004071f37b936cdf1fb554c40/safe_driving_web.pdf?MOD=AJPERES)

7 [http://www.etsc.eu/documents/Report\\_Nomadic\\_Devices.pdf](http://www.etsc.eu/documents/Report_Nomadic_Devices.pdf)

8 AAMI (2007) Technology Drives Young People to Distraction: <http://www.aami.com.au/Resources/File.aspx>

9 IGES Institut, ITS Leeds, ETSC (2010) Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles: [http://www.etsc.eu/documents/Report\\_Nomadic\\_Devices.pdf](http://www.etsc.eu/documents/Report_Nomadic_Devices.pdf)

devices (see section below), some devices have ambivalent safety effects (for example personal navigation devices), or even positive effects when used properly. Employers are therefore encouraged to adopt balanced policies based on clear scientific evidence and provide clear and easy to apply guidelines to their employees on acceptable use.

## 2.1 Adverse effects of Devices

There are a large amount of scientific articles documenting the risks associated with distracted driving. In terms of the impact of nomadic devices we can list a number of risk factors. To start with, in contrast to some originally fitted devices (e.g. In-Vehicle Information Systems), retrofitted nomadic devices are most often not designed for use in vehicles due to e.g. small sizes of keyboard and displays<sup>10</sup>. The use of these devices while driving may increase driver distraction due to the additional workload to the (primary) driving task<sup>11</sup>. Drivers can be distracted by the use of nomadic devices while driving in several ways<sup>12</sup>:



- Physical distraction: The driver has to use one or both hands to manipulate the device (e.g. dialling a number on the mobile phone) instead of concentrating on the physical tasks required for driving (e.g. steering, changing gear, etc.);
- Visual distraction: There are three different forms of visual distraction. The first form occurs when the driver's visual field is blocked by objects (e.g. a PND mounted on the windscreen) that prevent him/her from detecting or recognising objects on the road. The second type of visual distraction is caused by the amount of time that the driver's eyes are on the nomadic device and off the road (e.g. looking at the PND display). The third type involves a loss of visual "attentiveness", often referred to as "looking at the road but failing to see". This interferes with the driver's ability to recognise hazards in the road environment;
- Auditory Distraction: This form of distraction occurs when drivers momentarily or continually focus their attention on sounds or auditory signals rather than

on the road environment. This can occur when the driver listens to e.g. the radio or when holding a conversation with a passenger, but is most pronounced when using a mobile phone;

- Cognitive distraction: This form of distraction involves lapses in attention and judgment. It occurs when two mental tasks are performed at the same time. Cognitive distraction includes any thoughts that absorb the driver's attention where they are unable to navigate through the road network safely and their reaction time is reduced. Talking on a mobile phone while driving is one of the most well documented examples of cognitive distraction; however it can also occur when trying to manipulate nomadic devices (e.g. operating a PND) or when paying attention to information conveyed by the devices.

### 2.1.1 Research Findings on Risks of Mobile Phone Use<sup>13</sup>

Much of the literature focuses on the safety implications of mobile phone use. Below are some of the main research findings:

- Redelmeier and Tibshirani<sup>14</sup> (1997) estimate the effect of mobile phone use on the risk of being involved in a substantial property-damage-only crash. The conclusion was that phone use was associated with a fourfold increase in the risk of crash involvement.
- A simulator study carried out by TRL<sup>15</sup> benchmarked use of a mobile phone while driving against impairment from alcohol. The overall conclusion was that driving behaviour is impaired more during a phone conversation than by having a blood alcohol level at the UK legal limit. Speed control (adherence to a target speed) and response time to warnings was poorest when using handheld phone, but even with a hands-free phone performance was worse than in the alcohol-impaired conditions. Drivers also reported that it was easier to drive when alcohol-impaired than when using a phone.
- The U.S. 100 Car Study conducted by Virginia Tech<sup>16</sup> found that distraction was a major safety issue. Inattention was a contributory factor in 93% of the incidents with lead vehicles. Phone and PDA

10 Gil-Castañeira, F., Chaves-Diéguez, D. & González-Castaño, F. (2009): Integration of Nomadic Devices with Automotive User Interfaces. In: IEEE Transactions on Consumer Electronics, 55 (1), pp. 34-41.

11 Santos J., Merat, N., Mouta S., Brookhuis K. & De Waard D. (2005): The interaction between driving and in-vehicle information systems: Comparison of results from laboratory, simulator and real-world studies - Transportation Research Part F: Traffic Psychology and Behaviour, 8 (2). pp. 135-146.

12 Young, K.; Regan, M.; Hammer, M. (2003): Driver Distraction: A Review of the Literature, Monash University Accident Research Centre Report 206. Breen, J. (2009): Car telephone use and road safety: final report. An overview prepared for the European Commission. Available at [http://ec.europa.eu/transport/road\\_safety/specialist/knowledge/mobile/car\\_telephone\\_use\\_and\\_road\\_safety.pdf](http://ec.europa.eu/transport/road_safety/specialist/knowledge/mobile/car_telephone_use_and_road_safety.pdf) (retrieved 22 February 2010).

13 This is a summary of a longer overview of research which can be found in (IGES Institut, ITS Leeds, ETSC (2010) on pps 22-26

14 Redelmeier, D.A. & Tibshirani, R.J. (1997): Association between cellular telephone calls and motor vehicle collisions. In: New England Journal of Medicine, 336(7), pp. 453-458.

15 Burns, P.C., Parkes, A., Burton, S., Smith, R.K. & Burch, D. (2002): How dangerous is driving with a mobile phone

16 Dingus, T.A., Klauer, S.G., Neale, V.L., Petersen, A., Lee, S. E., Sudweeks, J., Perez, M.A., Hankey, J., Ramsey, D., Gupta, S., Bucher, C., Doerzaph, Z.R., Jermeland, J. & Knippling, R.R. (2006): The 100-car naturalistic driving study: phase II – results of the 100-car field experiment. Report DOT HS 810 593. National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington D.C.

use was a major factor in the incidents.

- Also part of the 100 Car Study<sup>17</sup>, identified various types of inattention. Complex secondary tasks (tasks requiring multiple steps, multiple eye glances or multiple button presses) included dialing on a handheld device, locating/reaching for and answering a handheld device, operating a PDA and viewing a PDA screen were identified as increasing the risk of being involved in a crash or near-crash three-fold. Moderate secondary tasks (defined as those requiring up to two glances away from the roadway or up to two button presses) included talking on or listening to a handheld device were identified as doubling risk as compared with attentive driving.
- A more recent naturalistic driving study focused on driving in trucks<sup>18</sup>. Texting was the most risky behaviour identified: it was calculated to increase risk of being involved in a safety-critical event by a factor of 23.2. Dialing on a mobile phone increased risk by a factor of 5.9, whereas talking on or listening to a mobile phone had a negligible and non-significant effect on risk. Use of or reaching for other electronic devices such as a video camera or two-way radio increased risk by a factor of 6.7. The results in terms of population-attributable risk were somewhat different: texting, while highly risky, was not all that frequent, being associated with only 0.7% of all events, whereas dialing on a mobile phone was associated with 2.5% of the events and interaction with a dispatching device with 3.1% of the events. This points out the need to ensure that texting does not become more prevalent.
- By combining estimates of increased risk from the use of mobile phones with observation data, it is possible to calculate the overall number of injuries attributable to mobile phones. Dragutinovic and Twisk<sup>19</sup> (2005) carried out such a calculation for the Netherlands: in 2004, 585 traffic injuries and deaths were attributable to mobile phone use. This represented 8.3% of the total, and constituted 4.5 times the estimated number for 1995.

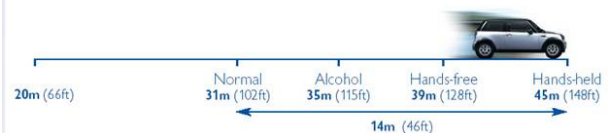
### 2.1.2 Hands-free also poses significant risk

Of particular interest is the fact that different research

from around the globe has identified talking on the phone with “hands-free” systems as posing a very significant risk while driving. According to Noble and Riswadkar<sup>20</sup> (2009) a number of studies have tried to make a distinction between the use of hands-free versus hand-held and for the most part “simulator and on-road studies have concluded that the use of hands-free devices did not reduce the impact on reaction time and driver distraction”. This is because while hands-free may address the physical distraction, the interactive conversation on a mobile phone demands cognitive resources (this is the cognitive distraction mentioned above) “and this is believed to be primarily responsible for distracted driving”<sup>21</sup>. The same can be found in RoSPA’s mobile phone guidelines on driving for work concerning hands-free: “using a hands-free phone while driving does not significantly reduce the risks because the problems are caused mainly by the mental distraction and divide attention of taking part in a phone conversation at the same time as driving”<sup>22</sup>. Below, a number of additional research conclusions that have investigated the effect of hands-free:

- Research from Western Australia, published in the British Medical Journal<sup>23</sup>, found that driving while talking on a mobile phone – whether hand-held or hands-free – increases the risk of a collision by four times.
- In the UK the Transport Research laboratory (TRL)<sup>24</sup> identified the following stopping distances with different levels of impairment:

Distance travelled before response at 70mph



Distance travelled before response at 70 mph (113 kmph)

- More recent research by the University of Utah<sup>25</sup> shows that driving performance is dramatically impaired when using a hands-free mobile phone for 97.5% of drivers. Drivers on hands-free mobile phones took 20% longer to hit the brakes when needed.
- According to a survey undertaken in 2010<sup>26</sup> 20% of German drivers telephone whilst driving even whilst 90% were aware of the risks.

17 Klauer, S.G., Dingus, T.A., Neale, V.L., Sudweeks, J.D. & Ramsey, D.J. (2006): The impact of driver inattention on near-crash/crash risk: an analysis using the 100-car naturalistic driving study data. Report DOT HS 810 594. National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington D.C.

18 Olson, R.L., Hanowski, R.J., Hickman, J.S. & Bocanegra, J. (2009): Driver distraction in commercial vehicle operations. Report FMCSA-RRR-09-042. Federal Motor Carrier Safety Administration, U.S. Department of Transportation, Washington D.C.

19 Dragutinovic, N. & Twisk, D. (2005): Use of mobile phones while driving – effects on road safety. A literature review. SWOV Institute for Road Safety Research Report R-2005-12. Leidschendam, 2005.

20 Noble, J. & Riswadkar, A.V. (2009), Cell Phone Liability for Employers. The John Liner Review, quarterly review of advanced risk management strategies 23 (1). PP 73-79.

21 Noble, J. & Riswadkar, A.V. (2009), Cell Phone Liability for Employers. The John Liner Review, quarterly review of advanced risk management strategies 23 (1). PP 73-79.

22 RoSPA (2009) Driving for Work, Mobile Phones. <http://www.rospa.com/roadsafety/info/workmobiles.pdf>

23 <http://www.bmj.com/content/331/7514/428.abstract>

24 Burns, P.C., Parkes, A.M., Burton, S., Smith, R.K., And Burch, D. (2002). How dangerous is driving with a mobile phone? Benchmarking the impairment to alcohol. TRL Report TRL547. Crowthorne, UK. TRL Ltd.

25 <http://www.psych.utah.edu/lab/appliedcognition/publications/supertaskers.pdf>

26 [http://www.dekra.de/de/pressemitteilung?p\\_p\\_lifecycle=0&p\\_p\\_id=ArticleDisplay\\_WAR\\_ArticleDisplay&ArticleDisplay\\_articleID=3607558](http://www.dekra.de/de/pressemitteilung?p_p_lifecycle=0&p_p_id=ArticleDisplay_WAR_ArticleDisplay&ArticleDisplay_articleID=3607558)

Very striking is the fact that talking on the phone, even with hands free, is identified as even more dangerous than drink driving which is now anchored in people's minds as something that is not only illegal but also very dangerous and socially unacceptable. While it will take some time for the general population of drivers to accept and internalise in a similar way the risk posed by the use of telephones while driving, it is very important for employers to be made aware of this risk, both of hand held and hands free mobile phone use, and it should be reflected in their driving for work policies. There are already positive examples from companies who also ban the use of hands free.

## 2.2 Benefits and ambivalent effects

### 2.2.1 Portable Navigation Devices

Overall, there is consensus about the negative impact of certain devices on road safety (e.g. mobile phones). In contrast, some nomadic devices may have benefits, or rather an ambivalent safety effect<sup>27</sup>. When used properly, portable navigation devices (PNDs) for instance can have a positive impact, since these devices can ease the task of driving and the routes followed are shorter, so that stress and exposure to "danger" is reduced. However, they can have a negative impact if they are operated by the driver while driving or if the advantage of taking shorter routes is cancelled out if the shorter route follows roads with higher risk by directing traffic through small centers of habitation or along unsuitable roads (e.g. distributor roads)<sup>28</sup>. The main safety benefits of PNDs are:

- Less exposure: the main purpose of navigation systems is to find a suitable route to one's destination. The user can usually choose between the fastest and the shortest route.
- Less getting lost and more attention to traffic: a navigation system ensures that the user does not have to do as much searching for a route or street. As a result, they can devote more attention to the surrounding traffic and, moreover, drive more directly to the destination (less exposure). Both effects are good for road safety. A Dutch survey<sup>29</sup> notes that almost 60% of the respondents use the system because it "reduces the effort of driving".
- Traffic information: navigation system with information on the current traffic situation can give the user early warning

of upcoming traffic problems including congestion.

- Another new function allows receiving job instructions via the device. This reduces the need to phone from the vehicle (the jobs and messages on the device can be read aloud) and the administrative burden can also be reduced since mileage and working time may be monitored with a single tab on the screen, reducing the paperwork on the road.

What is most important however is for drivers to be aware that such devices should be used correctly, mainly this means not interfering with the device while driving. In another Dutch survey<sup>30</sup> a majority of users considered it dangerous to adjust the system while driving yet 64% of them said that they did so sometimes or frequently. So despite the safety benefits of PNDs there also is a clear risk to manage. It is therefore not the devices in themselves that are safe or dangerous but it is the way users use them, and this is something that employers should manage. Proper use also includes frequently updating navigation systems, as out-of-date or incorrect information can lead to wrong decisions: undesirable or unsuitable routes (through traffic via streets in residential areas, heavy goods vehicles through town centres) or even incorrect routes (one-way traffic, physical obstructions, roadworks, roads with height limitations, viaducts and bridges unable to bear the vehicle's weight). Nearly half of the respondents in the DVS study<sup>31</sup> mentioned above knew how long ago their own map had been updated, however about 60% had not refreshed the map details in the past two years. Important reasons for not doing so were cost (36%) and that it was too much trouble (19%). Important reasons for doing so were notification of an available update (over 15%) and 'it's time to do so' (over 25%). Incidents of taking the wrong route or receiving wrong advice were barely cited as reasons for updating. Another recent study by the BAST<sup>32</sup> looked at the effects of new information technologies on driver behavior and ran a trial of an "information" manager which divided information into categories such as "driver-initiated or vehicle-initiated" or "safety relevant". The large scale field test concluded that such an information manager can lead to a more "relaxed driving style" and higher levels of road safety. Finally, research shows that visual information will distract the driver's attention from the driving task more than the audio information<sup>33</sup>. This is therefore also probably something that should be told to drivers when managing the use of navigation systems.

27 IGES Institut, ITS Leeds, ETSC (2010) Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles: [http://www.etsc.eu/documents/Report\\_Nomadic\\_Devices.pdf](http://www.etsc.eu/documents/Report_Nomadic_Devices.pdf)

28 SWOV (2009): Safety of navigation systems. SWOV Fact sheet January 2009, Leidschendam

29 DVS (2008). Analyse nadelige effecten navigatiesystemen op routekeuze. Gebruik en misbruik van egen; deel 2. Rijkswaterstaat, Dienst Verkeer en Scheepvaart, Delft.

30 Oei, H.L. (2002). Mogelijke veiligheidseffecten van navigatiesystemen; Een literatuurstudie, enkele eenvoudige effectberekeningen en resultaten van een enquête. R-2002-30. SWOV, Leidschendam.

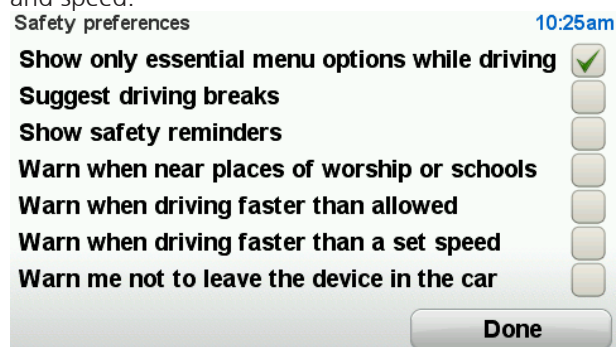
31 DVS (2008). Analyse nadelige effecten navigatiesystemen op routekeuze. Gebruik en misbruik van egen; deel 2. Rijkswaterstaat, Dienst Verkeer en Scheepvaart, Delft

32 BAST (2003) Auswirkungen neuer Informations-technologies auf das Fahrerverhalten [http://www.bast.de/nn\\_42640/DE/Publikationen/Berichte/unterreihe-m/Functions/Berichte-M,param=3.html](http://www.bast.de/nn_42640/DE/Publikationen/Berichte/unterreihe-m/Functions/Berichte-M,param=3.html)

33 Verwey, W.B. & Janssen, W.H. (1988). Route following and driving performance with in-car route guidance systems. Report IZF 1988 C-14. TNO Institute for Perception IZF, Soesterberg

## 2.2.2 ITS Services on PNDs for Professional Drivers

Under the ITS Directive the year 2013 will see the adoption of specifications for real-time traffic information systems and for systems to reserve available parking lots. ETSC recognises the potential benefits that this could have especially for HGV drivers who would be able to plan their routes and find a rest area without jeopardising their maximum driving time. Research shows that driver fatigue is a significant factor in approximately 20% of commercial road transport crashes<sup>34</sup>. Better availability of parking and information as well as data exchange on this subject will help drivers plan and take their breaks more efficiently. Example of a screen shot of a PND including possible safety features linked to fatigue, managing driving time and speed:



Another EC funded project has tackled this topic: the project Heavyroute<sup>35</sup> focussed on applying and combining existing and newly developed systems, technologies, databases and models to develop an advanced HGV management and route guidance system. It noted that the use of mapping systems based on satellite guidance has increased dramatically and is providing major benefits to

professional drivers. However, drivers may find themselves on inappropriate routes for their vehicle. Working with all the major stakeholders, the Heavyroute project worked to provide the tools, the systems and the data collection and interpretation processes that will effectively link Europe's road infrastructure via electronic mapping systems to the truck operators and drivers. The project was completed in 2009.

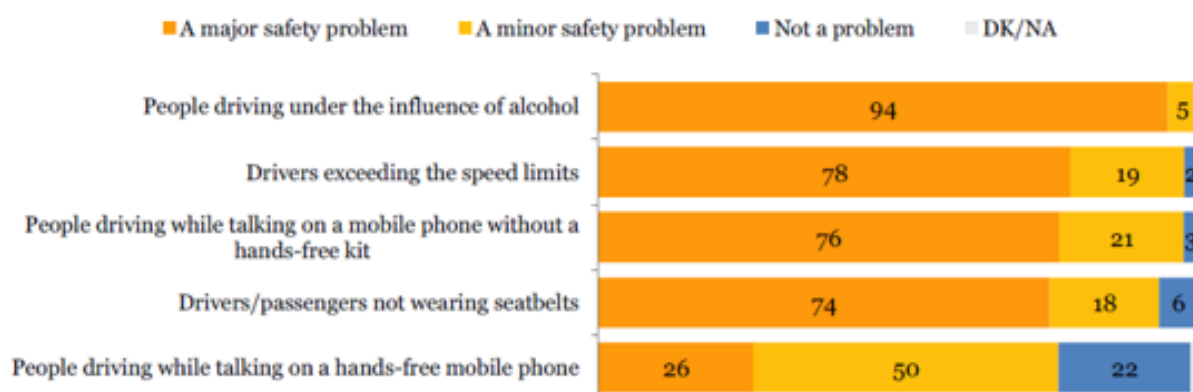
## 2.2.3 Mobile phones

There are good health and safety reasons for lone workers and staff who travel in areas where summoning help may be difficult<sup>36</sup> to have a mobile phone at hand. The most obvious positive safety/security effect of mobile phones regards the post crash phase. Clearly a road user is able to call emergency services more quickly if they have a mobile phone, especially if the crash occurs in an isolated environment. Over the long-term when vehicles gradually become equipped with systems such as eCall that automatically call emergency services in the event of a serious crash, this benefit of having a mobile phone might become less important.

## 2.3 Current situation: users' behaviour

As mentioned above, users are probably not aware of the risks associated with distracted driving as much as they are aware of other risks such as drink driving. A recent European 'Eurobarometer'<sup>37</sup> opinion poll survey demonstrates that while 94% of people considered "driving under the influence of alcohol" a major road safety problem, this number was 76% for talking on a mobile phone without hands-free, and as little as 26% for talking on a mobile phone with hands-free (see below).

### Perceptions about the seriousness of road safety problems



Q2. In terms of road safety, do you feel the following constitutes a major safety problem, a minor safety problem, or is not a problem [IN OUR COUNTRY]?  
Base: all respondents, % EU27

European Commission Road Safety Eurobarometer 2010

34 <http://www.etsc.eu/documents/drivfatigue.pdf>

35 <http://heavyroute.fehrl.org/?m=1>

36 RoSPA (2009) Driving for Work, Mobile Phones. <http://www.rospa.com/roadsafety/info/workmobiles.pdf>

37 [http://ec.europa.eu/public\\_opinion/flash/fl\\_301\\_en.pdf](http://ec.europa.eu/public_opinion/flash/fl_301_en.pdf)



High mileage and company car drivers are also more likely than most to use a mobile phone while driving<sup>38</sup>. Very often it is the employers who provide mobile phones or reimburse the cost of work-related calls made on private ones<sup>39</sup>, this might reinforce employees' misconception that they are expected to be reachable at anytime.

Recently a survey by ING Car Lease<sup>40</sup> in the UK also concluded that the recession is encouraging more company car drivers to take calls when behind the wheel. The survey found that while 61% of company car drivers questioned felt under greater pressure to take or make calls while driving, 39% of respondents admitted to having previously texted or emailed while behind the wheel. Further, 16% did not know whether the company had a mobile phone policy. If the figure in the survey is an accurate representation of all company car drivers in the UK, then as many as 1,755,000 drivers could be texting or emailing behind the wheel, calculates ING<sup>41</sup>.

According to a recent survey<sup>42</sup> by the Austrian Road Safety Board (KfV) almost every third driver reads text messages whilst driving. A total of 14 % of the 1,000 respondents admitted to writing SMS behind the wheel. When writing a short message it takes the driver five seconds to react to a hazard. The same study found 78 % of respondents said they occasionally make phone calls whilst driving. The understanding of the risks amongst motorists is low: 15 % of respondents believe the ability to drive whilst using a mobile phone would be little or not affected.

### 3. How to manage the risks?... without losing the benefits

Distracted driving, including the use of electronic devices while driving, should be a particular source of concern for employers and a risk that is managed properly within driving for work policies.

#### 3.1 Adopting a Policy for managing distracted driving

##### Business Case

Duty of care and health and safety compliance are legal necessities in most EU Member States, and an essential consideration for employers. Employers should also make sure that their employees are able to comply with the law for example on using work equipment in a safe manner. But equally important, it makes sound business sense to draw up and implement a safe driving for work policy. This should include measures to manage distracted driving. If 'driving for work', being 100% focused on the driving task should be an expected part employee behaviour. The

business case for adopting a policy for managing distracted driving should cover the following benefits:

- Fewer working days lost due to death and injury;
- Reduced risk of work-related ill health;
- Reduced stress and improved morale / job satisfaction;
- Less need for investigation and paperwork;
- Less lost time due to work rescheduling;
- Reduced insurance costs;
- Reduced vehicle downtime;
- Reduced vehicle repair costs;
- Improved residual value of vehicles;
- Image of company shown to care for employees;
- Fewer missed orders and business opportunities;
- Reduced damage to company brand and risk of losing the goodwill of customers;
- Focus on driving tasks leading to more efficiency;
- Less chance of key employees being banned from driving.

The risk associated with distracted driving and the use of mobile phones and electronic devices should clearly be reflected in driving for work policies, and employers should also ensure that the policy is clearly articulated and broadly communicated so that employees are aware of the existence of the policies (for example by reading the policy out loud with the employee upon employment or getting the employee to sign a declaration or a 'pledge', rather than simply handing out a few pages for the employee to read). If a company is providing mobile phones, at the very least employees should be required to sign and acknowledge that they have received, understood and will comply with the company policy<sup>43</sup> (Noble & Riswadkar, 2009). Best practice is to ask employees to undertake comprehension checks – this forces them to read the material at least once, and increases the chance that they will follow the advice given – it also provides a very robust audit trail for the employer as not only can the prove that they have given these documents to the employee, but that they have also read and understood them. Policies should also be uniformly enforced (see section 3.2).

38 RoSPA (2009) Driving for Work, Mobile Phones. <http://www.rosipa.com/roadsafety/info/workmobiles.pdf>

39 ibid

40 <http://www.roadsafe.com/news/article.aspx?article=1023>

41 ibid

42 <http://www.kfv.at/kuratorium-fuer-verkehrssicherheit/publikationen/studien/verkehr-mobilitaet/>

43 Noble, J. & Riswadkar, A.V. (2009), Cell Phone Liability for Employers. The John Liner Review, quarterly review of advanced risk management strategies 23 (1). PP 73-79.

A number of samples of distracted driving / mobile phone/ electronic device policies and guidelines are available on-line for employers to draw from<sup>44</sup>. Employers can either adopt or adapt such policies to suit their needs. One important consideration is to what extent driving for work policy will cover employees driving employer owned vehicles or their own vehicles whilst on business (grey fleet). Employee responsibility for their own vehicle, phone and electronic devices needs to be clearly outlined in the policy. Employers can have a huge influence in fostering improved road safety compliance for employees using their own vehicles and equipment for work purposes. Large employers can also influence policies in Small and Medium Enterprises [SME's] when they subcontract out work further along the supply chain by insisting that subcontractors adopt the same conditions and standards in relation to driving for work. Main elements of a policy for mobile phones or electronic devices should typically include the following (adapted from RoSPA, 2009; TAC, 2008:

- Employees must not make or receive calls whilst driving for work.
- The golden rule "Engine on, phone off": if it is necessary to make a call, stop in a safe place that does not pose a hazard for other road users.
- Allow calls to go on "voicemail" with a message such as: "You have reached Mr Smith. I'm sorry I can't take your call because I'm driving my car or am otherwise engaged. It is my company's policy not to use mobile phones while driving for work. I will call you back as soon as I am free and it is safe to do so. If your call requires an immediate response, please call... [customer service number or an alternative designated number]."
- Plan journeys ahead to include stops that also provide opportunities to check messages and return calls.

Other members of staff must also know about the policy and not call a colleague when they know that they are likely to be driving. The caller should check if the person is driving and if they are, hang up.

Swisscom Schweiz AG (in box)

Swisscom a large telecommunications company in Switzerland has launched a fatigue and distraction campaign in 2010 targeting all employees (4,000 fleet cars). This fits into its Vision 0 serious and fatal accidents. The goals are to improve road safety of employees; prevent damage to their image and operational disturbance and reduce vehicle damage. The measures adopted include

disseminating information to all employees, sending a newsletter fleet car drivers, education and instruction of multipliers. This includes branch managers, safety agents and superiors. Exhibition with panels in 32 buildings are also arranged as are quizzes and prizes, involving all employees and apprentices, some of whom attend the exhibition. The campaign was evaluated and the results have been very positive.

### Chemical Company, UK<sup>45</sup>

A chemical company based in the UK, with a small pan-European car fleet for the sales force, decided in the mid 1990's to implement a ban on using hand-held and hands-free telephones whilst driving. The Sales Director was concerned that this would lead to a loss of business, so measures were put in place to ensure that this did not happen. The back office team was strengthened and customers were told about the new policy and advised to call the office with any queries. In parallel, the employees were shown how their own driving deteriorated, in an off-highway setting, to foster buy-in from them.

When the organisation's customers were asked what they thought of the service they were getting, they actually reported that it had improved following the ban on the sales team using their telephones whilst driving. This was because the most usual enquiry was concerning their orders which the back office team were able to answer more quickly, eliminating the need for any intermediate calls to the sales person. The sales team also reported that their driving was less stressful, and that they were able to respond to calls more professionally when parked-up as this gave them time to think exclusively about the issue without the distraction of driving. As an added benefit, the monthly mobile telephone bills were reduced by approximately 20%

### 3.1.1 Communications and Time Management

Further, senior managers should be expected to lead by example, they must never make or receive a call on a mobile phone while driving for work or expect their colleagues to do so. It is the role of the top management to make sure that systems of work do not pressurise staff to use a mobile phone while driving for work. This includes looking at employee to employee communication systems in place. These may have

<sup>44</sup> Examples include: <http://www.rospa.com/roadsafety/info/workmobiles.pdf>, [http://www.tacsafety.com.au/upload/Safe\\_Driving\\_Policy.pdf](http://www.tacsafety.com.au/upload/Safe_Driving_Policy.pdf), Shell E&P Ireland Ltd (SEPIL) "The use of mobile phones - even with hand-free kits - is prohibited" <http://www.erscharter.eu/signatories/profile/17600>

<sup>45</sup> Example given by Andrew Price now at Zurich Financial Services.

to be dramatically changed, for example back office staff will no longer automatically put clients through to employees who may be engaged in the driving for work task. Following an analysis of the way the working day is structured this may also be changed to enable those who are driving for work to integrate time for catching up with phone calls and emails. This can also link with an organizations fatigue management policy – best practice is to take a 15-20 minute break from driving every 2h, or sooner if you feel tired. Whilst the driver should get out of their vehicle and stretch their legs, this is also an excellent opportunity to catch up on messages and make calls. Structuring the day also includes for example not scheduling phone conferences during commuting (driving) time. Managers should also be held accountable for policy enforcement.

### 3.1.2 Recommendations to employers

- Senior managers to take the lead by respecting the distracted driving policy.
- Adopt a clear policy against distracted driving / use of mobile phones and other electronic devices while driving for work, including as a minimum: “engine on, phone off” and asking staff to put their phone on voicemail with an appropriate message.
- Undertake a review of communication strategies and tools in place.
- Communicate to staff the reasons why policies are in place: hands-free can be as dangerous as hands-held, and having a mobile phone conversation while driving is as bad or even worse than drink driving in terms of risk.
- Ensure there is a mechanism in place to verify such as a training session to ensure that employees including management level are aware and understand existing driving for work policies.
- Create a safety culture: management should ensure work practices that do not pressurise staff to use a mobile phone or another electronic device while driving.
- Lead by example: top executives should lead by example and never make calls / text/ check emails devices while driving for work.
- If mobile phones are given to staff or calls reimbursed, staff should be clear that this is subject to employees respecting company policies.

- Regarding Navigation Devices: ensure that HGVs are equipped with adequate tailor-made navigation systems; ensure navigation systems are updated regularly to minimise the risk of wrong information; Purchase Head-up display for speed and navigation information; consider buying and installing navigation devices where manual interaction is not possible when the vehicle is moving
- otherwise prohibit interaction with the devices while driving for work; advise drivers to rely more on audio rather than visual information, inform employees on correct location for mounting PND devices.

### 3.2 Employer-led Approaches through Technology and Telematics

Legislation against distracted driving and the use of nomadic electronic devices is hard to enforce by traditional means (traffic police)(more on this in section 4). Unless the enforcement is strong enough, laws are not likely to discourage drivers from using a mobile phone while driving, for example<sup>46</sup>. Further, the primary goal of company policies should be to prevent an undesired outcome for the organisation, but having a policy in place does not necessarily guarantee a successful defence in every case<sup>47</sup>. So reducing the risk does not only mean developing a policy, but also managing the risk proactively and uniformly through collective and individual measures across the company by setting up an monitoring process as part of the company safety management system, for example through technology or using telematics. Promotion of safety policy can range from very simple measures, for example some companies have chosen to place a warning sticker on company-provided phones reminding individual employees about the dangers of distracted driving<sup>48</sup>, to much more advanced solutions. Suckling Transport for example, a company specialised in the transport of fuel by road, as a collective measure, introduced an interlock between a fixed mobile telephone in the cab of the vehicle to the handbrake, to ensure the telephone can only be used when a vehicle is stationary<sup>49</sup>. Telematics providers can also offer their customers the possibility to enforce their policies by using mobile phone records in conjunction with telematics reports

46 Noble, J. & Riswadkar, A.V. (2009), Cell Phone Liability for Employers. The John Liner Review, quarterly review of advanced risk management strategies 23 (1). PP 73-79.

47 ibid

48 ibid

49 <http://www.etsc.eu/documents/PRAISE%20Fact%20Sheet%202.pdf>

to identify occasions when drivers are using their telephones whilst the vehicle is in use. With driver safety forming a larger and more comprehensive part of any fleet management solution, there has been an increase in companies looking for in-vehicle telematics to support behaviour-based reporting. With lone worker legislation on the rise and the onus put squarely on the employer to protect both his mobile employee and those he/she may come in contact with, it is imperative to be able to identify any potential risk. One provider, Trimble<sup>50</sup> has recently launched a Driver Safety solution that can measure and benchmark the driving of an individual to allow organisations to understand the risk associated with their drivers' style, thus allowing them to mitigate poor behaviours using methods such as training and incentives. Offering GPS location information as well as behaviour data such as harsh braking, acceleration, speeding and cornering, the solution provides high level and detailed reporting of those drivers displaying dangerous driving behaviour and therefore most likely to be in an accident. With mobile phones proven to be a hazardous distraction while in the vehicle, this telematics driver-style information can now be matched to loaded mobile phone usage records to determine where a driver was when they used their phone, if they were in motion and then if this usage was associated with poor driving style or inappropriate behaviour. The reports can be sent to a number of different stakeholders from Fleet Managers to HR who can then determine the action to be taken. To gain maximum benefits from this tool, experience shows that if used, it should be used as part of an integrated driving for work distraction policy always in conjunction with employers and employees.

## 4. National level

Much can be done to tackle distracted driving at a national government level both in terms of targeting the general population and those drivers driving for work.

### 4.1 Awareness

Traffic law enforcement is not only about identifying and apprehending offenders. What guides people's behaviour is not only the fear of being caught but also their understanding of the road safety rules themselves and of the risk related to breaking these rules. The majority of road users want to comply with these rules not to avoid fines but simply to abide by the law<sup>51</sup>. Awareness about

the existing legislation and the risks associated with mobile phone and PND use seems to vary. Firstly, governments should clearly communicate the legal requirements covering both mobile phone and PND use. According to a recent questionnaire of citizens in 5 EU MSs (Spain, UK, Italy, Sweden and Poland)<sup>52</sup> (conducted by IGES Institut, ITS Leeds, ETSC 2010) citizens show a lack of awareness about legislation. The area they were most informed about was mobile phone legislation. Ownership of a nomadic device did not affect knowledge about the legal requirements of their use. Secondly as part of this information campaign government should also explain what are the risks of driver distraction. To maximise the impact of such awareness raising campaigns these should be carried out in parallel with traffic law enforcement<sup>53</sup>. Researchers also underline this and stress that enforcement must be highly visible and publicised and indicate that it is the drivers' subjective risk of being caught that must be increased if enforcement is to be successful<sup>54</sup>. Communication campaigns linked to police enforcement are very important in doing this.

### 4.1.2 National Level Examples of Campaigns

#### UK "Kill the Conversation"

In May 2009, THINK! launched a multimedia campaign to show the dangers of using mobile phones while driving<sup>55</sup>. The campaign was aimed at all drivers with particular emphasis on young/new drivers. It is also aimed at callers and people who text while driving. This was a high-profile multimedia campaign using TV, online, radio and press. The television commercial 'Split Screen' was originally run in March 2007 and shows a wife calling her husband on his mobile phone and the repercussions of her actions. The aim was to broaden the responsibility to the caller and promote the message to 'Kill the conversation'. On-line the 'driving challenge' game was launched in June 2008 and demonstrated how using a mobile phone at the wheel causes unintentional blindness. The game promoted the message to 'Switch off before you drive off'. A radio campaign was also launched warning young drivers of the dangers of texting while driving. The radio campaign promotes the message 'Don't use your mobile when you're driving'. The campaign also advised those who needed their phones for work to switch their phones to voicemail and pick up messages when safely parked.

#### Belgium "No Phone at the wheel"

During the summer of 2010 the Belgian Road Safety Institute (IBSR/BIVV) ran a campaign to highlight the risks associated with mobile phone use while driving<sup>56</sup>.

50 [www.trimble.com/ukmrm](http://www.trimble.com/ukmrm)

51 Goldenbeld, C., Heidstra, J., Christ, R., Mäkinen, T. & Hakkert, S. (2000): Legal and administrative measures to support police enforcement. Deliverable 5 of the ESCAPE (Enhanced Safety Coming from Appropriate Police Enforcement) project. Available at <http://virtual.vtt.fi/virtual/proj6/escape/deliver.htm>

52 IGES Institut, ITS Leeds, ETSC (2010): Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles. Study tendered by the European Commission, Berlin 2010.

53 In line with the EC Recommendation of 2004 on enforcement of traffic law

54 ESCAPE <http://virtual.vtt.fi/virtual/proj6/escape/deliver.htm>

55 [http://www.dft.gov.uk/think/focusareas/invehiclesafety/mobilephones?page=Campaign&whoareyou\\_id=](http://www.dft.gov.uk/think/focusareas/invehiclesafety/mobilephones?page=Campaign&whoareyou_id=)

56 <http://www.ibsr.be/main/OnzeCampagnes/Archief/DetailCampaign.shtml?detail=900203656&language=fr>

The poster is illustrated with a cell phone destroyed on the screen, a picture of a child and the slogan “Dad, it was cut ...”. The goal is to educate drivers on the consequences of an death while playing on the emotional aspect. The simple slogan “no mobile phone whilst driving” makes clear the rule that drivers must observe to avoid such a situation. A second version of this poster is particularly aimed at young male drivers. It consists of a photo of a young woman and the text “Loulou, why did you hang up?”. In this case also, the context is clear. The poster campaign is run along the main roads and posters in smaller format were displayed in public services, youth centers, cultural centers, and businesses. Besides the poster, the campaign message will also be broadcast via variable message signs (VMS) in tunnels in Brussels, but also on highways in Wallonia. Germany “Who is driving?”

The German Road Safety Council organizes every year in cooperation with the Berufsgenossenschaften (Statutory Accident Insurance) from different industrial sectors a quiz focusing on one specific topic. As employers are members of these statutory accident insurances they receive a package of materials (posters, leaflets) to disseminate them in their companies. Employees are invited to take part in a quiz. In 2002, the topic was distraction and a billboard was designed and put also along the German Autobahns to support this company-related actions.

## ... und wer fährt?



<http://www.dvr.de/site.aspx?url=html/presse/plakate/478.htm&mode=2>

Example of a Campaign Targetting Pedestrians  
Check: “tune into traffic” on “you tube” as example of a spot.

ANIA Italy contacted for info on their campaign on distracted driving

### 4.2 Legislation

Legislation on mobile phone and nomadic devices differs in the EU.

#### 4.2.1 Mobile Phone Use

All EU Member States, apart from Sweden<sup>57</sup>, have specific legislation on mobile phone use<sup>58</sup>. They also stipulate the use of hands-free equipment. With regards to hands-free, most commonly a headset or wireless equipment (e.g. Bluetooth) is considered sufficient, as long as the driver doesn’t hold the phone in their hands while driving. However, some countries additionally require that the phone must be fixed in a mounting. Furthermore, some countries (e.g. Luxembourg, Slovenia, and Greece) have even more specific regulation in place that restricts using mobile phones or mounting mobile phone cradles in several ways. In these countries, for instance, the use of additional phone functions (e.g. texting) is prohibited. In some countries, (e.g. Germany) hands-free devices must be used for using any function of a mobile phone (e.g. GPS). In only ten countries is it explicitly forbidden to use the texting function.

57 In Sweden, legal requirements on the use of mobile phones while driving are derived from a general caution “to avoid accidents, road users shall observe care and attention that the circumstances demand”.

58 IGES Institut, ITS Leeds, ETSC (2010): Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles. Study tendered by the European Commission, Berlin 2010

Country	Legislation requires		Hand-held phone is prohibited if		Requirement to use		Hands-free required when using		Forbidden to use			Requirements concerning	
	complete ban	use of hands-free equipment	engine is running	vehicle is moving	headset/Bluetooth	additionally fixed phone	phone function	other function	texting function	all functions that involve continuous handling	headphones	location of mounting	way of fixing
AT		X		X	X		X						
BE		X	X		X		X	X					
BG		X		X	X		X	X					
CY		X		X	X		X		X				
CZ		X		X	X		X	X					
DE		X	X		X		X	X	X				
DK		X	X		X		X	X					
EE		X		X	X		X						
EL		X		X		X	X	X	X				X
ES		X	X				X			X			
FI		X		X	X		X	X		X			
FR		X		X	X		X	X	X				
HU		X	X		X		X						
IE		X	X		X		X						
IT		X		X		X	X	X	X				
LT		X	X		X		X	X		X			
LU		X		X		X	X		X	X			X
LV		X		X	X		X		X				
MT		X		X		X	X						
NL		X		X	X		X	X					
PL		X		X	X		X	X					
PT		X		X	X		X	X	X	X			
RO		X		X	X		X						
SE													
SI		X		X		X	X	X	X	X			
SK		X		X	X		X	X					
UK		X	X		X		X	X					
CH		X		X	X		X	X	X				
IS		X	X		X		X						

Table: Legislation on mobile phone use<sup>59</sup>

59 IGES Institut, ITS Leeds, ETSC (2010): Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles. Study tendered by the European Commission, Berlin 2010.

### 4.2.2 PND use and Mounting Legislation

This area is less regulated than mobile phone use<sup>60</sup>. Only 12 EU countries have general legislation in place that applies to some extent to mounting and using PNDs. Where there is legislation these countries indicate that manual interaction with the device is prohibited when the vehicle is moving. This restriction can either be derived from general articles on driver behaviour (e.g. driving without due care and attention) or general articles on vehicle condition (e.g. vehicle's front window/windscreen must allow a clear view). For some countries it is not fully clear to which extent these general articles apply to the use of PNDs. For instance in Sweden, the relevant general articles on driver behaviour do not stipulate a concrete prohibition for the driver to manually interact with a PND when driving, as long as no other road user or traffic is endangered or the driver doesn't behave recklessly. Other countries (e.g. France, Italy, Slovenia) have ruled from these general articles on driver behaviour that manual interaction with a PND is not allowed.

Country	Legislation requires		Manual interaction prohibited if		Prohibited to use		Requirements concerning	
	complete ban	use restriction	engine is running	vehicle is moving	media player function	other functions	location of mounting	way of fixing
AT								
BE								
BG								
CY		X					X	
CZ		X					X	
DE		X				X	X	X
DK		X					X	
EE								
EL		X		X		X		X
ES		X		X		X	X	
FI		X		X			X	X
FR		X		X	X		X	
HU								
IE								
IT		X		X	X		X	
LT								
LU		X					X	X
LV								
MT		X					X	
NL		X					X	
PL								
PT		X		X				
RO								
SE								
SI		X		X				
SK		X		X			X	
UK		X			X			
CH		X		X			X	
IS								

Legislation on PND use (IGES Institut, ITS Leeds, ETSC 2010)

Many countries have general articles in place stipulating that the vehicle windows/windscreen must allow a clear and undistorted view<sup>61</sup>. In some countries legal requirements have derived from these rather universal articles. Countries with rather specific legislation on PNDs include Spain and Luxembourg. In Luxembourg, legislation states that mounting any accessory devices such as PNDs is only allowed on the lower left side of the windscreen. In Spain, the Road Safety Law (Ley de Seguridad Vial) introduced in 2009 contains a specific article 65.4.g on the use of PNDs. It is prohibited to operate the device when the vehicle is moving and the device must be mounted where it can be easily seen by the driver without obstructing the field of view.

### 4.2.3 Consumer Information

National level governments could legislate for producers of mobile phones and PNDs to inform consumers about the risks of using them whilst driving. Moreover they could legislate that manufacturers of devices publish safety information for their customers on using PNDs especially adapted to their use whilst driving for work. Member States should also insist that producers should also include information on proper mounting for PND and include this information in the manual supplied with the PND. Some manufacturers are already doing this, this should be the norm.

### 4.3 Enforcement

Enforcement is a means to prevent collisions from happening by way of persuading drivers to comply with the safety rules. It is based on giving drivers the feeling that they run too high a risk of being caught when breaking the rules. Sustained intensive enforcement that is well explained and publicised also has a long-lasting effect on driver behaviour. The enforcement of nomadic device related legislation can be technically more difficult compared to other offences such as speeding for example. Visual or sound distraction is practically impossible to assess from outside the vehicle, while the miniaturisation of devices makes it difficult to visually detect if the device was used inside the moving car. The use of nomadic devices behind the wheel is nowadays exclusively subject to non-automated enforcement by police officers in vehicles, on motorbikes, or on the roadside. A driver can be stopped after committing an offence, where the offender receives immediate feedback and the police officer has the opportunity to explain why they are enforcing relevant legislation<sup>62</sup>.

60 IGES Institut, ITS Leeds, ETSC (2010): Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles. Study tendered by the European Commission, Berlin 2010.

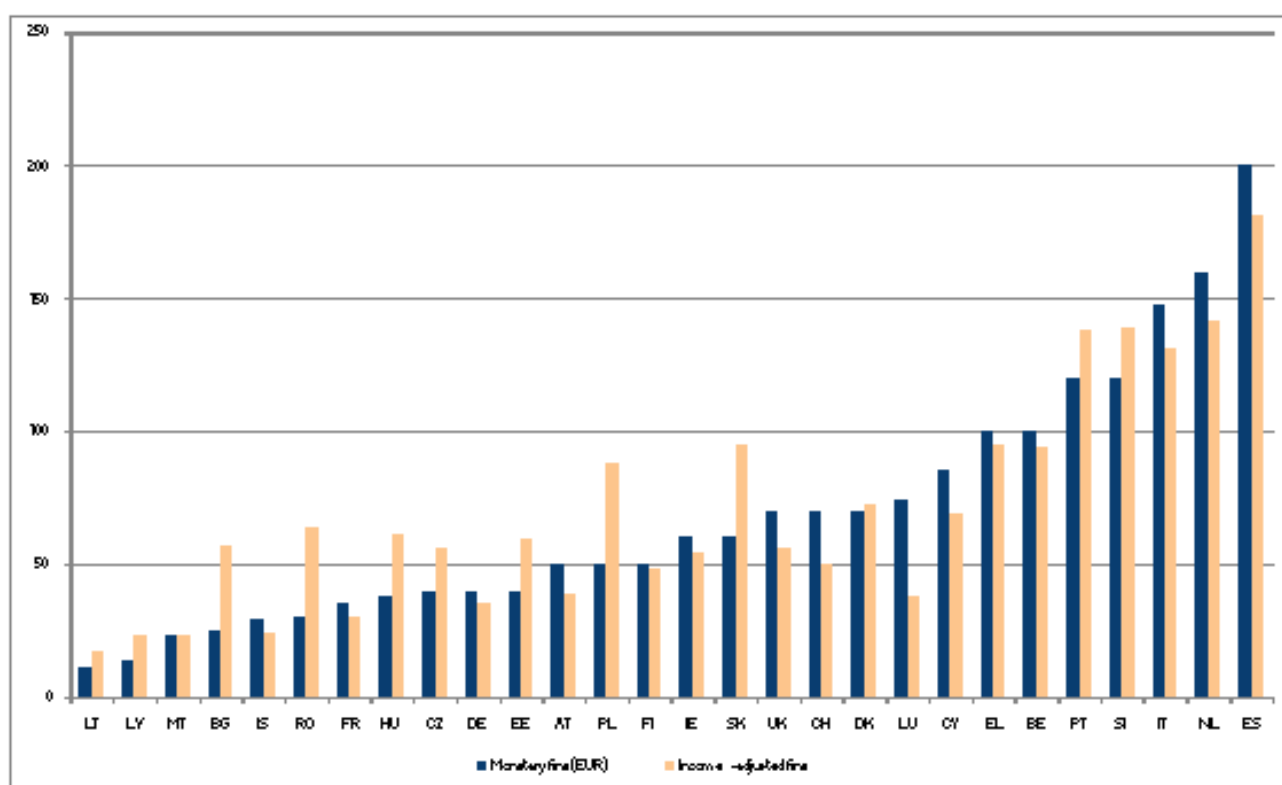
61 IGES Institut, ITS Leeds, ETSC (2010): Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles. Study tendered by the European Commission, Berlin 2010.

62 IGES Institut, ITS Leeds, ETSC (2010): Study on the regulatory situation in the Member States regarding brought-in (i.e. nomadic) devices and their use in vehicles. Study tendered by the European Commission, Berlin 2010.

According to a recent study<sup>63</sup>, legislation on the use of nomadic devices is enforced by national police forces in Member States with different intensity. In about half of countries, targeted checks are applied, meaning that the Police dedicate the full attention to the improper use of nomadic devices, typically of the mobile phone. This could take a form of a Mobile Phone Day of Action run in the UK, or specialised motorbike Police enforcement units operating in Austria. The broadest scope of checks in respect to the use of nomadic devices causing distraction is currently Spain. This is thanks to its most comprehensive legislation covering several different devices. In some countries such as Poland, or Portugal, Police report to perform both targeted and general checks of driving population. However, in about one third of countries, no specific targeted checks are performed (e.g. EL, IE, IT)<sup>64</sup>.

### 4.3.1 Sanctions

Research has also found that long-term behavioural effects from enforcement are only achieved if the detection of a violation is followed by immediate feedback or sanction<sup>65</sup>. It is however important that the level of sanctions is according to the risk related to non-compliance. This is also important to motivate police officers in their work, although research has found that higher sanctions have less of an impact on safety than the level of enforcement<sup>66</sup>. Monetary sanctions for using a mobile phone differ in the EU. The fine level varies from 11 EUR in Lithuania to 200 EUR in Spain. This table shows these values that can be interpreted as monetary fines with standardised capacity to pay. This table also shows that the adjusted fine levels in some Central and Eastern European countries are actually higher than the absolute fines.



Income-adjusted monetary fine levels for a mobile phone offence in Europe<sup>67</sup> (in EUR)

Although having general penalty point systems in place, several countries don't sanction mobile phone offences with penalty points. Where countries do have a penalty point system introduced that covers also mobile phone offences, the relative points for a mobile phone offence (i.e. percentage of points until licence withdrawal) vary between 6 per cent in Germany and 25 per cent in the

Czech Republic, Italy and the UK<sup>68</sup>.

### 4.3.2 Rehabilitation Courses

In some cases it has been found to be more effective to impose a remedial measure in combination with a

63 *ibid*

64 *ibid*

65 ESCAPE <http://virtual.vtt.fi/virtual/proj6/escape/deliver.htm>

66 SUNflower (2002): A comparative study of the development of road safety in Sweden, the United Kingdom and the Netherlands. Final report. Leidschendam.

67 [http://www.etsc.eu/documents/Report\\_Nomadic\\_Devices.pdf](http://www.etsc.eu/documents/Report_Nomadic_Devices.pdf)

68 [http://www.etsc.eu/documents/Report\\_Nomadic\\_Devices.pdf](http://www.etsc.eu/documents/Report_Nomadic_Devices.pdf)



sanction. So far most rehabilitation courses have either been general or specifically targeting drink drive or speeding offenders.

In the UK, three regions Hampshire, Thames Valley and Suffolk have begun offering driver rehabilitation courses for driver distraction and/or using a mobile phone while driving. The Call Divert Scheme in Thames Valley and Suffolk provides drivers with the opportunity to take part in an educational course instead of receiving a fixed penalty fine and points on their driving licence. "Call Divert" run by AA DriveTech typically targets drivers who were driving a motor vehicle, or supervising a provisional licence holder, while using a hand-held mobile phone or other interactive communication device. The Scheme aims to raise the awareness of the potential consequences of using a mobile phone while driving or supervising a provisional licence holder. The Course provides a framework for discussion and debate and explains, with examples, the UK law regarding using a hand-held mobile phone while driving or supervising a provisional licence holder. It shows how using a hands-free or hand-held phone while driving affects driving decisions and discusses the tragic consequences if it all goes wrong. Since the Call Divert Courses started in 1997, over 15,000 drivers have successfully completed the programme across the UK. Key to the success of the Course is an acceptance that the mobile phone is an integral part of life in general and work in particular but it is a major distraction while driving. Therefore, drivers need to be offered realistic, pragmatic and truly practical 'coping strategies' that empowers them not to make or receive any calls while driving.

In Germany, novice drivers who have been detected using a mobile phone while driving have to -beside paying a fine - attend a rehabilitation course and their probationary period is extended for additional six month.

#### 4.4 Road traffic death investigation establishing distraction

The use of nomadic devices, or distracted driving, are reported in police road traffic death investigation forms in a majority of Member States, but the level of detail and presumed underreporting make the data unreliable and incomparable between countries<sup>69</sup>. The elementary problem is the impossibility to verify whether the driver was using (improperly) a nomadic device at the crash event. An increasing practice is accessing mobile phone records and

linking this with the time of the collision to establish if the driver was distracted prior or during the collision. The UK's ACPO "Road Death Investigation Manual"<sup>70</sup> includes mobile phone use as one of the possible sources for distraction causing dangerous driving. It is included as one of the contributing or precipitating factors in the template used for road traffic death investigation.

#### 4.5 Driver Training

Driving schools could play a primary role in providing necessary information on the risk of distracted driving. Beyond the initial driver training, governments could also insist that driver education programmes include distracted driving in driver training (including for professional drivers) such as the new Directive 3003/59 see PRAISE Report on Driver Risk Assessment and Training<sup>71</sup>. Also that special programmes and initiatives run by employers and insurance companies cover distracted driving risks. In some EU Member States such as Germany and Italy drivers who have lost their driving licences due to a driving ban must complete a general rehabilitation training programme including different topics on road safety, this should also include the risks of distracted driving and tools to manage communication.

#### 4.6 Public Procurement

Governments can bring about change by setting an example. They can influence demand through their own public procurement policies. All non-private customers, such as governmental bodies, local authorities and companies can play an important role by including specific requirements on minimum safety levels in their in-vehicle technology purchase policies. In this case they could only purchase PNDs which has high safety standards and features. Also when they area subcontracting out their services they could only do so to transport providers who also have a mobile phone and PND policy restricting or banning use for safety reasons.

#### 4.7 US Government Bans Texting by Employees

In October 2009, the US Federal Government demonstrated leadership in reducing the dangers of text messaging while driving for its near 3 million civilian employees when President Barack Obama issued an Executive Order using his presidential prerogative to prohibit the use of text messaging while driving on

69 [http://www.etsc.eu/documents/Report\\_Nomadic\\_Devices.pdf](http://www.etsc.eu/documents/Report_Nomadic_Devices.pdf)

70 [http://www.acpo.police.uk/asp/policies/Data/road\\_death\\_investigation\\_manual\\_18x12x07.pdf](http://www.acpo.police.uk/asp/policies/Data/road_death_investigation_manual_18x12x07.pdf)

71 <http://www.etsc.eu/documents/PRAISE%20Report%202.pdf>

72 [http://www.whitehouse.gov/the\\_press\\_office/Executive-Order-Federal-Leadership-on-Reducing-Text-Messaging-while-Driving/](http://www.whitehouse.gov/the_press_office/Executive-Order-Federal-Leadership-on-Reducing-Text-Messaging-while-Driving/)

official business or while using Government-supplied equipment<sup>72</sup>. Every day, Federal employees drive on official Government business, and some Federal employees use Government-supplied electronic devices to text or e-mail while driving. Extending this policy to cover Federal contractors is designed to promote economy and efficiency in Federal procurement. Federal employees, Government Contractors, Subcontractors, and Recipients and Subrecipients shall not engage in text messaging (a) when driving government or privately owned vehicles while on official Government business, or (b) when using electronic equipment supplied by the Government while driving. All government agencies were asked to take appropriate action within the scope of their existing programs. This included, considering new rules and programs, and re-evaluating existing programs to prohibit text messaging while driving, and conducting education, awareness, and other outreach for Federal employees about the safety risks associated with texting while driving. These initiatives should encourage voluntary compliance with the agency's text messaging policy while off duty.

#### 4.8 Recommendations to EU Member States

- Run regular targeted information campaigns for those driving for work linked to enforcement on the risks of using a mobile phone or PND while driving.
- Adopt clear and strict legislation banning the use of mobile phones, including hands free, whilst driving.
- Adopt legislation restricting the use of PND whilst the vehicle is moving.
- Inform employers of legal situation in different EU MSs.
- Promote the business case to employers and link financial and non-financial sanctions to risk associated with offence.
- Communicate the legal restrictions for using a mobile phone and PNDs to citizens and target employers as a specific group.
- Include distraction by use of mobile phone or other PND device in road traffic death investigation by statutory bodies and communicate this to the public guidelines.

- Include driver distraction policy requirements in public procurement.
- Integrate distracted driving into driver training [citizen and professional] and education including driver rehabilitation courses.
- Integrate distracted driving into training and education for transport managers.
- Mandate safety information (including mounting PND information) to consumers by manufacturers of PNDs and mobile phones.

### 5 European level: what can the EU do?

#### 5.1 Information, Training and Enforcement

Following on from the overview of what is being undertaken at a national level the EU can certainly fulfill a number of different roles. One is a very simple one of information. It could communicate to employers and citizens the different legal requirements on mobile phone use and the use of PNDs. There is also a need for more information on their use and the impact on road safety so the EU could also invest in research and surveying this use and associated risks in the EU. According to the IGES<sup>73</sup> Report, better data is needed to more accurately characterize and quantify the problem. The report showed that several EU countries do not carry out regular programmes to monitor the prevalence of mobile phone or other nomadic device use whilst driving. In many EU countries, there is currently a lack of data on the extent to which driver distraction due to the use of nomadic devices is a contributory factor in road traffic deaths. Even if data are recorded, differences in road traffic death reporting and data collection make it difficult to compare data between EU countries.

##### 5.1.1 Enforcement

Within the EU's new "Road Safety Policy Orientations" under Objective 2 on enforcement the European Commission stressed the need to increase coordination and sharing of best practice to help make enforcement and controls more efficient. They also stressed the importance of linking enforcement to user information and supporting information actions

73 [http://www.etsc.eu/documents/Report\\_Nomadic\\_Devices.pdf](http://www.etsc.eu/documents/Report_Nomadic_Devices.pdf)

and awareness raising. The Commission will also prepare a common road safety enforcement strategy. They could also integrate the need to enforce sources of distractions including mobile phone and PND use in this strategy and include it as a point for Police forces in the different Member States to exchange best practice on. Moreover with the upcoming Directive on Cross Border Enforcement of road safety related traffic offences use of mobile phones should also be included in the priority list of sanctions.

Occupational Safety enforcement bodies also have a role to play in enforcing statutory provisions with employers. Work related road safety risks need to be prioritised by EU and information provided to empower employers to act more responsibly and exercise their duty of care to those employees who drive for work, including managing in vehicle distraction risks.

### 5.1.2 Driver training

As mentioned above the risks of distraction from mobile phones and PNDs should be integrated into citizen and professional driver training. As the European Commission is due to review both the Driving Licence Directive (2006/126) and the Directive on Initial Qualification and Periodic Driver Training of drivers of certain vehicles (2003/59) in the near future they could also look to see how these could be included in the curricula.

### 5.2 Driving for Work Road Safety Policy

The EU is in the process of developing its driving for work road safety policy. Although driving for work road safety was not included in the EU's "Road Safety Policy Orientations" as such, the European Commission does include integrating road safety into other policies including employment. The EU's Transport Ministers also identified at the Transport Council in December 2010 that employers should be encouraged to adopt road safety action plans<sup>74</sup>. Moreover, within the field of employment policy the EU also adopted "Improving Quality and Productivity at work: Community Strategy 2007-2012 on Health and Safety at work". Although driving for work is not included there is the possibility that specific measures focusing on reducing death and injury whilst driving for work could be included in the next Community Health and Safety at Work Strategy. The need to address the risks of distracted driving should also be included in the development of the EU's driving for work road safety policy.

### 5.3 Consumer Policy

Within the context of the EU's consumer policy there is also a Directive 97/55 EC on misleading advertising. The EU should also encourage Member States when implementing this Directive to make sure that there is no misleading information as regards the safe use of mobile phones and accompanying equipment for hands free and PNDs.

### 5.4 EU ITS Action Plan and Directive

The EU ITS action plan and Directive lay down the framework for the implementation of ITS stressing that they can contribute to making transport safer, more efficient and competitive, more sustainable and more secure. Actions also of relevance to this PRAISE report include technologies such as driver assistance and calculation of itineraries. The development of PNDs attached services and their placement in vehicles will be influenced by these new actions. The ITS Directive states that specifications and standards for an optimal use of road, traffic and travel data should include multimodal and real-time traffic information. Both are important for the development of PNDs. Specifications will also be developed for the collection of this data by relevant public authorities and/or private sector. Specifications are foreseen for the definition of the necessary requirements to make road, traffic and transport services data used for digital maps accurate and available to digital map producers and service providers. Especially of relevance is that the definition of minimum requirements for road safety related 'universal traffic information' are provided, where possible, free of charge to all users. The year 2013 will see the adoption of specifications for real-time traffic information systems and for systems to reserve available parking lots.

In the ITS Action Plan the definition of the on-board Human-Machine-Interface and the use of nomadic devices to support the driving or transport operation as well as the security of the in-vehicle communications will also be covered (priority area III). This will be built upon on the European Statement of Principle on safe and efficient in-vehicle information and communication systems. The development of consumer information on nomadic devices could also be considered. In particular setting up a scoring system based on safety performance such as EuroNCAP. The HASTE project was close to developing such a scoring system<sup>75</sup>.

74 [http://ec.europa.eu/danmark/documents/alle\\_emner/transport/101202\\_raadet\\_en.pdf](http://ec.europa.eu/danmark/documents/alle_emner/transport/101202_raadet_en.pdf)  
75 HASTE Project Deliverables <http://www.its.leeds.ac.uk/projects/haste/deliverable.htm>

## 5.5 Support for Research and Development of Nomadic Devices

The European Commission is supporting the research and development of nomadic devices including the safety aspects. There are currently a number of projects underway whose research outcomes will be important in informing next steps.

### 5.5.1 Project Interaction

Interaction is focusing on understanding driver interactions with In-Vehicle Technologies<sup>76</sup>. The project aims to collate knowledge that will enable the definition of actions to strengthen drivers' awareness on the use of these technologies and for the consequences that such use has or may have. The project will also come up with recommendations for the design of future systems and of appropriate instructions for drivers that will use them to favour a safe use of In-Vehicle Technologies by European drivers.

### 5.5.2 Support of Field Operational Trials of ICT

The European Commission is also supporting FOT-NET<sup>77</sup>: Networking for Field Operational Trials. This is a large scale test programme aimed at providing a comprehensive assessment of the efficiency, quality, robustness and acceptance of ICT solutions for transport. The FOTs try to understand important questions such as: how the driver uses the system, what the short and long term effects and how can the systems' performance be improved. A common European FOT methodology has been developed and the GESTA project also funded by the European Commission has developed a handbook on FOT methodology.

## 5.6 Recommendations to the EU

Support awareness information campaigns on the risks of distracted driving.

Ensure broad information to EU employers and citizens about the legal overview of use of mobile phones and PNDs in the different EU Member States for example by publishing this information on their website.

Assess the possibility to develop guidelines on how the usage of mobile phones in road traffic should be assessed. The methodology developed in the area of seat belt use within the 6th FP project SafetyNet could serve as a template for this.

With regards to road traffic death investigation, develop methods to enable better assessment of the role of distraction in road traffic deaths, including a review of existing reporting systems. Road traffic death data systems on nomadic device use should be improved, including type of device and the context in which it was being used when the crash occurred.

Undertake a survey of the use of PNDs in the "driving for work" context.

Include mobile phone and PNDs in the upcoming road safety enforcement strategy, Cross Border Enforcement Directive and facilitate exchange of best practice on enforcement between the different police forces.

Include managing risks associated with mobile phone use and other PNDs in driver training.

Include the risks of mobile phone and PND use in the EU's driving for work road safety strategy.

Ensure that the Directive on misleading advertising is respected as regards mobile phones and PNDs.

Continue to support the field operational trials of mobile phone and PND technology and apply lessons learnt to address risks and benefit from safety services.

Support the research and development of PNDs and their services to support safety applications as a matter of priority.

Develop consumer information on nomadic devices including setting up a scoring system based on safety performance such as EuroNCAP.

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<sup>76</sup> <http://interaction-fp7.eu/>

<sup>77</sup> [http://www.fot-net.eu/en/about\\_fot-net/about\\_fot-net.htm](http://www.fot-net.eu/en/about_fot-net/about_fot-net.htm)

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# “PRAISE”: Preventing Road Accidents and Injuries for the Safety of Employees

JANUARY  
**2011**

FACT SHEET  
**5**



Interview with John Klee,  
Corporate Communica-  
tions Manager, 3M

ETSC’s PRAISE project, “Preventing Road Accidents and Injuries for the Safety of Employees” aims at mobilising knowledge needed to create work-related road safety leadership. This Fact Sheet complements the PRAISE Report Minimising In-Vehicle Distraction. 3M introduced the ban of mobile phones including the hands free option, as company policy. We interview the corporate communications manager to understand how this policy was introduced and the effects it has had also how this fits into 3M’s broader road safety commitments.

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## Road Safety Management at 3M

### 1. Can you provide any figures tracking your safety performance over the years?

We have around 800 company car drivers and the most common incidents involve drivers hitting a static object, such as a bollard or a wall. The most common accident involving another vehicle is one of our drivers being hit in the rear by another car – we had 20 or so of those in 2009. Accidents requiring employees to take time off work are thankfully infrequent, at around four per year, but we obviously want to get that down to zero if we possibly can.



### 2. How are transport safety decisions taken at 3M?

We have a Fleet Steering Committee, which operates throughout the year but only meets formally every six months. This team deals with all aspects of managing our fleet, from agreeing which cars are made available, through to emissions policies and safety considerations. It has a core membership made up of senior managers representing human resources, finance, functional units and customer-facing businesses and calls on our insurance and safety experts for specific topics.

### 3. Do you think that companies who have employees on the roads have a duty to go beyond the legislation regarding traffic safety of the country in which they operate?



At 3M we always strive to do business 'in the right way'. I think it is fair to say that we take legislation as a starting point and aim to go beyond mere compliance. For example, in the UK it is perfectly legal to use a hands-free phone

while driving – but we have banned it for our employees. It is legal but it is dangerous – and we don't want our employees to be a danger to either themselves or other road users.

### 4. What would you say are the main drives for your company's efforts in road safety?

As a bare minimum, we have a responsibility to ensure our employees get through the day safely, fit and well. To that end, all our employees know the company would not want them to take unnecessary risks whether they are in their workplace or on the move. We can't sit alongside them while they're driving – but our people do know that we want them to behave responsibly in everything they do.

That general mindset is important – it is clear, simple, easy to understand – and while people might 'forget' a policy, they can't forget that you want them to get home safely to their families at the end of the day.

## 3M's Mobile Phone Policy

### 1. What are the main elements of your company's mobile phone policy?

There's really only one element – don't use a mobile phone while you are driving. Even if our employees are in their private car and using their personal mobile phone, they are not allowed to make or receive business calls unless they are parked up safely with the handbrake on.

### 2. When did you start looking at this problem, and what motivated you to start?

The UK Government introduced new legislation – the Corporate Manslaughter and Corporate Homicide Act in 2007. This allowed for companies and organisations to be found guilty of corporate manslaughter as a result of serious management failures resulting in a gross breach of a duty of care.

In common with most businesses, this prompted us to review all relevant company policies. It was as part of this process that we became aware of research which showed that drivers were four times more likely to have a crash when using a mobile phone when driving. The research showed conclusively that phone conversations are a distraction for drivers – and that goes for hands-free calls, too.

### 3. Did you contact any organisation/road safety experts to help you prepare your policy?

We have been a long term supporter of Brake, the road safety charity here in the UK and they were hugely supportive of us for the stance we took. TRL, the UK's leading Transport Research Laboratory, which is located just a few miles from our UK Head Office,

also shared findings from their own research, which we have used to reinforce the need for this policy with our employees.

They didn't help us with the preparation of the policy – but they did provide us with important research data which helped us to explain the reasons for the ban in our communications to employees.

**4. How do you enforce your policy to ensure drivers do not use their mobile phones?**

3M employees are intelligent adults and our culture encourages independent thinking and taking personal responsibility. The vast majority are first class 'corporate citizens' and will adhere to company rules, but our aim from the outset was to educate them on the dangers presented by the distraction of having a phone conversation while driving - and for them not to want to make or receive calls while on the road.



This wouldn't work for every organisation – it depends on individual corporate cultures – but our preferred approach is to focus on education rather than disciplinary proceedings.

**5. What is the procedure if you identify a driver who is using his/her mobile phone?**

You occasionally hear a colleague talking on the phone in the office and it is evident that the person they are calling is driving. They get off the phone as soon as they can and say: "Call me back when you're not driving and it is safe". There will then often be some office chat about why the driver had even answered the call if he/she was driving at the time. For many employees, making a call while driving has become as socially unacceptable as drinking and driving – it is recognised as being dangerous and not tolerated.

Of course, as with all policies, disciplinary procedures are an option for persistent offenders who willfully break the rules, despite understanding the risks associated with their actions.

**6. How many such cases have you had?**

No-one has been put through disciplinary procedures on this issue. I have no doubt that there will be some people

who don't agree with the ban or dislike it, as it impacts on the way they have become used to doing business, but that's not the issue.

For people who might want to challenge the ban I have always had the option of asking Brake to send us one of their volunteers – maybe a parent whose child has been killed by a driver who was talking on the phone at the time. We haven't had to do that yet, but it would put the message across more forcefully than disciplinary procedures ever could.

**7. What has been the opinion of employees, are they supportive? Did you consult with them?**

We didn't consult them about the policy – once we understood the risks there wasn't really anything that anyone could have said to convince us to allow such an unsafe practice to continue. However, I did consult with some members of our sales force about the communication of the policy. I invited them to a meeting, told them what we were about to announce, and asked for their reaction. I felt that would help me to decide how best to position the ban. The first reaction surprised me, though. One of our guys just said: "Good - and about time, too. We all know it's dangerous and it should have been banned long ago." It became apparent that several of them had assumed that they were required to stay in contact all the time. For them, there was a sense of relief that the company was making it clear that it did not want them to act in any way that could cause harm either to themselves or other road users.

For others, though, the reaction was more in line with what I expected: "This is going to make my job much harder." They were not happy and I respect the sincerity of the views they expressed - but we weren't really going to say: "OK, you might kill someone in the process, but carry on regardless."

Also, when we talked to our people about the types of calls they were making when driving, they were generally catch-up calls. You can't conduct a detailed price negotiation while you're driving, for example, and we found that the vast majority of calls were not business critical. The challenge is for people to plan their days and their journeys so they can stop safely at regular intervals to make and receive calls.

That said, we started getting feedback to say many were becoming frustrated to find that, by the time they had stopped to return people's calls, the callers were themselves unavailable and that an unreward

ing game of ‘telephone tag’ then ensued, with both parties returning calls but being forced to leave messages. Our sales force has now been equipped with Smartphones, so if the person they are calling is not available, they can drop them an email and deal with the enquiry in that way. We have been monitoring employees’ views since the ban was introduced in 2008. The most recent survey, conducted in June 2010, showed that 42 per cent felt positive about the ban – well ahead of the 19 per cent approval when the ban was first introduced. 37 per cent said they felt negatively about the ban – which is a lot better than the 56 per cent opposition in 2008.

**8. What have been the lessons learnt and what would be your main advice to other companies?**

We don’t think it’s 3M’s place to tell other organisations how to go about their business, but we are very happy to share our experience. We are a Business Champion for the Driving for Better Business campaign, which is supported by the UK Government, and we have spoken to many companies who want to understand how we implemented our ban.



As I say, though, every organisation is different and the approach to introducing such a ban has to be tailored to individual organisations’ cultures. I know of one company where check calls are made to drivers periodically. If they answer and it is clear they are driving, they are disciplined. That’s the right approach for that company – but it wouldn’t be the way for 3M.

**9. How did you come to the conclusion that also the use of hands free systems was an important risk factor?**

People know that hand-held calls while driving are dangerous. Most of us have experienced vehicles being driven erratically while the driver struggles to indicate, turn the steering wheel and hold a phone at the same time, so everyone understand why that has been made illegal. However, there is compelling evidence that having a hands-free phone conversation can also have a significant negative impact on driving performance. It is the conversation that causes the distraction, as the driver focuses on what is being said rather than focusing on the road and what other vehicles are doing.

1,600 of our customers took part in a survey we ran in 2009 and 30 per cent of them admitted to having missed a turning while conducting a hands-free phone conversation. I think it’s fair to say that would have been

because they were distracted. Worryingly, that figure rose to 52 per cent amongst sales people who were on the road 3 days or more every week.

It was a fascinating piece of research. It showed that 44 per cent of respondents felt the roads would be safer if the practice was banned by law – but that only 22 per cent thought it should be – and that figure dropped to 10 per cent amongst sales people. If that seems illogical, the reason became clear later in the survey. 59 per cent felt such a ban would have a negative impact on their work – and this rose to 82 per cent amongst sales people.

I think this is a topic that people understand on an intellectual level – but there is still a strong emotional response, as we have all become so used to being available constantly.

**10. Would you like to see further steps from the government in terms of mobile phone use regulation and sanctions while driving?**

I understand that the government would only want to introduce legislation that can be implemented effectively. It is fairly straightforward for the police to see that a driver is holding a mobile phone to his or her ear, so the law against hand-held call while driving can be enforced.

However, it must be much more difficult to provide evidence to prosecute hands-free offences. Drivers could be talking to other passengers in the car or even singing along to a song on the radio. I guess someone has to look at the balance between front line policing and the resources that would be required to marry call records precisely with the time of alleged offences in order to secure successful prosecutions.

**The Business Case**

**1. Have you calculated or do you have an idea of the financial benefits that have or will result from your road safety policies in terms of avoidance of collisions?**

This was a preventative measure taken in the light of an identified risk. It wasn’t a matter of us experiencing crashes due to people making hands free calls while driving – so we don’t have ‘before’ and ‘after’ statistics. In any case, the business case here is a moral one rather than financial. Knowingly putting our employees and other road users at risk isn’t something we would do.

**2. Do you feel that your customers are reassured by knowing that you have strong safety standards? How do you communicate that to your customers?**

I think that in all lines of business customers do take note of how organisations treat their employees. If a supplier doesn't treat its employees well, it is difficult for its customers to feel confident that they will be treated any differently. 3M has a proud reputation for doing business 'in the right way' and I think there are brand benefits to be had from being seen to take our employees' well-being so seriously.

I think our customers recognise that introducing such a ban could not have been an easy decision and hope that they respect the sincerity of our intent and our commitment – and feel confident that we will treat them with equal care.

**3. How do you feel that you perform compared to competitors in terms of road safety?**

This is sometimes cited as a source of frustration for some of our drivers, as they fear that we may be putting ourselves at a competitive disadvantage by taking health and safety so seriously. Although they understand the reasoning behind the mobile phone ban, it's not easy for them to think that competitors who take a more relaxed view on safety are able to make and take calls.

We can't let such thinking push safety down our agenda, though. The challenge instead is to make ourselves more accessible in other ways, such as providing land line numbers for customers to call when our people are driving.

**4. Will 3M consider applying for the upcoming ISO 39001 standard on road safety management when it becomes available?**

I think this is unlikely, as this doesn't represent a core part of our business.

**Other areas of 3M's Road Safety Policy**

**1. What are the other main elements of your internal road safety policy/strategy?**

We have a very strong health and safety culture and our

sites are recognised every time they pass a million hours without a 'lost time' accident. If, in one of our plants, a practice was identified that increased the risk of an accident by a factor of four, steps would unquestionably be taken to mitigate that risk. With the car being an extension of the workplace, the same thinking applies.

That's the general background – in addition our company car drivers are required to attend a Defensive Driving Course every four years. It is easy to slip into bad habits, so the occasional refresher, which includes both 1:1 classroom activity and on the road assessment, is a great way to keep safety front of mind.

**2. Do you have a way of controlling your employees' speed on the roads?**

No – they are required to operate within the laws of the land.

**3. Do you have a way of ensuring your employees wear their seat belts?**

No – this is a legal requirement and they are required to meet all legal requirements.

**4. What do you do in the field of drink driving, how do you ensure your employees do not drink and drive?**

Our drivers are encouraged to follow a no-alcohol policy and, in any case (and at the risk of sounding repetitive), they have to operate within the law.

**5. Are there other forms of driver distractions that you are aware of (other than mobile phone use) and address in your policies?**

Yes – we tell our employees not to eat or drink while driving and company car drivers are not allowed to smoke, either.

**6. Do you explain to your drivers the importance of being fit to drive (healthy lifestyle, healthy diet, enough sleep, etc.)?**

Yes, as this is an area we cover in our 3M Drivers'

Guide – a handbook that is issued to all company car drivers. Our employees are encouraged to plan their days in advance and to punctuate longer journeys with a 15 minute break every two hours. They are also asked to consider the impact issues such as the weather, road conditions, personal fitness, the effects of medication, etc. could have on their driving performance.

### **7. Are there any other areas that you would like to mention?**

A number of companies have talked to us about our ban as they consider introducing one of their own. They all know that it is a difficult decision to make, as there are natural concerns about productivity and the potential impact on business. We tell them that it could have been a difficult decision for us to make, too – but in the end, it wasn't. Simply, if you have a sincere health and safety culture, you cannot be presented with a hazard that increases the risk of an accident by a factor of four and ignore it.

### **Short bio**

John Klee is corporate communications manager for 3M in the UK and Ireland. He is responsible for both employee and external communications at the diversified technology company. With a 'hearts and minds' approach being taken to the 3M's mobile ban, John plays a leading role in ensuring employees understand the dangers of talking on the phone while driving.

### **About 3M**

3M is a \$23 billion diversified technology company which, since 1902, has been creating innovative products that help make the world healthier, safer and more productive. Well known 3M brands include Scotch, Post-it, Scotchgard, Thinsulate and Scotch-Brite.

3M employs some 75,000 people worldwide and has operations in more than 65 countries. It produces tens of thousands of innovative products for customers in dozens of diverse markets and its 40+ technology platforms touch nearly every aspect of modern life.

3M innovation plays a major role in road safety. Its materials are used in license plates, road signs and road markings, enabling drivers to see them sooner and react more quickly, helping to avoid accidents. 3M also provides conspicuity tape to make vehicles more clearly visible, as well as driver feedback signs that display the speed of passing motorists.

The UK and Ireland is home to one of the largest 3M subsidiaries outside the USA, employing more than 3,500 people across 17 locations, including 10 manufacturing sites.

Products manufactured in the UK include coated abrasives, occupational health and environmental safety equipment, adhesive tapes, industrial microbiology products, drug delivery systems, high-performance coatings, secure documents and passport scanners.

[www.3M.com](http://www.3M.com)







# “PRAISE”: Preventing Road Accidents and Injuries for the Safety of Employees

MAY

2011

REPORT

6

## Road Safety at Work Zones

### ETSC PRAISE Project

PRAISE is a project, co-funded by the European Commission and implemented by ETSC, which focuses on Preventing Road Accidents and Injuries for the Safety of Employees (PRAISE). The project aims to advance work-related Road Safety Management and provide the know-how to employers who have to take on that challenge. It also aims to present the work-related road safety standards of EU Member States and carry out advocacy work at the EU level: work-related road safety is an area of road safety policy that clearly needs renewed political commitment.

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## Part 1: State of Play

### 1.1 Introduction

The focus of this thematic report is improving safety for both employees and road users in relation to work zone areas on and adjacent to roads. The road work zone (RWZ) is defined as the part of a road facility influenced by works occurring on or near it. The report sets the context by outlining the nature and scope of the problem of road safety at road related work zones including identification of the most significant risk factors and causes of collisions and incidents. The Report then takes a specific look at the various stages involved in working on or near roads namely planning, operation, installation and removal of the works. At each stage key issues in terms of safety are identified and discussed. Subsequently good practice solutions or approaches in terms of RWZ safety have been identified and recommendations for the EU, National governments and Employers in terms of contributing to improved worker safety are suggested. This topic is pertinent across all Member States where increasing road traffic puts added pressure on road infrastructure potentially increasing the incidence of maintenance works required and, specifically for new Member States, where new and replacement roads are being planned.

There are a range of employees whose place of work is the road way or road side and who are exposed to significant risk as a direct result of this. This group includes not only those engaged in road construction and/or renewal but also those working in road maintenance, utilities management (electricity, communications, water, and gas), service maintenance (drains, tree and verge cutting) and traffic management. In the broader context the report offers principles that should apply to all people working on or near the road and also needs to consider third parties, not only those in their vehicles (cars, trucks, buses and motorcycles) but also cyclists and pedestrians, as the most vulnerable road users, and persons living in the surroundings of the road.

This report focuses on the specific risks at RWZs that are the result of the competition between workers and normal road users for the limited space available. However, the issue of safety is interrelated with broader health impacts and risks. The nature of the majority of road related works activities and the

characteristics of their location pose increased risks to workers for example in terms of the negative impact of prolonged exposure to weather (e.g. sun or cold exposure), traffic noise and fumes or the physical strain of repeatedly operating machinery or dealing with heavy loads. Road workers can also be exposed to increased stress as a result of negative reactions from other road users. Such exposure can impact on the level of safety afforded to road workers at any given time and approaches to ensuring the health and safety of road workers should be considered in an integrated manner.

There is debate and uncertainty surrounding the scale of the problem which is difficult to gauge due to lack of specific data collection in relation to RWZ related collisions. However there is a general consensus and recognition of the higher risk exposure associated with road side working as opposed to other occupations. In this context there is also acceptance of the fact that deaths and serious injury at or adjacent to RWZs are a major social issue and efforts are needed to reduce them as much as possible.

The level of risk will depend on the type of works to be carried out, the duration and the location – classification of the road and volumes of traffic. It is important to recognise that there are crucial differences between road types (rural, urban and motorway) that require varying approaches in terms of safety provision. Similarly, the type of road work will influence the safety measures and approach that best fits i.e. whether the works are mobile, short, medium or long term.

The type of the work zone in terms of function, area and duration can vary greatly as can the type of work being progressed and the environment in which the work zone is located. In turn, these variations impact on the type and nature of risk present and on the steps that can be taken to minimise this risk. Different work zone types also present different driving conditions to other road users which have implications for safety and are a critical consideration when planning and operating the work zone.

## 1.2 Defining the Environment: Types of Work Zone, Types of Roads

The ARROWS<sup>1</sup> and PREVENT<sup>2</sup> Handbooks defined three categories of work zone types (based on duration of works) as common in most countries namely Long-term, Short-term stationary and Mobile. Long-term referred to works staying in place at least overnight, short-term to works staying in place for at least half a day but no more than one day and mobile referring to works that travel. Since publication of these reports a more common four category definition of work zone types has become generally accepted in the industry as follows:

- Long-term stationary work is defined as construction or maintenance work that occurs in a single location with duration of more than three days.
- Intermediate-term stationary work occurs in a single location for more than one daylight period (up to three days) or night-time work lasting more than one hour.
- Short-term stationary work is construction or maintenance work that lasts for more than one hour, but is completed within a single daylight period.
- Mobile work is construction or maintenance work that moves intermittently or continuously

These Handbooks also underlined that, while there are variations in the duration of road works, there are also variations in the types of roads on which they take place and the interactions between these two variables set the context for the design of the road work, the impact on other road users and the risk to safety. The ARROWS project defined five categories of road type as follows:

- Motorway and dual carriageway

- Rural primary
- Rural secondary
- Urban main
- Urban local<sup>3</sup>

In general, varying national definitions of road classes can be adequately accommodated under this broad classification of road types<sup>4</sup>.

The various road types and work zone types interact to produce dynamic environments which are made increasingly complex with the introduction of workers, road users and changing weather and local environment. This serves to highlight the fact that in many ways each road work scenario is unique – it will have unique characteristics working together with the potential to create risk and means that a ‘one size fits all’ approach to providing for safety is not appropriate. The dynamic nature of works in or adjacent to roads needs to be remembered by all those involved in their design, management and use.

In the context of the above it is clear that issues relating to safety will also vary from work zone to work zone and that individual risk assessments which allow for the identification of location specific risks will be required in order to develop a comprehensive approach to providing effective safety measures. However, the difficulties in dealing with ever unique situations can be lessened with the identification of high-level safety principles, aimed at improving safety, to be applied at all stages of road works from planning through to removal. Such principles will ensure that achieving a high level of safety is then inherent in all decisions taken in terms of safety measures, work zone design and operation.

1 <http://www.ntua.gr/arrows/finalhb6a2.pdf> ARROWS was a European Commission funded research project aimed at improving the safety of road users and workers at RWZs. Its main output was a Handbook intended for highway authorities, designers, contractors and other individuals and organisations responsible for traffic safety at roadworks

2 <http://www.hit.certh.gr/prevent/media/Deliverables/Handbook.pdf> Building on the findings of ARROWS the PREVENT project (also funded by the EC) developed an educational programme aimed at improving traffic behaviour at road works and training schemes for highway repair and maintenance worker personnel, and driving instructors.

3 <http://www.ntua.gr/arrows/finalhb6a2.pdf>

4 Ibid

## 1.3 Scope

A significant amount of research has been carried out in Europe and further afield which highlights the fact that work on or near roads results in increased risk for both workers and road users. However, the majority of this research has been piecemeal focusing on single countries or specific types of roads and concentrating on single issues such as road worker deaths or occupational health. As such, it is difficult to gain a holistic view of

### 1.3.1 Risk to road workers

In terms of risk faced by road workers a recent study in the Netherlands (2006–2007) estimated from data on fatal crashes that the risk facing road workers is significantly higher than that faced by general construction workers<sup>6</sup>. Similarly in the UK it is noted that the average death rate for road workers continues to be one of the highest for employment

### 1.3.2 Risk to road users

An international review on collision studies carried out as part of the European project ARROWS 'revealed that work zone areas have, typically, higher (road traffic) collision rates in comparison with equivalent non-works sections'<sup>9</sup>. In Austria, yearly about 120 collisions and 4 deaths occur at roadwork zones on national roads. Currently the proportion of road construction related collisions compared to all road collisions is approximately 4%<sup>10</sup>. Studies in Finland and Slovenia showed that 'motorists are up to five times as likely to get hurt when travelling through a work zone'<sup>11</sup> while in Germany research has shown that approximately one quarter of collisions happening on national routes occur at work zones. One exception is a study carried out on behalf of the UK Highways Agency that reviewed the safety performance of traffic management at major road works – the fourth such study over the period from 1992<sup>12</sup>. The study showed 'no significant difference in the rate of Personal Injury Accidents (PIA) when road works were present on the motorway.' When

the true scale of road work related incidents. Despite this, the existing research serves to underline that there are significant safety issues surrounding road works which have the potential to result in negative human, economic and social consequences. Moreover, the European Commission adopted a new target to reduce road traffic deaths by 50% by 2020 in its new "Road Safety Policy Orientations 2011-2020"<sup>5</sup>.

sectors reported by the Health and Safety Executive<sup>7</sup>.

A survey released by the UK Highways Agency in 2006 suggested that 'up to 20% of road workers had suffered some injury caused by passing vehicles in the course of their careers and 54% had experienced a near miss with a vehicle'<sup>8</sup>.

compared with the 1992 results the 'with' works accident rate had reduced from 0.174 to 0.101, the same as the national average PIA. 'The conclusion of this study is that due to the increased number of safety measures and practices over the past decade, the risk (in terms of Personal Injury Accidents) when road works are present is similar to the risk when no road works are present.'<sup>13</sup>

One of the limitations currently encountered while assessing safety in RWZs is that little detailed information exists about the change in collision risk and costs associated with works activities. Whilst many countries routinely collect information on the number of collisions at works these do not in general allow an estimation of the increased risk. Research to date is limited but demonstrates firstly that the presence of work zones increases risk on the roads, secondly, that working on the roads is one of the most dangerous occupations and thirdly, that improved safety practices can reverse these scenarios.

5 [http://ec.europa.eu/transport/road\\_safety/pdf/com\\_20072010\\_en.pdf](http://ec.europa.eu/transport/road_safety/pdf/com_20072010_en.pdf)

6 [http://www.virtualriskmanager.net/main/aboutus/niosh/poster\\_venema-anita\\_1.pdf](http://www.virtualriskmanager.net/main/aboutus/niosh/poster_venema-anita_1.pdf)

7 [http://www.highways.gov.uk/knowledge/documents/Road\\_worker\\_Safety\\_Strategy.pdf](http://www.highways.gov.uk/knowledge/documents/Road_worker_Safety_Strategy.pdf)

8 [http://www.highways.gov.uk/knowledge/documents/Roadworkers\\_Safety\\_Report\\_Phase\\_One\\_Final.pdf](http://www.highways.gov.uk/knowledge/documents/Roadworkers_Safety_Report_Phase_One_Final.pdf)

9 <http://www.ntua.gr/arrows/finalhb6a2.pdf>

10 [http://www.asfinag.at/c/document\\_library/get\\_file?uuid=ccd7dbb6-3e9f-4ad0-9f6b-842f3651acfd&groupId=10136](http://www.asfinag.at/c/document_library/get_file?uuid=ccd7dbb6-3e9f-4ad0-9f6b-842f3651acfd&groupId=10136)

11 European Union Road Federation (2007) Safety on motorway Work zones, Discussion Paper.

12 <http://www.thenewspaper.com/rlc/docs/04-tr1595.pdf>

13 Ibid

## 1.4 Nature of the problem

From a road safety viewpoint the risks involved with RWZs can include risk of collisions between general road users (vehicles, cyclists, pedestrians) and barriers, equipment, vehicles or personnel associated with the RWZ as well as collisions involving only road users due to the disturbance induced by the RWZ to the normal traffic flow (e.g. side sweep crashes due to sudden lane changes, rear-end crashes due to sudden braking). Identification of the exact causes of collisions is often difficult to ascertain as a combination of factors may interact to culminate in a collision. As such it is difficult to ascertain when the presence of a work zone on or near a road or its characteristics has directly resulted in road traffic collisions. From the worker safety viewpoint the risks involved with RWZs can include risk of collisions in or outside the work zone, or when the worker enters or leaves the work zone. The collisions can happen with passing vehicles or work vehicles. The worker can be a pedestrian or driving a vehicle.

The dynamic and fluid nature of road related work zones has the potential to result in a deterioration of safety and an increase in risk factors. RWZs represent unexpected and uncharacteristic changes to the road network and present immediate and unavoidable scenarios for drivers thereby contributing to driver confusion and error. Work zones are a deviation from the normal road scenario in terms of functionality, legibility, speed and space. By their very nature the interaction of 'work tasks' carried out by employees with the general public in the form of road users presents an added risk scenario.

A number of studies have been carried out attempting to provide clarity in this area and to inform the development of safer processes and approaches around work zones through the identification of causes of collisions. Research has shown that roadworks that are carried out over a longer period and that cover a longer work zone seem to have a

lower crash rate than short term works and that the actual operational area where physical works are occurring appears to be more risky at the access and egress to the work zone<sup>14</sup>. In rural areas, roadwork's crashes often occur in the vicinity of approach roads and exits and are often rear end collisions where road blocks are present<sup>15</sup>. Intersections where traffic from side road joins a main road with a work zone have been identified as relatively dangerous in urban areas. 'The work zone is sometimes closed off badly, it is not always clear which adjustments in behaviour are required of cyclists, and the sign 'cyclists dismount' is sometimes applied incorrectly'<sup>16</sup>.

Driver perceptions and actions are a significant contributory factor to collisions at road side work zones. Speed is the number one cause of road traffic deaths<sup>17</sup>. In this regard the PREVENT study stated that 'the most consistent finding is that speeding is common at roadworks... (and)...the majority of drivers drive too fast when approaching roadworks'<sup>18</sup>. A study in France demonstrated that 44% of road users were speeding in the vicinity of road works (excess speed at least 20 km/h) while 20% were failed to ensure the provision of safe distances with other vehicles.<sup>19</sup> Road users fail to realise the extent of their vulnerability or to perceive the increased risk around presented by the presence of works on or adjacent to roads.

The cause of real concern regarding driver behaviour at RWZs is the fact that drivers believe that they take sufficient caution. 'Experimental studies have shown that the majority of drivers in fact approach road works zones driving too fast for the circumstances, and usually well above the posted speed limit. Moreover they do not decelerate until just before an abrupt change in the conditions...and then in an extremely abrupt manner'<sup>20</sup>.

On the other hand a Dutch study into RWZ safety

14 [http://www.swov.nl/rapport/Factsheets/UK/FS\\_Road\\_works.pdf](http://www.swov.nl/rapport/Factsheets/UK/FS_Road_works.pdf)

15 <http://www.ntua.gr/arrows/finalhb6a2.pdf>

16 [http://www.swov.nl/rapport/Factsheets/UK/FS\\_Road\\_works.pdf](http://www.swov.nl/rapport/Factsheets/UK/FS_Road_works.pdf)

17 <http://www.etsc.eu/documents/ETSC%20PIN%20Annual%20Report%202009.pdf>

18 <http://www.hit.certh.gr/prevent/media/Deliverables/Handbook.pdf>

19 [http://www.seine-maritime.equipement.gouv.fr/IMG/pdf/Dossier\\_de\\_presse\\_cle2a2a21.pdf](http://www.seine-maritime.equipement.gouv.fr/IMG/pdf/Dossier_de_presse_cle2a2a21.pdf)

20 <http://www.ntua.gr/arrows/finalhb6a2.pdf>

showed that RWZs are not always guarded appropriately, resulting in confused road users entering the work zone and road workers working at the very edges of and even outside the RWZ<sup>21</sup>.

Work on roads complicates the driving task and can lead to driver error or/and violations. Driver behaviour resulting in RWZ collisions includes:

- Excessive speed before or adjacent to the work zone
- Changing lanes too late
- Inappropriate following distances

### 1.5 Quantification

There is a need for more comprehensive and harmonised data collection in relation to RWZ collisions, their causes and their consequences in order to inform the development of safety enhancing measures. In this regard clear definitions and reporting arrangements need to be established. 'Traffic volumes, speed before the work zone and in the work zone, weather conditions, time and day of accident, lighting and road surface conditions and general road infrastructure (number of lanes before and after work zone, type of road) are the external factors that could be included in accident records to give the general idea of the conditions in that an accident has occurred'.<sup>22</sup>

The situation is further complicated when third parties are involved as reporting mechanisms do not support identification of third party involvement in incidents relating to RWZs. In the UK employers are required to report any injuries that occur at work; however, incidents which occur on roads are excluded from

- Losing control of the vehicle

In the context of the above it is clear that work zones on and adjacent to roads are an additional threat to road users and workers alike as well as to the mobility on European roads. The increased risk at RWZs needs to be recognised by the EU, National governments as well as employers and steps taken to reduce this risks and associated deaths and injuries. Occupational health and safety needs to be integrated into the overall road works planning and execution process.

the workplace reporting requirements. Accidents at road and street works have, historically, been under reported, with a lack of data on works related incidents.

Some good practice approaches of more detailed data collection do exist. In Germany for example, there is official data relating to road works and in-depth collision analyses that can allow for the identification of road works typology and potential collision causation factors. In Ireland police have agreed to collect collision data that facilitates identification of the context of road use of people involved in road collisions. The changes will specifically identify people engaged in driving for work or working on or near the road and non-workers involved in collisions with the latter.

In general data collection is piecemeal and lacking in detail with no means of comparing across the European Union.

21 Venema, A., et al. (2008). Aanrijdgevaar wegwerkers; Eindrapport. Van den Berg Infrastructuren, Zwammerdam.  
22 <http://www.ntua.gr/arrows/finalhb6a2.pdf>

## Recommendations

### Employers

- Carry out studies to identify change in collision risk associated with works activities.
- Develop systems to record work zone characteristics and incidence occurrence and share this information.
- Carry out before and after studies to identify change in collision risk associated with works activities.
- Carry out risk assessment before every road work activity
- Monitor road work collisions, incidents and near misses

### Member States

- Change collision data collection to facilitate the identification of collisions occurring in or near work zones and the primary causal factors, including police reporting procedures.
- Carry out before and after studies to identify change in collision risk associated with works activities.
- Finance further research focusing on the behaviour of workers at work zones.
- Finance further research on the vehicle type, pedestrians and cyclist interaction with work zone areas.

### EU

- Support the revision of police reporting procedures at the national level to facilitate the identification of collisions occurring in or near work zones
- Facilitate changes to collision data collection and identify good practice in this area.
- Support studies to increase the knowledge of the issues at stake, coordinating traffic and occupational health and safety policies

## 1.6 Existing Guidance and Regulations

At both European and Member State level a range of legislation and guidance exists that is relevant to the issue of safety in the context of working on or near roads either directly or indirectly. At the European level a number of Directives have been developed that have implications for this area in terms of provisions for standards and procedures.

Directive 92/57/EEC<sup>23</sup> relating to 'Temporary or mobile construction sites' sets out minimum safety and health requirements for temporary or mobile construction sites (i.e. any construction site at which building or civil engineering works are carried out) and intends to prevent risks by establishing a chain of responsibility linking all the parties involved. While Annex I of the Directive does not explicitly state that it applies to road works, several of the mentioned activities are a part of road construction. In Belgium,

for example, the Royal Decree transposing this directive includes temporary road works when more than one contractor is involved (which is almost always the case. In the UK, construction work is defined to include road works.

Safety Framework Directive 89/391/EEC<sup>24</sup> underlines the onus on employers to protect their employees and states that they should evaluate the risks to the health and safety of their workers and take measures necessary for the safety and health protection of workers. This requires a risk assessment based approach to safety management.

The Personal Protective Equipment Directive 1989/686<sup>25</sup> applies to any device or appliance designed to be worn or held by an individual for protection against one or more health and safety hazards (as defined in the Directive).

23 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1992L0057:20070627:EN:PDF>

24 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31989L0391:EN:HTML>

25 <http://ec.europa.eu/enterprise/sectors/mechanical/documents/legislation/personal-protective-equipment/>

Directive 2008/96/EC<sup>26</sup> on Road Infrastructure Safety Management introduces a comprehensive system of road infrastructure safety management and is also highly relevant. It addresses projects for the construction of new road infrastructure or substantial modifications to the existing network which affects the traffic flow within the trans-European road network. The Directive also includes the obligation of Member States to adopt guidelines on temporary safety measures applying to roadworks under Article 6. Member States' guidelines will be made available on a public website. Article 6 also states that safety inspections shall comprise of periodic inspections of the road network and surveys on the possible impact of roadworks on the safety of the traffic flow.

The Directive aims to promote the objective that safety must be integrated in all phases of planning, design and operation of road infrastructure. It must be regarded in its own right and separately from economic and environmental analysis. Member States were also encouraged but not mandated to apply the provisions of the directive to national road transport infrastructure, not included in the trans-European road network. In this regard the European Commission has funded the PILOT4SAFETY project which aims to apply the Directive's approaches related to training and certification of Road Safety Experts for the application of Road Safety Audit and Road Safety Inspection procedures to selected secondary roads, in the EU Regions represented in the project. The idea is to share good practices and define common agreed training curricula and tools for qualification of road safety personnel.<sup>27</sup>

The majority of Member States have also developed legislation and/or guidance relating to road works or at least some aspects of this. In some countries a legislative approach has been taken through which those carrying out certain types of road works are obliged to follow a standard approach in terms

of issues such as design, layout, equipment and other relevant issues while in other countries a 'recommended' guidance based approach had been taken which is not mandatory. Many Member States also have more than one type of guidance or set of regulations that applies to standards of work zone management and/or operation depending on the typology or road or road works. It is important for Member States to consider the approach to work in or adjacent to roads in a comprehensive and clear manner and to ensure that, where multiple documents exist, they are harmonised, logical and consistent.

There tends to be a greater focus on long term work zone management as this requires more comprehensive traffic management and forward planning efforts. While guidance in the area of short term and mobile work zones is also available, the approach put forward is largely sign based rather than process based. The reliance on signage alone is unlikely to maximise safety for workers. A priority should be to decide when barriers or another protection tool such as vehicles with barriers should be used to physically protect personnel in the installation and removal stage. It is important, for all types of works to facilitate a process based approach to the carrying out of works in or adjacent to roads that includes risk assessment, mitigation and monitoring.

It is evident that there is still work to be done in ensuring a comprehensive approach to safety provision for road works based occupations. There is a focus on the use of equipment to reduce risk which may not always consider fully the optimal approach in terms of ensuring the health and safety of employees. Mandatory guidance should be provided at the national level that sets out a process based approach to safe working on or near the road, putting people at the centre of procedures.

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26 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0096:EN:NOT>

27 <http://pilot4safety.fehrl.org/>



## 1.7 Case Studies

### UK

In the UK the Department of Transport has published the Traffic Signs Manual: Chapter 8: Traffic safety measures and signs for road works and temporary situations.<sup>28</sup> This document provides guidance for those responsible for the design of temporary traffic management arrangements which should be implemented to facilitate maintenance activities or in response to temporary situations. It contains advice relating to traffic safety measures, and the identity and location of the traffic signs needed to guide road users, including pedestrians, safely past obstructions in temporary situations. It is structured to facilitate and reflect the design process for temporary traffic management, from the initial broad brief to details of signing provision. It raises the principal issues that need to be considered in temporary traffic management design and provides advice about their resolution. The document deals with the design of

temporary traffic management arrangements on single carriageway roads and dual carriageway roads separately.

The Department for Transport has also published the Safety at Street Works and Road Works; a Code of Practice which sets out the principles to be followed when signing, guarding and lighting works on all highways and roads except motorways and dual carriageways with hard shoulders. This is known as the “Red Book” and is fully consistent with Chapter 8. Its purpose is to ensure that road users and operatives at sites remain safe when works are taking place in the highway. It has been written and published in a size suitable for operatives to carry in a van or tool box and so is readily available to consult on site. The Department for Transport has just completed a consultation exercise to review and update this Code of Practice.

### Germany

The German Statutory Accident Insurance (GUV Unfallkasse), the professional association for the construction industry (BG Bau) and the German Road Safety Council (DVR) published in 2008 a booklet on traffic safety at roadworks<sup>29</sup>. The booklet identifies the legal basis

for such work, with the particular issues of construction methods and the consequences for the safety of workers into the foreground. Acceptance, inspection and maintenance of the roadwork site itself is covered looking at, for example, how often the site has to be inspected.

### The Netherlands

The Netherlands have guidelines for the uniform preparation of work zones which place an emphasis on being simple and clear and stress that distance

and/or division between road workers and traffic / other users is important. The guidelines however, do not have a basis in law.<sup>30</sup>

### Italy

In Italy a mandatory legislation exists since 2002 (Decree of the Ministry of Transportation and Infrastructure, 10.07.2002) focused predominantly on signage provision and workers visibility requirements as a safety mechanism. Specific attention is paid in defining the protection of pedestrians in urban work zones. On the other hand, no details on the physical

protection of work zones are currently included in the Decree. Since 1996 (National Law 494/96 recently updated with National Law 81/2008) a Coordination Safety Plan, prepared by a qualified work zone safety expert, is required as mandatory for any public work but a specific module on road related work zones is usually not offered in the official training courses.

28 <http://www.dft.gov.uk/pgr/roads/tss/tsmanual/tsmchap8part2.pdf>

29 <http://www.bgbau-medien.de/bau/baustverk/inhalt.htm>

30 [http://www.crow.nl/nl/Navigator/over/Over\\_CROW.html](http://www.crow.nl/nl/Navigator/over/Over_CROW.html)

## Ireland

In Ireland, specific legislation and guidance exist including the 'Guidance for the Control and Management of Traffic at Road Works' which provides

design guidance for temporary traffic management at road works on single carriage road ways.<sup>31</sup>

## Switzerland

In Switzerland there are legal framework directives and a control body called Suva, which is competent for safety at work. Roadwork zones, signings,

markings are regulated in the VSS (Swiss Association of Road and Transportation Experts). There is also a "Bulletin for safety of workers during road works".

## Recommendations

### Employers

- Work proactively with Member States to produce more process focused rather than equipment focused guidance and legislation
- Utilise guidance as standard practice in carrying out work

### Member States

- Develop legal standards for working on roads
- Produce guidance that is process based rather than signage based
- Produce guidance that focuses on the human factor as well as the traffic factor
- Produce legislation that is clear and enforceable to ensure that it is applied
- Produce guidance including decision making tools that aid those responsible for planning and managing work zones to achieve integration between the traffic management and safety objectives
- Apply the principles of the EU Infrastructure Safety Directive (2008/96/EC), not only to the TEN-T network but, to the rest of the road network.

## EU

- Work towards harmonisation of standards and guidance nationally and across the EU
- Collate various approaches and disseminate good practice
- Support common EU curricula for road safety professionals (auditors/inspectors)

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31[http://www.transport.ie/upload/general/12714-GUIDANCE\\_FOR\\_THE\\_CONTROL\\_AND\\_MANAGEMENT\\_OF\\_TRAFFIC\\_AT\\_ROADWORKS\\_SECOND\\_EDITION\\_2010-0.PDF](http://www.transport.ie/upload/general/12714-GUIDANCE_FOR_THE_CONTROL_AND_MANAGEMENT_OF_TRAFFIC_AT_ROADWORKS_SECOND_EDITION_2010-0.PDF)

## Part 2: Planning

### 2.1 Minimising Works Strategically

Safety, including the safety of workers, should be a key consideration at all stages in the life cycle of any road related works project whether it be long, medium or short term or mobile. Project planning, including the tendering process carried out by clients, should incorporate work zone safety risk assessment, impacts and mitigation measures as a matter of course. Consideration of the safety of those working in the work zone solely by the contractor or direct employer is an approach that does not facilitate adequate consideration of safety issues. Clients, including Highways Agencies and/or local authorities, should be proactive and visible in attempting to improve the safety of those working in and around roads as well as that of road users.

The issue of maintenance should be considered from the outset of the design stage in terms of new roads or proposed amendment/renewal of existing roads. In this regard designers should investigate means of engineering out the need for maintenance and engineering in measures that support safe maintenance from the outset.

Design of roads to facilitate safe operation and maintenance of the road long before any works are required needs to be ensured. The design of roads should be based on the principle of minimal intervention which tries to ensure that minimal changes to the original road structure will be required. Design that contributes to legibility and reduces the need for roads users to modify their behaviour should be a primary aim.

The risk posed by road works could be minimised by aiming to develop 'zero maintenance' roads. While this would not impact on all types of work occurring on or adjacent to roads it offers the potential to almost completely negate the need for traditional road works thereby achieving huge risk reduction to both workers and general road users.

'It is...a reasonable objective for road transport safety to reduce downtime due to construction

and increase the level of service. Research includes concepts to increase durability and reduce maintenance interventions and costs by advanced asset management approaches. The challenge is to unify expectations and lifecycle cost reduction by at the same time increasing availability, quality and reliability of the road infrastructure network. This and traffic safety concepts especially in road construction areas will aid in reducing collision risk. Safety of road workers and concepts to reduce the risk of collisions involving road workers is of specific interest' .

While zero maintenance roads may not be achievable in the short term and maintenance is envisaged, designers should consider this need at the design stage. Agencies should realise the importance of life cycle costing rather than initial costing in determining design and building of projects as this has the potential to reduce the duration and frequency of work zones.

Roads Authorities should adopt a life-cycle approach to planning and operating roads infrastructure using 'asset management' as a tool to maintain existing infrastructure in an efficient way, ensuring that it meets safety standards and optimising its use. Such an approach can facilitate reduced maintenance needs by allowing a more targeted approach. 'Good asset management tools must be developed to support decision making by road authorities with respect to maintenance strategies and reserving funds for conservation of the road networks. Monitoring systems to quickly establish the condition of the infrastructure, performance models for structures, materials and maintenance techniques to forecast' should be developed and utilised. The ability to reduce maintenance needs will reduce overall risk on the roads to both workers and other road users.

'Smart maintenance techniques are developed to reduce 'downtime' of the road, for example surface treatment sprays to revitalise surface properties and prefab surface layers (pavement on a roll) allowing partially and rapid replacement and upgrading of

pavements. New prefab methods of road construction are used to build new roads or upgrade existing ones. Prefab constructions provide high quality because of the high level of production conditions and the introduction of new techniques and materials.



Other smart solutions like temporary ‘bridges’ are used to roof over maintenance work, thus relieving congestion, reducing the need for diversions and creating safe conditions for the workers<sup>34</sup>.

Opportunities also exist to reduce the risk posed by road works by designing in safety measures such as lay-bys, pull-of maintenance areas and ensuring minimum widths of verges or medians that will provide a safer working environment. Planning should consider the broader business case of including social benefits and the value of workers as assets as well as the long-term savings to be made through initial higher spends on methods of engineering out maintenance requirements rather than the narrow approach focused on upfront cost and traffic management impacts.

## Recommendations

### Employers and Member States

- Design out the need for maintenance - work towards ‘zero maintenance’ roads (research and innovation in advancing materials, constructions techniques, etc)
- Design in mechanisms to support safety maintenance when required
- Utilise asset management and life cycle approaches to target, coordinate and minimise the number of maintenance interventions required

### EU

- Support the development of maintenance free roads
- Support a life cycle approach to infrastructure construction and maintenance

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34 Ibid p 17

## 2.2 Procurement

‘European contracting rules and tender procedures tend to give the contract to the construction company who does the work at the lowest costs. Occupational health and safety is generally not an important issue in these procedures’<sup>35</sup>. Risks increase due to limited road spaces that are appointed to the road workers as well as limited time slots that are available (road works on major roads are preferably carried out during the night). Tenders for road construction projects are generally won by those companies that can work without hindering traffic mobility<sup>36</sup>. This is an area that should be addressed in order to provide safer working environments and reduce the risk associated with RWZs.

At the European level Directive 2004/18/EC<sup>37</sup>, on coordination of procedures for the award of public works contracts, public supply contracts and public service contracts applies to the construction of roads and installation of signage. The inclusion of the need to take account of safety aspects into this Directive should be considered within the ongoing revision.

Governments can bring about change by setting an example. They can influence demand through their own public procurement policies. There is in fact great potential to do this. All non-private customers, such as governmental bodies, local authorities and companies can play an important role by including specific requirements to achieve high levels of safety at roadworks in their tendering processes. In doing so, they can improve the balance between safety and efficiency at road works and work towards the inclusion of comprehensive safety measures as standard practice.

Organisations and companies both on the client and contractor side should consider the use of safety related performance goals as a mechanism to facilitate improvement. Such goals could focus not only on reducing work zone related collisions but also more specifically on reducing worker injury rates. Clients should also utilise the contracting procedure by specifying safety improvements in relation to

required procedures or equipment use. Such an approach has the potential to raise the importance of safety considerations in RWZ planning and shift the focus from congestion and cost based approaches.

The focus on bids which appear to be most economically advantageous and those which offer least impact on traffic flows or disruption is often at the cost of any robust risk assessment and provision of adequate safety measures relating to work zones. As such work zone stakeholders may have a negative incentive to disregard or neglect safety issues. This problem is exemplified as subcontracting occurs with pressure on employers and employees alike to meet restrictive time and budget deadlines. ‘A perverse incentive is frequently created to disregard safety rules in favour of engineering considerations or to avoid late finish penalties’<sup>38</sup>.

Time allocations reserved to do road works are generally too short and the offer to contractors of possible bonuses to finish within schedule is an additional risk. This approach is not recommended from a safety point of view. A more progressive safety conscious approach that is being utilised in some public-private partnership arrangements is to link safety criteria to payment so that a percentage of money that is going to be paid depends on the safety results (lack of incidents) of the project. Such an approach is particularly relevant to government authorities. Contractor performance should also be judged in terms of safety, not just time and cost.

The number of stakeholders potentially involved in a RWZ, their objectives and defined responsibilities can cause further problems to the detriment of safety. In many cases road work related companies are contracted by government/roads authorities or sub contracted by large companies. A number of ‘contractors’ often work together at a single work zone. Cross organisational cooperation is also required in terms of specifying safety procedures and setting high safety standards. Cooperation should also form the basis for a risk assessment where

35 SAFEROWOZO. Safe Road Work zones. Project proposal. Venema, A & Van der Vorm, J. TNO, Hoofddorp, 2009

36 Venema, A., et al. (2008). Aanrijdgevaar wegwerkers; Eindrapport. Van den Berg Infrastructuren, Zwammerdam.

37 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:134:0114:0240:EN:PDF>

38 ERF (2007) Safety on motorway Work zones, Discussion Paper.

companies or contractors are operating in a single work zone or within the vicinity of each other. This is necessary to ensure that there is a coherent and effective approach to reducing risk and ensuring safety. There is a need for sharing of information between highways agencies and utilities providers in relation to the forward planning of projects and maintenance requirements.

Tendering processes should stipulate that cooperation occurs in terms of risk assessment and safety planning.

## Recommendations

### Employers

- Engage in a competition to meet high standards of safety during the procurement process.
- Regardless of their size, develop a policy with supporting procedures aimed at preventing collisions at work zones and ensuring worker health and safety.

### Member States

- Develop further guidance on setting safety related performance goals and ensuring safety measures through contractual obligations and budget.
- Ensure all tenders include criteria relating to provision for safety and safety standards specifically for workers as well as other road users.
- Investigate the possibility of setting up formal agreements for coordination between contractors.
- Include risk assessment of employees and subsequent training and qualification checks during procurement process.

### EU

- Revise the EU Directive on Public Procurement to addresses safety aspects

## 2.3 Planning the Work zone

During the work planning phase, fundamental decisions about the RWZ are made which dictate levels of safety either directly or indirectly. 'When determining the timing, form and type of road works, a balance should be achieved between the following:

- Safety of road users and workers
- Traffic flow and road user inconvenience
- Efficient work zone scheduling and economical traffic operation
- Environmental impact and other quality requirements

Other prerequisites could also be set down during the tendering process and tied in through contracting arrangements such as specification of the need for worker/live traffic separation devices.

Training should also be one of the points to be checked during the procurement process. The transport contractor should include training and qualification requirements of the employees chosen to undertake the work. Here governments too can do more in term of instructing and educating their own employees.

The impact of the roadworks as regards space, time and cost should be minimised as far as possible; at the same time, safety, environmental and other quality standards must be met'.<sup>39</sup>

More work needs to be done in achieving this balance with traditional approaches focusing largely on ensuring the efficient flow of traffic failing to adequately balance this with safety of workers. To-date integration between existing frameworks for workers and frameworks for road users isn't achieved.

<sup>39</sup> <http://www.ntua.gr/arrows/finalhb6a2.pdf>

Strategic level initiatives that have the potential to help redress this balance have been outlined in the Section above including zero maintenance roads, lifecycle management, procurement procedural changes and integration of occupation health and safety consideration into planning. At the lower level other initiatives can also be applied to reduce maintenance requirements and to reduce risk.

Steps should be taken to reduce the number of road works required through forward planning and cooperation between relevant organisations (highways agencies, local authorities, utility operators). Cooperation should ensure that, where safe and practical, works required in an area can be combined and carried out at the same time rather than separately. This has the potential to avoid the use of numerous short work zones and thereby reduce the safety risk.

“Road works and other works that can affect the availability of the road should be coordinated. Different works on the same site should as much as

possible be combined to limit the period of reduced availability of the road...This would limit interference between works and traffic and increase the security of workers. Additionally, it should be avoided that traffic trying to avoid road works on one site, ends up in another work zone”<sup>40</sup>.

To reduce the risk exposure of both road workers and road users the use of strategies including road closure or night time working may be considered which can limit the actual time required to carry out work and the interaction between a live work zone and the general public. Further research is required in order to identify the costs and benefits of such approaches not only in terms of money and time but also in terms of the safety of the workers and the safety of other road users. Such research including collecting and analysing data would be useful in order to aid decision making at the planning stage as to when such strategies should be adopted. In this regard there is a need for a more formal approach or set of guidelines on when to use such strategies which fully incorporate worker safety in the decision making process.

## Recommendations

### Employers and Member States

- Develop processes to ensure coordination and combining of works
- Stimulate research to provide a greater understanding of the balance between traffic impact and safety of strategies such as road closures, lane closures, night-time working
- Develop a more formal, evidence based guidance on deciding when to adopt the above strategies

## 2.4 Safety Appraisal, Risk Assessments and Safety Plans

A safety appraisal is a systematic and critical examination of the workplace for the purpose of identifying hazards, assessing the risk and recommending controls to reduce the risk, where appropriate. Risk is a measure of the likelihood of a collision occurring coupled with the potential severity of the injury or loss. When the safety appraisal identifies a hazard, it is necessary to assess the risk in order to determine what control measures should be introduced. The risk assessment assesses both the probability of an incident occurring and the consequences of the incident.

Safety appraisals and risk assessment should be carried out prior to all proposed works in or adjacent to roads. The level of detail involved should reflect the complexity of the work proposed and the local environment and should cover both issues relating specifically to employees as well as all other road users: pedestrians, cyclists, public transport, HGV's and cars as different hazards risks and subsequently mitigation measures may emerge.

Measures to remove or minimise risk should be developed and integrated with the transport management plan to ensure safety is paramount

40 NAVB-CNAC Witboek wegenwerken-Livre blanc Travaux de voirie <http://navb.constructiv.be/nl/Welzijnsinfo/Publicaties.aspx?Page=46>  
Short summary in English provided by Kris Redant

at all times. This will require an iterative process in order to reach a balance between safety provision and transport efficiency (See Section 2.10 below). To ensure that this takes place it is important to designate a person responsible for safety in relation to each work zone and to put in place systems of checks or reporting mechanisms to be used at the operational, installation and removal stages. In Belgium the appointment of a safety coordinator is mandatory; however, this is not always applied by contractors. As such enforcement of inspections needs to be addressed<sup>41</sup>. In Italy a qualified expert responsible for the work zone safety has to be appointed by the contractors in every public work according to the National Law 81/2008 (former 494/1996).

Risk Assessment should be carried out by all those involved in working on or near roads regardless of the size or company or works to be progressed. In this regard the risk assessments procedures can be targeted and tailored to match the complexity of the situation. Overall, it is important for organisations considering employee training to have an effective

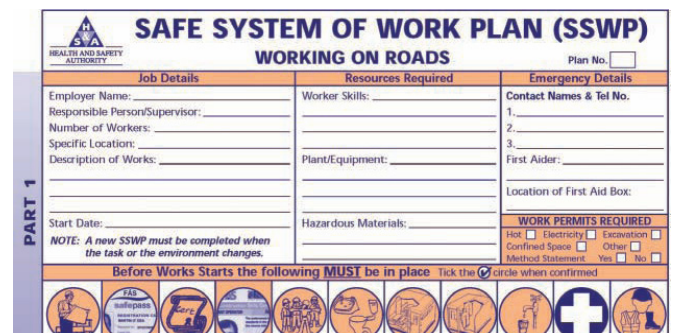
## 2.4.1 Case Studies

### Ireland

In Ireland the Health and Safety Authority has developed a Code of Practice aimed at Contractors involved in Roadwork and Road Maintenance<sup>45</sup> activities where three or less persons are employed as part of its broader Safe Systems of Work procedures<sup>46</sup>. The aim of this Code of Practice is to improve the level of safety and health among small-scale employers and contractors (employing up to three employees) engaging in road works and to assist them in putting a Safety Statement in place. The Code provides guidance to employers on how to plan and work safely on site. In implementing the Code employers can use a 'Safe Systems of Work Plan' (SSWP) provided by the HSA which is a simple tool to aid risk assessment and safety planning.

risk assessment-led process under the Framework Directive 89/391/EEC<sup>42</sup>. Under Article 6, within the context of their responsibilities, the employer shall take necessary measures for the safety and health protection of workers, including prevention of occupational risks and provision of information and training, as well as provision of the necessary organisation and means. Article 12 on the training of workers states that, the employer shall ensure that each worker receives adequate safety and health training. Also training should take place in the event of the introduction of new work equipment or a change in equipment, or in the event of the introduction of any new technology.

Risk assessment should also cover whether or not personnel are capable of understanding and acting upon instructions, have good hearing and eyesight. They should also assess that safety is not compromised by them suffering from specific conditions or illnesses<sup>43</sup>. PREVENT WP3 developed tools for the training for workers, supervisors and inspectors<sup>44</sup>.



Part 1 provides for recording descriptions of the workplace, the work activities and the skills and resources needed to carry out the work. Details must also be provided of who is in charge of the works

41 NAVB-CNAC Witboek wegenwerken-Livre blanc Travaux de voirie <http://navb.constructiv.be/nl/Welzijnsinfo/Publicaties.aspx?Page=46>  
Short summary in English provided by Kris Redant

42 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31989L0391:EN:HTML>

43 <http://www.dft.gov.uk/ha/standards/ians/pdfs/ian115.pdf>

44 <http://www.hit.certh.gr/prevent/media/Deliverables/D2.pdf>

45 <http://www.dft.gov.uk/ha/standards/ians/pdfs/ian115.pdf>

46 [http://www.hsa.ie/eng/Publications\\_and\\_Forms/Publications](http://www.hsa.ie/eng/Publications_and_Forms/Publications)



and emergency contact details. Part 2 provides for the identification of hazards and control measures to deal with these and a check mechanism to ensure that measures are put in place before work commences. Part 3 allows those who are going to

work on the activity to sign off on the SSWP and should be completed by the person who prepared the SSWP and the workers to confirm that the SSWP has been brought to their attention.

## Austria

ASFINAG plans, finances, maintains and tolls the entire Austrian motorway and expressway network covering 2,175 kilometers and has recently published a Road Safety Programme to 2020<sup>48</sup> which includes comprehensive collision prevention measures aimed at making Austrian roads safer. Part of the plan specifically targets practices surrounding road works zones putting in place new procedures to improve efficiency, reduce cost and improve safety. The procedures include the development of a handbook to set standard practice and the use of checks and inspections to ensure that safety planning is implemented and maintained. In relation to risk assessment, safety planning and monitoring, the Road Safety Programme provides for the following in relation to RWZs:

- New roadwork zones will be inspected together with the police and undergo intense observation in the first days after traffic approval.

- During the entire duration daily road safety checks will be performed and fines given out to construction companies if defects are caused by them.
- Observations about defects from ASFINAG Pilot and via the ASFINAG Service Centre are handled with the highest priority.
- The Road safety checks of roadwork zones are performed in accordance with the European Infrastructure Directive
- New Roadwork Zone Handbook is prepared (in accordance with the RVS 05.05.42).
- At roadwork zones that have a significant influence on the traffic flow Road Safety Audits (RSA) are performed in advance.
- In terms of work safety the project manager will write a protocol of all work collisions and their consequences, from start to approval of the roadwork zone.

## Recommendations

### Employers

- Understand that safety measures are necessary for every type of RWZ. Even when the work zone has a very short duration, occupies a very short length, or is located on the hard shoulder or the roadside - the potential implications for safety should be always considered<sup>48</sup>.
- Develop safe systems of work procedures
- Carry out a safety appraisal and risk assessment for all proposed works
- Provide a safety statement or plan for each work zone
- Designate a competent person with specific responsibility for safety for each works project
- Monitor the implementation of the Safety statement / plan throughout the work duration

### Member States

- Assist in the development of standard practice safe systems of work procedures
- Consider the need for an authority/3rd party/regulator to audit/check the planning for works in terms of meeting safety criteria prior to the commencement of works

### EU

- Support the inclusion of a “work zone safety management” in a common EU curriculum for road safety auditors/inspectors
- Disseminate best practices on Road Safety Audits and Risk Assessment on work zones

47 [http://www.asfinag.at/c/document\\_library/get\\_file?uuid=ccd7dbb6-3e9f-4ad0-9f6b-842f3651acfd&groupId=10136](http://www.asfinag.at/c/document_library/get_file?uuid=ccd7dbb6-3e9f-4ad0-9f6b-842f3651acfd&groupId=10136)

48 <http://www.ntua.gr/arrows/finalhb6a2.pdf>

## 2.5 Personnel

Inherent in the planning procedure relating to road works is the need to redress the balance between traffic management and employee safety. The risks for workers are not always recognised.

Occupational health and safety must be integrated into the overall road works planning and execution process. Changes to the procurement process as suggested above can work towards achieving this however more can also be done by employers in terms of internal arrangements.

A change in focus is required away from the impact on journey times and the traffic network towards the value of employees and the moral and legal

### 2.5.1 Case Studies

#### UK

The UK Highways Agency are progressive in their commitment to improving the safety of their road worker employees, having adopted an 'Aiming for Zero' approach to health and safety including eliminating all deaths and serious injuries to road workers maintaining the road network. Central to the approach is a goal of 'Exposure Zero' 'to eliminate the need for road workers involved in routine maintenance of (the) road network to be on foot on the live carriageway' as this is when they are most at risk. In attempting to deliver the goal they have carried out a review of operations that require road workers to be exposed to live traffic, with a

## 2.6 Training

There is a requirement for compulsory training on safety and health issues (Article 12 of Framework Directive 89/391/EEC). Training should be risk assessment led or based on a needs analysis. People planning and managing work zones need to be qualified and as such standard practice training programmes should be developed specifically focusing on working on or adjacent to roads in order to embed safety into work processes. Training must focus on work methods (deciding what safety measures to implement, how and when) as well

obligation to work towards a vision of zero risk for those working on the roads. Companies and authorities with employees that carry out work on or adjacent to roads should develop specific policies and procedures to ensure the upmost safety in this, area.

Organizations should aim to adopt a 'vision zero' for RWZ related collisions. The absence of a true safety culture amongst road authorities and private contractors with specific targets elevates risk associated with road works zones even before the complexities of interactions with the general public and operation of the zone are considered.

view to reducing risks, and a revision of maintenance priorities to reduce the number of visits and ad-hoc repairs and maintenance to cut the need for road workers to be on the network<sup>49</sup>.

One of the most likely ways of achieving Zero Exposure is through the development and use of new technologies which mechanise some of the high risk tasks involved in road maintenance. The Agency has also been trialing new technology and ways of working which aim to remove the road worker from the roadway as much as possible.

as equipment usage, covering signage, barriers, clothing, safety inspection procedures and planning for what happens in case of an incident. Workers also need to be specifically trained in the operation of traffic control devices. At the international level there also exists an OHSAS 18000 (occupational health and safety management) document through which companies can receive certification according in this area. OHSAS 18000 is management system specification. National governments should take a leading role in setting standards for training in

49 [http://www.highways.gov.uk/knowledge/documents/Road\\_worker\\_Safety\\_Strategy\\_Action\\_Plan\\_2009-11.pdf](http://www.highways.gov.uk/knowledge/documents/Road_worker_Safety_Strategy_Action_Plan_2009-11.pdf) and [http://www.highways.gov.uk/knowledge/documents/Road\\_worker\\_Safety\\_Strategy.pdf](http://www.highways.gov.uk/knowledge/documents/Road_worker_Safety_Strategy.pdf)

this field and ensuring uptake. In Belgium a system of training and certification has been developed<sup>50</sup> while in Germany the DVR organises seminars for workers and safety officers of companies on how

to deal with work zones. In UK, Sector Schemes are used to agree training levels required by work type, together with the relevant industry representatives.

## 2.6.1 Case Studies

### Ireland

Ireland has recognised that, in order to stay safe in construction, everybody working in the sector must have specific training. A system of mandatory training and registration requirements for workers under safety and health legislation has been developed and also applies to those working in road maintenance in order to ensure that competent people are carrying out the works.

Workers must hold a valid Safe Pass qualification<sup>51</sup> and must renew this every four years. The training modules cover safety culture, duties and responsibilities at work, collision reporting and prevention, and special working situations such as working at height and excavations. Safe Pass also covers personal protective equipment (PPE), use of hand-held equipment, tools and machinery, safe use of vehicles, noise and vibration, manual handling, and health and hygiene.

A more specific Construction Skills Certification

### Germany

The German construction industry (BG Bau) and the German Road Safety Council (DVR) have developed a seminar covering training<sup>53</sup>. The seminar is aimed at all those responsible for site safety- from planning approval through to implementation. The current laws and the requirements of the 1995 revised

### Italy

In Italy a training course is mandatory to become a qualified expert in RWZ safety according to the National Law 81/2008 (former 494/1996) but specific modules on RWZs are usually not included with

Scheme (CSCS)<sup>52</sup> provides for the training, assessment, certification and registration of construction workers undertaking certain tasks. The CSCS aims to raise standards of safety and health awareness, and so reduce risks and collisions throughout the industry. In relation to working on or adjacent to roads CSCS registration is specifically required for

- Signing, lighting and guarding on roads
- Locating underground services
- Assisting in the implementation of health and safety at roadworks

Operators who successfully complete an approved CSCS training and assessment programme are awarded certification from a national organisation and are added to a register. Under national Regulations, project supervisors must ensure that persons are in possession of the relevant CSCS card and safety awareness card before undertaking work in connection with roadworks.

“Guidelines for the safeguarding of jobs on roads” (RSA) are covered and the course is designed with different building blocks and can be used flexibly. The seminar can be conducted as a one- or two-day course. A brochure “Road Safety at Worksites” was also published in 2006 to accompany the course.

limited exception of course organised specifically for road authorities (as the ANAS training course which includes such specific module).

50 <http://www.besacc-vca.be/fr>

51 <http://www.fas.ie/en/Training/Employee+Training/Safe+Pass/>

52 <http://www.fas.ie/en/Training/Employee+Training/Construction+Skills+Certification+Scheme/>

53 [http://www.dvr.de/site.aspx?url=html/betriebe\\_bg/seminare/baustellen.htm](http://www.dvr.de/site.aspx?url=html/betriebe_bg/seminare/baustellen.htm)

## Recommendations

### Employers

- Ensure integration of occupational safety issues into the overall road works planning and operation process through the development of company policies and procedures
- Develop a goal driven approach focused on health and safety issues
- Develop a standard practice of carrying out risk assessment, including occupational risk assessment in relation to all works projects
- Develop a standard practice safety planning for all works projects
- Ensure implementation of a good safety plan with the employment of well-trained personnel on all levels is essential to achieve high safety levels. (Skills Certification Scheme)
- Ensure that there is a clear line of responsibility and that staff are competent and trained
- Ensure that workers behaviour is part of the process to ensure acceptance of the need for safety mechanisms

### Member States

- Support the development of training including qualification of trainers and topics covered in the training
- Help authorities/contractors to develop specific procedures for carrying out risk assessment for work zones
- Include specific modules on RWZs in national training programmes for RWZ safety experts

### EU

- Act as a catalyst for the development of EU wide training standards

## 2.7 Infrastructure: Transport Management Planning

Traffic Management is central to the planning phase and plays a vital role in providing continuity of safe and efficient road user flow and worker safety when a work zone occurs. The safest work area is one which is completely closed to traffic, however this is not possible without major impact on the road network in terms of traffic management requirements. A balance needs to be struck between consideration of the health and safety of workers and the efficiency of the network/safety of other road users. To date this balance has not been achieved to the detriment of those who work in and around roads. Planners and engineers need to take a more active role in relation to maintenance in order to reduce the impacts of work zones and improve their safety for all.

The traffic management plan should be location specific and will require the collection of information and data relating to the project (type of works to be carried out, phasing approaches/plans, number of actors involved) as well as characteristics of the transport network including the road alignment; vehicular volumes, patterns and composition; presence of pedestrians, cyclists and vulnerable

users, collision data; existence of permanent traffic control devices and other equipment; and alternative transport routes. Information on any other projects within the vicinity should also be compiled to assess the combined/cumulative impact of works.

Potential impact of planned works on the wider transport network for all modes should be assessed and, where possible, transport models should be used to provide an analytic assessment. The assessment should be evaluated not only in terms of congestion and journey time impacts but also in terms of overall safety on the network should proposed maintenance works be carried out. The risk exposure in surrounding areas may be changed as a direct result of migration of road users from around a work zone area. A multidisciplinary approach is required for input into the traffic management plan which should include personnel trained in the areas of road and occupational safety.

The traffic management plan and the design of the work zone should be of the same high standard

as for permanent roads and should incorporate the Principles of Sustainable Safety<sup>54</sup>. These were developed originally in 1992 in the Netherlands, and have become part of European road design and safety since then. These principles include:

- **Functionality** (the road / street / work zone should be designed to fit its purpose, e.g. cycling)
- **Legibility** (the road, junctions and conflicts should be obvious to all road users, and the resolution of conflict should be mutually understood by all road users and workers)
- **Forgiving Environment** (if an collision should occur, the outcome is as benign as possible for both workers and road users)
- **Homogeneity** (it is safer to mix traffic of similar mass, speed and direction thereby limiting exposure of workers to live traffic)
- **Self Awareness** (road users and workers should be aware of their competence)

Traffic management planning should also include a strategy for communications with the public that informs affected road users, the general public, area residences and businesses, and appropriate public bodies about the project, the expected work zone impacts, and any foreseen changing conditions. For larger road maintenance and construction projects interaction should commence at the planning stage with consultation and may include the following measures:

- Use of websites to allow the general public to access information on work zone activity and possible impacts to their travel routes which should be updated on a regular basis if not providing real-time information
- Encouraging people to move to other modes of travel such as bus and train where possible to minimise their interaction with RWZ
- Other media attention such as announcement on local radio, newspaper adverts
- Consultation at the design stage for larger projects with the general public
- Work zone awareness campaigns
- Material to educate the public on safety

issues relating to working on or near roads

For smaller road works warning in advance of installation of road works may be sufficient and more appropriate than consultation.

A number of Member States have already taken steps to ensure that communication is a central part of planning for road works. In Germany consultation with the public is a requirement and in the Netherlands, for major road works, companies must have a website setting out details about the works. In some countries roads authorities are also taking the initiative and have developed real-time websites to provide the public with information about road works, associated traffic conditions and possible diversions or alternative routes (UK Traffic England<sup>55</sup> and Highways Agency<sup>56</sup>).

At the planning stage the traffic management plan should also detail what measures will be taken to convey on site information about the road works during the installation, operation and removal periods and what measures will be used to make it clear to other road users what is expected of them in terms of behaviour. 'The plan should show the type and location of signs, closures, vehicles and other devices at each work site, and be done according to the regulations in force. Part of the plan is also a script for the setting up, the maintaining and the dismantling of the work zone. The plan establishes the responsibilities of road workers, road directors and safety inspectors. A trained official must approve the plan and should monitor the implementation of the plan.'<sup>57</sup> It is critical that the traffic management plan is clear and unambiguous both from the point of view of road users and road workers.

Handling speed and speed reductions should be central in the development of the traffic management plan. As previously noted, speed has been identified as the main cause of collisions at works zones.

54 [http://www.swov.nl/rapport/Factsheets/UK/FS\\_Sustainable\\_Safety\\_principles.pdf](http://www.swov.nl/rapport/Factsheets/UK/FS_Sustainable_Safety_principles.pdf) and <http://www.crow.nl/nl/Publicaties/publicatiedetail?code=REC26>

55 <http://www.trafficengland.com/disruptions.aspx?ct=true#ds>

56 <http://www.highways.gov.uk/traffic/traffic.aspx>

57 <http://www.ntua.gr/arrows/finalhb6a2.pdf>

During the planning process particular attention should be paid to agreeing on speed limits. These should be set based on the need to protect workers rather than to solely keep traffic flowing. A recommended technique is to use stepped speed limits, in properly-spaced steps of no more than 20 km/h. Speed limit changes should be implemented

before traffic is detoured, through the work zone, or adjacent to unprotected construction workers<sup>58</sup>.

Technology is important in both informing road users about required changes to their behaviour and in enforcement (See Section 4.7).

## Recommendations

### Employers

- Ensure that, at the planning level, suggestions about road safety are discussed with colleagues and other involved persons. A multidisciplinary approach is required.
- Ensure that designer visualise safety measures from the eyes of the road users, especially older drivers and other vulnerable users. Messages should be adequate and easily comprehensible.
- Ensure that signing and layout of road works are flexible, following changes and different phases of the work<sup>59</sup>.
- Assess the potential impact of planned works on the wider transport network for all modes, not only in terms of traffic impact but all impact on safety.
- Ensure that the traffic management plan and the design of the work zone should be of the same high standard as for permanent roads and should incorporate the Principles of Sustainable Safety.
- Communicate with others. 'The existence of a work zone should be announced to parties directly or indirectly affected or concerned, such as the police, emergency services (e.g. first aid or fire brigade), traffic information centres and authorities responsible for the management of adjacent roads'<sup>60</sup>.

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58 <http://www.ntua.gr/arrows/finalhb6a2.pdf>

59 Ibid

60 Ibid

## Part 3 Installation and Removal of Work Zones

The second stage of a work zone is that of preparing the area for work. This involves identifying the personnel needed for the work, the area for work and the equipment necessary for this part of the process. Different procedures have to be taken into account for urban, rural or highway road works. The installation of a work zone can be seen

as a small short term work zone before the main works begins. The last part of a work zone is the removal part which should be seen as the reverse of the installation and covers carefully taking away the extra signage and barriers before leaving the carriageway over to live traffic.

### 3.1 Personnel

Training for personnel must include the installation of a work zone. Workers need to be informed about the organisation and operation of the site, including all safety aspects, as well as about the emergency plan<sup>61</sup>.

the different contractors is mandatory. During the installation stage client leadership is very important in ensuring that there is the correct balance of risk between road workers and users.

One of the key issues in installing the work zone is the importance of co-ordinating between different people involved in the work as usually different contractors are involved. In some Member States (Germany, Ireland, UK) such co-ordination between

A priority should be to decide when barriers or another protection tool such as vehicles with crash cushions should be used to protect personnel in the installation and removal stage. A decision tool should be used as to help inform the work zone managers on this.

### 3.2 Infrastructure

'The installation of road works must be signposted in accordance with general principles governing proper signposting, i.e. they must give road users gradual, consistent and comprehensible warning of the type of obstructions and guide them on how to proceed in a safe manner'<sup>62</sup>. 'Installation of the work zone should take place at a time which is characterised by a lower traffic flow. The introduction of the new temporary work zone road markings should be well timed. When road works are carried out, the existing permanent markings should be covered to avoid confusion. Once the work is finished temporary markings should be removed without leaving any trace'<sup>63</sup>. 'Buffer zones and physical protection of workers are needed even during the preparatory phase. Traffic cones and other guidance and delineation equipment are no substitute for continuous physical protection measures'<sup>64</sup>.

smooth transitions between the normal roadway and the work area, as well as the provision of adequate space (buffer area) for separating the travelled way from the road works. This is also an important element to take care of when installing and removing the work zone. 'Before opening the work zone it is preferable to conduct both an internal and external check'<sup>65</sup>.

Elements of physical design include<sup>66</sup>:

- Lead-in taper and exit taper, providing a smooth change in lane width
- Longitudinal and lateral buffer width

Speed restrictions should be introduced as soon as the installation phase of the work zone goes ahead. Especially but not only during the installation and removal phase ITS can introduce information to drivers on more differentiated speed limits and these can be enforced accordingly.

The physical design of RWZs aims at the provision of

61 Ibid

62 EUROPEAN UNION ROAD FEDERATION (2007) Safety on motorway Work zones, Discussion Paper

63 [http://www.etsc.eu/documents/FINAL\\_Fact\\_Sheet\\_Conspicuity.pdf](http://www.etsc.eu/documents/FINAL_Fact_Sheet_Conspicuity.pdf)

64 Ibid

65 <http://www.ntua.gr/arrows/finalhb6a2.pdf>

66 Ibid

### 3.3 Vehicles and Equipment

Truck mounted attenuators (TMAs) mounted at the back of work trucks offer an extremely convincing means of protection from errant vehicles and construction workers, particularly during short duration works and when carrying out mobile lane closures – they are now mandatory in several EU Member States.



### 3.4 Informing the Road Users

Advance warning of upcoming road works including the preparatory phase can also help drivers avoid the area. Special care should be taken when the lanes for the start of the work are opened and closed. Overhead gantries can't be used on their own for the purpose of informing the road user on the approach to road works, signs must be used to support the messages as well.

The provision of information about prospective road works can also be combined with travel management information encouraging the use of alternative routes and the use of other modes of travel such as public transport to reduce the volumes of vehicles passing through the work zone. Risk can be avoided through timely information to other road users.

### 3.5 Case Studies

#### Ireland

In Ireland, the site is prepared in such a way that signs, lights and guarding are put in place in parallel. Irish authorities also communicate to the public that works will be starting in a number of weeks in order to influence road user route choice and travel planning. Regulations were amended in 2008, this also covered the specific need for training in deciding

what signs and barriers are required. One decision maker is nominated on the site in terms of setting and moving signs. Ireland also has a construction skills certification card including specific training for road works and more detailed supervisory level training available.

### Recommendations

#### Employers

- Ensure for co-ordination between the different contractors to take safety into account during the installation and removal phases.
- Ensure that there is a person responsible for safety on each site.
- The signs, markings and other safety measures used should point out clearly the travel paths to be followed by drivers. Existing signs, markings and safety devices should be replaced, covered or altered if they are inconsistent with those paths.
- Place RWZ signs at the normal signing height.
- Provide sufficient height to give appropriate visibility to oncoming drivers and, in urban areas, for passing pedestrians.



- Avoid the use of flashing lights in the RWZ in order to maintain their attention-raising effect.
- Ensured that safety barriers are visible, especially during the night-time and in bad weather. It is preferable to use barriers with visual (retro reflective) leading elements.
- Apply traffic markings using yellow retro reflective paint or tapes. The use of thermoplastics or cold plastic is not advisable because of the short time scale of the works.
- Use only well-maintained material at work zones. It should be ensured that signs and beacons cannot fall over, slip away or be blown away by the wind.
- Place signs and other traffic control devices moving in the direction of traffic flow (downstream)<sup>67</sup>.
- Use safety devices (such as barriers, TMA's) as described in the instructions accompanying these devices.

## Member States

- Ensure that legislation on work zone management includes co-ordination between the different contractors to take safety into account.
- Ensure that contractors also start to communicate with the road users about upcoming roadworks during the preparatory stage.

## Part 4 Management of the Work Zone

The aim of managing a work zone should be adopting measures that will achieve as close to vision zero for deaths and serious injuries. Timing for works is crucial, delays reserved to do works are too short in general and the offer to contractors of a possible bonus to finish within schedule can lead

to an additional risk. The next section covers safety of personnel, vehicles and equipment and the work zone infrastructure management. It also includes a section on communicating with the public and managing speed at work zones.

### 4.1 Safety of Work Zone Personnel

There are five key principles that should be respected to protect road workers cited by ARROWS 1998<sup>68</sup>:

1. Avoid exposure of workers to traffic.
2. Make workers visible to road users, both by ensuring adequate visibility for drivers and by providing suitable clothing for road workers.
3. Provide physical protection of workers from traffic. Even in short-term RWZs, buffer zones should be foreseen as a minimum
4. Protect workers from collisions involving works vehicles. The movements of works vehicles should be adequately perceived by workers.
5. Avoid excessive work hours. European and national legal requirements regarding work hours must be observed. Fatigue can contribute to increased risk for road workers.

One of the goals of safer work zone management should be to remove personnel from live traffic. The ideal situation is to work towards using machines using overhead gantries or vehicles without people in them. If workers are on the road then measures must be taken to protect them from moving traffic. This includes installing physical barriers and ensuring proper visibility and appropriate training. Personnel should work facing oncoming traffic, wherever practicable. The loading and unloading of tools and equipment should not be undertaken from the live traffic side of the vehicle. This also means undertaking rigorous planning. The Framework Directive 89/391/EEC should be the starting point. It states that employers shall, taking into account the nature of the activities of the enterprise, evaluate the risks to the safety and health of workers.

<sup>67</sup> Arrows (1998) <http://www.ntua.gr/arrows/finalhb6a2.pdf>

<sup>68</sup> <http://www.ntua.gr/arrows/finalhb6a2.pdf>

Rear end collisions are one of the main risks. Caution should be taken by drivers when reversing. Guidance recommends that drivers at worksites should find safe alternatives to reversing if at all possible and that they should walk around the vehicle and look for obstacles or hazards before moving. If reversing then, it is important that drivers reverse slowly and avoid reversing over a long distance. If possible, drivers should reverse or 'pull-through' into parking spaces rather than out of them<sup>69</sup>. Works vehicles should also include rear-view cameras or audio warning devices<sup>70</sup>.

Pointing out the risks of roadworks should encourage safer behaviour of road workers. Most road workers and other involved staff are not conscious of the high risks while working at a road work. This lack of awareness should be overcome by appropriate action at a general and a project-specific level<sup>71</sup>. Subsequent to the risk assessment evaluation the employer must implement the resulting preventive and protection measures, in particular the training needs required to the situation.

Giving clear instruction to personnel is a crucial part of managing personnel in a work zone. It is recommended to instruct all employees at the beginning of each road works project. Such instruction should incorporate adequate information about road works in general, as well as the specific project worked upon. All relevant information related to the operations should be shared between all parties concerned. This includes not only the workers directly involved in the maintenance task,

## 4.2 Vehicle and Construction Equipment

Vehicles and construction equipment should also be chosen adhering to safety criteria. The section above details the importance of ensuring that personnel are trained and able to use them. When employers are planning their work zone careful consideration is needed to determine in advance which equipment is needed.

but also those likely to be affected by it or who may be working in the vicinity<sup>72</sup>.

Preventative measures can be identified and implemented according to the results of the risk assessment. It is important to apply the principle of the prevention hierarchy (elimination-substitution-engineering-administrative controls-use of personal protective equipment) at all times<sup>73</sup>. Employers must ensure that personal protective equipment is supplied and used at work wherever there are risks to health and safety. Equipment should be used to manage a risk that cannot be adequately controlled using other measures such as engineering solutions. This includes using equipment that complies with the Personal Protective Equipment Directive (PPE) 1989/686<sup>74</sup>. Employers must make sure that PPE is properly assessed before use, is maintained and stored properly and that employees are provided with instructions on how to use it safely and that it is used correctly by employees.

In order to prevent a collision involving a road worker maximum effort must be made in ensuring that the worker and the equipment that they use makes them as visible as possible. Workers should wear high visibility clothing that is produced with high quality materials and comply with European standards (EN 4714 standard). One producer of construction equipment, Volvo, took the initiative of promoting the use of reflective vests amongst the operators of their machines by distributing vests to their customers.

According to ARROWS road equipment can be distinguished into three main sub-categories depending on the function of the measures:

- warning/information
- closure/guidance
- protection

69 Murray, W. Reducing Risks: improving the reversing safety of commercial vehicles. Public Service Review: Freight, Issue 9, 2005/6, [www.publicservice.co.uk](http://www.publicservice.co.uk).

70 Arrows (1998) <http://www.ntua.gr/arrows/finalhb6a2.pdf>

71 Ibid

72 <http://osha.europa.eu/en/publications/factsheets/90>

73 Ibid

74 <http://ec.europa.eu/enterprise/sectors/mechanical/documents/legislation/personal-protective-equipment/>

The first two sub-categories are, essentially, a complement to physical design and traffic control<sup>75</sup>.

### 4.3 Barriers and Markings

Generally traffic cones and barriers are used to demarcate the work zone but cannot be used as a barrier to protect workers. Good practice now aims to reduce as much as possible workers activity in work zones. This includes the point when workers are very vulnerable, especially when they are setting out road signs. This should be done by actively exploring alternatives to the placing of advance warning signs, cone tapers and lengths of cones for delineation of road works, by use of fixed and mobile gantry signs, high level nearside signs and use of lane-blocking vehicles.

Research also recognises that: ‘traffic cones and other guidance and delineation equipment (such as water-filled “barriers”) are no substitute for continuous physical protection measures. At worst, they simply lull drivers and the workforce into a false sense of security. Work should not even begin before all the foreseen safety measures have been installed’<sup>76</sup>.

Physical protection devices serve primarily to prevent the entrance of vehicles or pedestrians inside the work area and to reduce the consequences of collisions involving vehicles running off the roadway. ‘Those currently in use include temporary barriers, temporary crash cushions and truck-mounted attenuators (TMAs)’<sup>77</sup>. Temporary barriers are generally not fixed to the ground and are tested to

the same rigorous EN1317 standards as permanent fixtures (though with specific containment classes). Crash cushions are steel closure devices laid on the road surface at the entrance of the work area. This energy absorbing device offers protection in the case of head on collisions at work zone entrances<sup>78</sup>.

Impact attenuators are primarily used to protect road workers (SWOV 2010). Attenuators mounted at the back of work trucks offer an extremely convincing means of protection for errant vehicles and construction workers, particularly during short duration works and when carrying out mobile lane closures. TMAs are now mandatory in several EU Member States (e.g. TD 49/07 specification in the UK<sup>79</sup> and Belgium<sup>80</sup>).

Belgium has prepared specific instructions for signage and usage of TMAs on roads with a speed limit above 90 km/h. It states that no cones will be placed between the protection vehicle and the work zone and that protection vehicles will be used for protection only. For works on non-motorways on a lane with continuous traffic one protection vehicle (TMA) will be used and provided with proper signing and will be placed at 50 m in front of the work zone. On motorways two protection vehicles (TMA) will be used (MOV Instructions for use of TMA in MOW AWW 2009).

75 Arrows (1998) <http://www.ntua.gr/arrows/finalhb6a2.pdf>

76 EUROPEAN UNION ROAD FEDERATION (2007) Safety on motorway Work zones, Discussion Paper

77 EUROPEAN UNION ROAD FEDERATION (2007) Safety on motorway Work zones, Discussion Paper & Arrows (1998) <http://www.ntua.gr/arrows/finalhb6a2.pdf>

78 EUROPEAN UNION ROAD FEDERATION (2007) Safety on motorway Work zones, Discussion Paper

79 Ibid

80 <http://navb.constructiv.be/nl/Welzijnsinfo/Publicaties.aspx?Page=>

## 4.4 High Visibility Vehicles

Vehicles used by workers should also be made visible. Studies have investigated the relationship between vehicle and road worker conspicuity<sup>81</sup> (UK 2011). Visibility can also be achieved at a low cost by taking simple measures such as ensuring that vehicles are kept clean, especially the conspicuity markings and lights. Different studies showed that trucks can be rendered much more conspicuous by marking their sides and rear using retro reflective marking tape. Conspicuity marking tape is a high performance retro reflective tape which reflects most of the light falling onto it back towards the light source. The tape, mounted on the rear and sides of the vehicle,

enables the driver to identify the truck as an object on the road as well as its height and length. The truck is therefore made visible to other road users thereby reducing collisions, specifically rear and side impacts into large vehicles. The UNECE Regulation 104 sets out an international specification for retro reflective marking tape. Vehicles fitted with tape to this standard can be sold and circulate freely in UNECE countries. Another UNECE regulation (R48) sets out the requirements for the installation of lighting and light signalling devices on vehicles: this regulation currently allows (but does not mandate) the installation of conspicuity markings.

## 4.5 Infrastructure Measures during Work Zone Operation

Any change to a configuration of a road poses a risk. Changing the usual habits of drivers is an added risk such as for example narrowing lanes for road works. Thus, one of the main categories of safety measures covers physical design of road works. Taking account of maintenance should also be included as early as the design stage of all new infrastructure per se. Thus, including requirements such as the width of lane, emergency access, and the ability to open the median of the road every few metres should be part of all new infrastructure design.

In general, the basic safety principles governing the design of permanent roads should also govern the design of the RWZ areas. These aim at the provision of smooth transitions between the normal roadway and the work area, as well as at provision of adequate space (buffer area) for separating the route for traffic from the road works. Compliance with national Guidance and the EU Infrastructure Directive is paramount.

Elements of physical design include<sup>83</sup>:

- Lead-in taper and exit taper
- Longitudinal and lateral buffer width.

## 4.6 Work Zone Layout

The ARROWS project aimed to produce harmonised proposals for RWZ layouts for possible application across Europe. It found that: 'for long-term work zones there is a higher degree of convergence among European countries' practices; thus it was possible to prepare detailed layouts for each one of the four Areas (I, II, III and IV) defined along the work zone. Area I: advance warning area, Area II: transition area, Area III: activity area and Area IV: termination area. For long-term work zones on motorways (and dual-carriageway expressways), full-scale layouts can be produced by combining four basic elements: Area

I, Area II, Area III and Area IV. On the other hand, the diversity of national practices as regards layouts of other types of RWZs (short-term, rural-road and urban-road) did not allow for the same detailed treatment to be applied to those types'. However, Arrows recommends using the basic principles of long-term work zones using a simpler set of safety measures. For examples of the layouts see the Arrows Handbook Figures 2-41<sup>83</sup>.

Arrows further outlines six general prerequisites for effective roadwork measures. They should be:

81 Highways Agency, UK, Road Worker Conspicuity Daytime and Night Time [http://www.highways.gov.uk/knowledge\\_compendium/publications/F0751754DB1E406290A7ACB476DE3C0D.aspx](http://www.highways.gov.uk/knowledge_compendium/publications/F0751754DB1E406290A7ACB476DE3C0D.aspx)

82 Arrows (1998) <http://www.ntua.gr/arrows/finalhb6a2.pdf>

83 Ibid

1. Accurate. The presence of workers should be clearly indicated. They should provide all the necessary and critical information in a credible manner.
2. Properly-spaced and properly-timed. The sequence of RWZ safety measures should be positioned with enough separation to enable road users to process the messages, decide and react.
3. Perceptible and “readable”. The RWZ should be self explanatory; its layout should make it obvious how to interact with workers and other road users.
4. Comprehensible. Safety measures should make obvious to the road users how they should act. Nonverbal information messages are preferable to text.
5. Ensuring alertness. It is important to design the approach to the work zone so that drivers are notified that they are entering a road section requiring more “active” driving. The actual start and end of the work zone must be identified by appropriate elements (e.g. signs).
6. Reasonable. It is essential to prevent divided attention, distraction and mental overload of road users. A fundamental principle is to use “as few signs as possible but as many as necessary”.

#### Physical Design Check<sup>84</sup>

- The minimum distances between consecutive work zones should be such that the flow of traffic can return to normal between them. The separation should permit fast-moving traffic to overtake slow-moving vehicles so that platoons can be dissipated and traffic normalised.
- The basic safety principles governing the design of permanent roads should also govern the design of the RWZ areas. Geometry and traffic

control devices should be comparable to those for non-works situations. Where lane layout is altered it should provide radii that conform to the same criteria used for normal design.

- Frequent and abrupt changes in geometry, such as lane narrowing, dropped lanes or main roadway transitions requiring rapid manoeuvres, should be avoided.
- To minimise the extent of the disruption to traffic, the work zone should be kept as small as possible while providing adequate safety for workers.
- The length of work zones with narrowed lanes, i.e. with limited capacity, should be generally restricted so as to be acceptable by motorists.
- At work zones where congestion is likely, make provision for incident management, including having recovery vehicles permanently on site or available on immediate call-out for dealing with collisions.
- Make provisions for the safe operation of work or incident management vehicles, particularly on high-speed, high-volume roadways.
- Provide a roadside recovery area for emergency situations and disabled vehicles.
- Equipment, works vehicles and work zone material should be resistant to impact as far as practicable.
- Be especially mindful of obstructions on the central reserve - keep them as far away as possible from the edges of carriageways, and minimise interference with sight lines or with the safety fence.
- Establish well-defined buffer zones, free from workers, equipment and materials.
- Attention should be paid not only to the conspicuity and location of the devices but also to their design and material, to reduce the risk of serious damage in a collision. Do not place adverts in the vicinity of the work zone.

<sup>84</sup> Arrows (1998) <http://www.ntua.gr/arrows/finalhb6a2.pdf>

## 4.7 Information to the Public on Roadworks

Drivers should factor in possible road works when they are planning their journeys and try to avoid them. 'A timely warning about road works enables drivers either to cancel the journey, change the route or prepare themselves for delays'<sup>85</sup>. The media should be engaged in increasing public awareness of planned road works and to enable relevant actions. There is a need to influence rules existing in different countries on how information is given and received by the public ahead and during the operation. Site managers should prepare a communication campaign well in advance of the works.

The implementation in GPS navigators of live information on RWZs and cues offers a very important assistance in providing real time and reliable information to the public on the RWZs and their impact on the traffic flow.

## 4.8 Journey Planning and the Wider Road Network

In the UK, the Highways Agency has developed web-based information services for drivers on when and where road works are likely to be (see [www.highways.gov.uk](http://www.highways.gov.uk)), so that they can be planned for and avoided. Alternative routes should be communicated to the public as well. In some countries such as the Netherlands authorities will not allow works on the

## 4.9 Including Work Zone Safety in Driver Training and Education

Driving safely through road works should also be included in novice driver training and education. Training should focus on attributes that are most essential to recognise a work zone. The driving curriculum should also cover when to reduce speed, when to change lanes and to which direction. 'Training should also cover the possible negative consequences of speeding and close-following in a RWZ. Drivers should be made aware that the relative perceived benefits of speeding in saving time may be

Roadwork co-ordinators also need to make sure that they inform local residents, shop keepers and businesses as well as road users of upcoming roadworks. It is important that accessibility is assured as much as possible (pavements, keeping access private property, accessibility to public transport). Such information about the RWZs helps make the inconvenience they cause more acceptable<sup>86</sup>.

'It is important to design the approach to the RWZ so that road users are notified that they are entering a section requiring more "active" driving where utmost care is called for'<sup>87</sup>. Road users often disregard signs and speed limits at road works. The importance of obeying rules in work zones and the possible consequences of not doing so needs to be communicated more.

road unless they are closed completely to traffic. This is a clear way of reducing risk for road workers but comes with the need of managing traffic flows. In case of road closure or delays caused by roadworks with drivers avoiding the routes and taking other routes measures also need to be taken to consider managing the impact of transferred risk on adjoining roads.

tiny on a certain stretch of road'<sup>88</sup>.

Employers must take measures to reduce risk of their drivers driving for work and factor in systems to avoid risks and loss of time through roadworks. This includes checking the route in advance and avoiding planned road works. If the route does go through road works then extra journey time should be taken into account.

85 <http://www.hit.certh.gr/prevent/media/Deliverables/D2.pdf>

86 NAVB-CNAC (????) Witboek wegenwerken-Livre blanc Travaux de voirie

87 EUROPEAN UNION ROAD FEDERATION (2007) Safety on motorway Work zones, Discussion Paper

88 <http://www.hit.certh.gr/prevent/media/Deliverables/D4.pdf>

Advice to Drivers<sup>89</sup> once in the RWZ:

- Take extra care and keep to the posted speed limit.
- Get into the correct lane in good time – and avoid switching.
- Concentrate on the road ahead – not the road

works.

- Be alert for works traffic leaving or entering the road.
- Keep a safe distance – there could be queues in front.
- Observe all signs – they are there to help you.

### 4.10 Road User Testing of Roadworks

Through EuroTest/TAP, 18 FIA automobile clubs in 17 countries have been evaluating the quality and safety of mobility in Europe since 2000 including since 2005 tests of roadworks. The most recent roadwork evaluation was undertaken in 2010 with a review of roadworks in urban areas. Methodology was based on criteria in the ARROWS 1998 handbook and considered the most important safety issues along with questions regarding layout and quality of a roadwork site. All in all, around 180 inspection items were evaluated in 15 countries. Mostly the Eurotest evaluated that the result was very positive. Signposting and traffic routing were two areas profiled for improvement. Results can be viewed through a city and country by country breakdown and individual rating with evaluation per work site and some city comparisons were made<sup>90</sup>. Specific recommendations for authorities were extrapolated from the evaluation<sup>91</sup> as well as tips for different types of road users<sup>92</sup>.

**EuroTest 2010:  
57 City Road Works in 12 European Cities**

Road Work Zone	Signposting	Traffic guidance	Traffic flow	Information	Overall Rating	Road Work Zone	Signposting	Traffic guidance	Traffic flow	Information	Overall Rating
Weighting	15%	25%	35%	25%		Weighting	15%	25%	35%	25%	
<b>Vienna</b>						<b>Madrid</b>					
Handelskai	+	o	++	++	+	Plaza de la Habana	+	+	++	+	+
Breitenfurter Straße – 2	o	o	++	+	+	Galle de Serrano	--	o	o	+	o
Breitenfurter Straße – 1	++	+	o	++	+	Galle de Mejía Lequerica	--	--	++	--	o
Obere Donaustraße	+	+	o	+	+	Galle de los Hermanos Bécquer	--	--	--	+	+
Südtiroler Platz	--	+	o	++	o	Galle de Juan Bravo	--	--	--	+	--
Friedensbrücke	+	o	--	+	o	<b>Paris</b>					
<b>Brussels</b>						Place du Trocadéro et du 11 Novembre	--	+	++	o	+
Boulevard de la Grande Ceinture	+	++	++	+	++	Place Armand Tschanck	o	o	+	+	+
Boulevard Léopold III	o	+	++	++	+	Boulevard de Clichy	--	o	--	+	o
Boulevard du Souverain – 1	o	o	+	++	+	<b>Rome</b>					
Chaussée de Gand	--	o	++	+	+	Via Livorno	o	o	+	+	o
Boulevard Louis Mettenlé	--	--	o	+	o	Via Anastasio II	+	o	--	+	o
Boulevard du Souverain – 2	--	--	--	+	o	Corso Trieste	--	--	+	o	o
<b>Zurich</b>						Via Nazionale	--	--	o	o	o
Birmensdorferstraße	o	+	++	++	+	Viale del Colli Portuensi	--	--	o	o	--
Härtbrücke	o	+	++	++	+	<b>Luxembourg</b>					
Seebahnstraße	--	+	o	++	+	Rue de Beggen	--	--	o	--	--
Schaffhauserstraße	o	o	--	++	o	<b>Amsterdam</b>					
Pfingstfeldstraße	--	o	--	++	o	Gooseweg	+	+	++	++	+
<b>Berlin</b>						Kreisverkeer Noordzijde – Oostvoever	o	o	++	++	+
Invalidentstraße	o	+	++	++	++	Rokin	++	o	+	+	+
Taentzienstraße	+	+	++	+	+	Johan Huizingalaan	o	--	++	+	+
Karl-Marx-Allee	o	o	++	+	+	Burgemeester de Vlugtlaan	--	o	+	+	o
Spandauer Damm	--	--	o	++	o	<b>Ljubljana</b>					
Wollankstraße	o	o	--	++	o	Dalmatinska Ulica	+	o	++	+	+
<b>Munich</b>						Želazna Cesta	o	o	++	o	+
Schleißheimer Straße	+	+	++	+	+	Pojanski Nasip	o	--	+	o	+
Landsberger Straße	o	+	o	++	+	Slovenska Cesta	--	+	o	o	o
Luisë-Kieselbach-Platz	+	+	--	++	+	Vojkova Cesta	--	--	o	+	o
Einsteinststraße	+	+	o	+	+	Trubarjeva Cesta	++	+	--	o	--
Georg-Brauchle-Ring	o	+	++	--	o						
<b>Barcelona</b>											
Ronda del Guinardó	+	+	++	++	++						
Avinguda Meridiana	+	+	++	+	+						
Avinguda del Doctor Marañón	o	o	++	+	+						
Ronda del General Mitre	+	+	o	+	+						
Carrer del Comte d'Urgell	--	o	--	+	o						

++ very good    + good    o acceptable    -- poor    -- very poor

### 4.11 Signage

One of the ways of communicating with the public is signage. Work zone co-ordinators also have a legal duty to comply with Directive 92/58/EEC on safety and/or health signs ensuring that signs are in place where hazards cannot be avoided or reduced. The legibility of signs should be increased using pictograms and messages presented on conspicuous signs. The sequence of RWZs information devices should be positioned with enough separation to enable road users to process the messages, decide and react. Also particular care should be taken to address the risk of reduced work zone visibility at

night, for instance through systematic street lighting. Signage should follow the evolution of time and space- and be removed when and where they are no longer needed<sup>93</sup>. Overlapping with existing or conflicting signs must also be avoided.

There are various forms of guidance or legal requirements set at a national level that set out how road work signage should be undertaken. One reoccurring question is the extent to which road work managers are using signs. In the planning and installation phase they should make sure that the

89 UK Highways Agency Public Information

90 <http://eurotestmobility.com/eurotest.php?itemno=381&lang=EN>

91 <http://eurotestmobility.com/eurotest.php?itemno=377&lang=EN>

92 <http://eurotestmobility.com/eurotest.php?itemno=383&lang=EN>

93 EUROPEAN UNION ROAD FEDERATION (2007) Safety on motorway Work zones, Discussion Paper

level of signage gives the driver the information they need to know what they are being asked to do but without overwhelming them. Research shows that 'a large number of signs and devices at RWZs does not necessarily lead to better road user behaviour'. A reasonable hypothesis may be that the more

#### 4.12 Using ITS in informing drivers

'Infrastructure to Vehicle' ITS can help to inform drivers about upcoming RWZs and speed limits. Variable message signs (CMS/DMS/VMS) are message boards placed along roadways that notify travellers of incidents, travel time information, construction/road closures, and other potential hazards in or around the work zone.

The use of variable message signs is now in place. For example, if traffic is extremely slow in the work zone, a variable message sign upstream of the work zone might warn of a 10-minute delay ahead; a second sign might then warn drivers to slow to 55 km/h. If traffic speeds decrease further, indicating worsening congestion, the system would automatically change the signs to indicate an even longer delay and advise

#### 4.13 Speed Management

Managing speed should be the number-one concern at road works. Surveys show that a vehicle's speed in the activity area (where work is going on) seems to be related to its initial speed when entering the RWZ<sup>97</sup>.

Speed limits should be credible. If road users pass through a work zone and do not see activity during several days they can be tempted to neglect the imposed speed limits (NAV-B-CNAC Belgian White Book). In the Netherlands there is good experience with signing to inform users why a road is closed without visible activity. Such signing apparently increases the acceptability of speed limitations. 'Also there the Dutch Ministry of Transport has introduced new, more credible speed limits for roadworks on

devices, the greater risk that there will be devices missing, misplaced, out of order, misunderstood or not detected<sup>94</sup>. However drivers will decide whether or not to comply with a warning, or generally to show safety behaviour-if the perceived benefits of compliance outweigh the costs<sup>95</sup>.

of slower speeds ahead. The signs can also be used to suggest alternate routes or tell drivers to tune into a radio station which broadcasts further advice. To emphasise the timeliness of the messages, each sign can also display the time the message was posted. Drivers armed with information on traffic ahead are better prepared for changing traffic conditions and thus more likely to have a safe trip. The economic benefits of reducing delays and improving safety at work zones can outweigh the costs of the system by a factor of six or more<sup>96</sup>. Extending this to informing the driver via their in-vehicle ITS systems such as for example navigation devices can also be a way of directing the information. In a further stage vehicle to vehicle ITS can also be used to inform drivers of road works up ahead.

the motorways. The speed limit can be differentiated across lanes and for time of day<sup>98</sup>.

Speed limits in work zones must be set for protection of the workers and also of the drivers passing through them along with the requirement of managing traffic flows. A balance should be achieved.

At present there is an ongoing challenge in reaching the correct balance between considering road worker safety and managing traffic.

There are several reasons why speed limits at work zones should be lower than at non-work sections. Important factors in determining appropriate speed limits are:

94 <http://www.hit.certh.gr/prevent/>

95 Ibid

96 Ibid

97 <http://www.hit.certh.gr/prevent/media/Deliverables/D2.pdf>

98 [http://www.swov.nl/rapport/Factsheets/UK/FS\\_Road\\_works.pdf](http://www.swov.nl/rapport/Factsheets/UK/FS_Road_works.pdf)

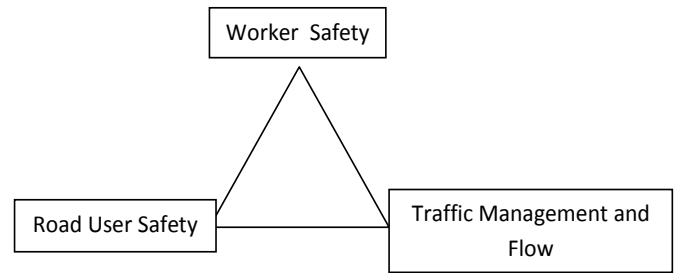


Adjustment to reduced roadway standards: Narrowed lanes, deviations (e.g. to/from the contra flow) or reduced shoulders are common changes in highway geometry at RWZs, necessitating lower speeds.

Protection of road workers: Even if there is no effect on the geometric standards of the roadway, the presence of workers calls for a reduction in traffic speeds.

Queuing: On motorways and other higher-volume roads, lane closures may result in queuing, which could increase the probability of rear-end crashes.

Commonly, nation specific maximum speed limits for work zones are defined. These can be adjusted downwards if necessary for safety reasons<sup>99</sup>.



### 4.13.1 Informing the Public of Speed Limits

According to studies carried out on drivers, 'speed behaviour at work sites is largely dependent on the road signs and variable message signs (VMS) they are confronted with'. Also that, 'the likelihood that drivers will slow down when they recognise a sign increases when the signs become more specific'<sup>100</sup>. There is a need for better means of reinforcing the lower speed limit message other than with just static signs. Measures can include providing information

to the driver via other media such as the radio and reduced limits set by law. The way the road lay out is designed and set can also reduce the speed. The government in Germany launched in 2010 a new way of informing road users via CB radios which broadcasts: "warning dangerous road section"<sup>101</sup>. The system is mainly targeting HGV drivers and is broadcast in seven languages. CB radio is still commonly used amongst HGV drivers.

### 4.13.2 Speed Enforcement at Work zones

Another measure which ideally should go hand in hand with public information to the driver to reduce the speed is the support of a physical Police presence undertaking speed enforcement checks. Due to the special nature of the work zone (e.g. limited space, difficult or even impossible to access) Police officers should be educated and trained on how and when to take measures with regard to violation of traffic rules within the work zone<sup>102</sup>. In Italy "Autostrade per l'Italia S.p.A." has been working to reduce roadworks related accidents by means of different measures including the use of mobile laser control (autovelox) for speed control in co-operation with

the motorway Police.

Speed enforcement can also be managed with fixed automated safety cameras including section control which is a method of speed enforcement involving a series of cameras installed over a stretch of road. An image and data are recorded for each vehicle as they enter and leave two points in the system (a section of road). 'Section Control is an efficient speed enforcement method, leading to reductions in speeds across entire sections of roads and reductions in the number of collisions and casualties'<sup>103</sup>. Enforcement of speed limits via average speed cameras is one of the most effective ways of reducing vehicle speeds and

99 Arrows (1998) <http://www.ntua.gr/arrows/finalhb6a2.pdf>

100 EUROPEAN UNION ROAD FEDERATION (2007) Safety on motorway Work zones, Discussion Paper

101 [http://www.bmvbs.de/SharedDocs/DE/Pressemitteilungen/2010/mehr-verkehrssicherheit-auf-autobahnen-als-erstes-bundesland-warnt-nordrhein-westfalen-flaechend.html?linkToOverview=DE%2FPresse%2FPressemitteilungen%2Fpressemitteilungen\\_node.html%3Fgtp%3D36166\\_list%25253D16%23id24122](http://www.bmvbs.de/SharedDocs/DE/Pressemitteilungen/2010/mehr-verkehrssicherheit-auf-autobahnen-als-erstes-bundesland-warnt-nordrhein-westfalen-flaechend.html?linkToOverview=DE%2FPresse%2FPressemitteilungen%2Fpressemitteilungen_node.html%3Fgtp%3D36166_list%25253D16%23id24122)

102 <http://www.hit.certh.gr/prevent/media>

103 [http://www.etsc.eu/documents/copy\\_of\\_copy\\_of\\_Speed%20Fact%20Sheet%205.pdf](http://www.etsc.eu/documents/copy_of_copy_of_Speed%20Fact%20Sheet%205.pdf)

achieving speed limit compliance in the UK. Average speed cameras have so far been used effectively for major (long term) road works. Research into the use of average speed cameras in short term (overnight) works carried out on behalf of the Highways Agency showed that their use is practicable and the cameras do achieve a statistically significant reduction in traffic speed.

Another tool to be considered is that of applying stricter penalties in case of a speeding offence committed in a work zone. This is currently the case in the Netherlands and in USA already and has been debated in the UK.

Immediate feedback is another way of informing drivers of the speed they are travelling at. Radar speed monitoring/display units can also be used. This is a portable system that can be mounted on a sign or located on a portable trailer that uses radar to measure vehicle speed and that informs motorists of their speed. In 2006, the Dutch Ministry of Transport started a new trial to reduce the speed at road works. Road users were given immediate feedback on their speed, while their vehicle registration number was shown. This direct feedback appeared to result in speed reduction<sup>104</sup>. Unreasonably low speed limits should always be avoided.

Traffic and Speed Management key issues are:<sup>105</sup>

- Try to maintain the number of lanes, using altered layout, narrow lanes, contra-flow or added lanes. If lanes have to be closed, do this as little as possible, leaving at least one lane in each direction, and using narrow lanes or altered layout as far as possible to avoid flow restrictions and diversions. If you have to close a lane on motorway or dual-carriageway road, it is preferable to close the fast lane(s) first and conduct traffic through the slow lane(s).
- If the work zone is short-term and the traffic volumes are low, alternate one-way operation may be used, with either fixed priority or traffic lights (but not with flagging).
- If some limited extra-capacity is needed, diversions to alternative routes may be used, provided that these routes can accommodate the new traffic and are carefully controlled.
- Design the traffic control plan in such a way as to help drivers to make proper choices rapidly, reinforce critical information without being excessive, appear credible, and avoid conflicting information. Traffic management systems should follow the evolution of the works in time and in space, and be removed as soon as they become unnecessary.
- Separate decision points for the driver.
- Minimise any unavoidable reduction of forward visibility, and provide proper warning. Use signing, markings and safety devices that are consistent with intended travel paths. In long-term work zones, replace, cover or alter existing signs, markings and safety devices that are inconsistent with those paths. In short-term work zones, use mainly devices that emphasize the appropriate path. Make realistic estimates of the approach speeds, and choose realistic and justifiable speed limits, to be supported by accompanying measures (reduced width, police presence).
- Do not prolong low speed limits through long stretches.
- Do not position speed limits signs too far in advance - drivers may consider them premature and ignore them when reaching the critical point.
- An emergency plan should be part of the design. It should describe the procedures in case of collisions and define the required actions to be taken (e.g. emergency vehicles and shelter possibilities).

104 [http://cardweb.swov.nl/swov/website\\_uk\\_detail.html?Zoek=Zoek&display=1&pg=q&q=20070567&start=0](http://cardweb.swov.nl/swov/website_uk_detail.html?Zoek=Zoek&display=1&pg=q&q=20070567&start=0)

105 Arrows (1998) <http://www.ntua.gr/arrows/finalhb6a2.pdf>

## 4.14 Case Studies

### Belgium White Book

In Belgium the National Committee for Safety and Hygiene in Construction NAVB/CNAC is an organisation that promotes safety and security in the construction sector. They have also developed measures targeting the specific subsector of road works. They have developed a simple White book on Road Works addressing the ten main safety problems and solutions. These include: co-ordination, timing, signalling, wider safety zones, regulation compliance, limited experience of the safety co-ordinator, speed limitations, public private partnerships, social effects and vandalism. The first point they stress is co-ordination between road works and that, if different

works can be combined during a limited period of time, it will probably be more accepted for road users if a section is completely unavailable during this period. They raise the need to ensure that traffic trying to avoid road works on one site may end up in another road work site. The White Book also stresses the legal obligation in Belgium for the appointment of a safety coordinator as in most road works the contractor is working with subcontractors and the appointment of a safety coordinator is mandatory. Safety should also be included in the training and existing certification scheme for safety co-ordinators.

### Worker Safety Management System for New Road Construction Projects-Portugal

The Portuguese Road Institute has developed and implemented a worker safety management system for new road construction projects reviewed by the EU OSHA<sup>106</sup>. This has led to a documented collision reduction rate of between 30 and 40%; moreover the seriousness of collisions and the number of days of absence were reduced. The aim of the system was to provide a common safety framework for all parties involved in a road construction project. The approach is to systematically establish the health and safety obligations and responsibilities of each party. Contractors also have to have health and safety

systems in place that comply with the IEP's own management system. An effective monitoring system was set up. A safety culture was promoted within the organisation with contractors. The system was also integrated with other management activities such as quality assurance and cost-effectiveness. Part of the implementation and promotion of the new system was training of all of IEP's own employees and different participants in the construction process. To support the introduction of the management system a comprehensive manual was introduced.

### Increasing Road Worker Safety in the Netherlands

In The Netherlands, there are non-legally binding guidelines for uniform preparation, indication and signalling of roadworks<sup>107</sup>. According to these guidelines, the indications of the work zone and the guidance of traffic must be simple and clear, thus both ensuring that the road users are aware of the roadworks ahead in time and that they know what is

expected of them. Furthermore, sufficient distance or a barrier between road workers and traffic is required. The Netherlands also has legally binding requirements for sign and layout of work zones on national roads<sup>108</sup>. However, an evaluation of 50 roadworks locations<sup>109</sup> shows that only few locations follow the guidelines completely. A 2009 Labour Inspectorate evaluation

106 [http://osha.europa.eu/fop/netherlands/en/goodpractice/PDF%20map/bouw2\\_8.pdf](http://osha.europa.eu/fop/netherlands/en/goodpractice/PDF%20map/bouw2_8.pdf)

107 CROW (2005). Werk in Uitvoering; Diverse richtlijnen. Publicatierreeksen 96a en 96b. CROW kenniscentrum voor verkeer, vervoer en infrastructuur, Ede. In SWOV 2010

108 AVV (2005). RWS-richtlijn voor verkeersmaatregelen bij wegwerkzaamheden op rijkswegen. Directoraat-Generaal Rijkswaterstaat, Adviesdienst Verkeer en Vervoer, Rotterdam. In SWOV 2010

109 Weijermars, W.A.M. (2009). Verkeersonveiligheid bij werk in uitvoering, deel III en eindrapportage. R-2009-4. Stichting Wetenschappelijk Onderzoek Verkeersveiligheid SWOV, Leidschendam.

showed that the road worker was in danger of being crashed into by a vehicle at almost 30% of the 223 inspected locations<sup>110</sup>. Furthermore, in 21 situations, risks were so high that the work had to be stopped.

During 2006 and 2007 a study was undertaken in the Netherlands in order to better understand the crash risk for road construction workers during road

works. Based on the outcomes of the study a collision model was developed for investigating collisions and safety promotion materials were constructed for road workers. A video was prepared to make workers and managers aware of their own behaviour. The video uses actors, but the situations were based on actual observations. Also, stickers were prepared for the types of behaviour that can prevent collisions.<sup>111</sup>

### Evaluation of the E411 and E25 Roadworks Belgium 2004-2006

A Case Study on the E411 and E25 Roadworks prepared by the Belgian Road Research Centre raises some important findings on improving road safety at road works<sup>112</sup>. The road works were being undertaken over a three year period and involved long-term operations on significant sections of two key routes. The report provides an abundance of data pertaining to traffic and speed, both before and during the works. The roadworks were ambitious, aiming to repair 127.5 km in the province of Luxembourg (south-east of Belgium), between March 2004 and October 2006. Rehabilitation was considered essential in view of the worrying state of the road surface, severely affected by the “punch-

out” phenomenon. The thorough report concluded with several key findings that can provide some useful lessons for others on how to conduct road works safely. Firstly, that it is essential that sufficient care is taken to ensure that lanes are clearly and unambiguously defined, particularly when using narrow lanes. Secondly, that running with a single lane in each direction can be a good option from a safety perspective provided sufficient capacity is maintained. Thirdly, that it is vital to monitor collisions at the commencement of the works, so that any problems can be identified and rectified quickly and finally, that the use of very long stretches of works can exacerbate delay problems due to collisions and incidents.

### UK Campaign on Speeding: Difference when travelling at 50 to 70 mph at Roadworks

The Highways Agency, supported by DfT’s Think! Road Safety campaign, developed two DVDs (with supporting materials) highlighting the need to slow down and respect speed limits at road works. The first, entitled “Respect”, compares the responsibility of the road worker with that of other professionals such as teachers and doctors whose roles are also to make our lives more informed, reliable and safe<sup>113</sup>. The consequences of not respecting road workers (by not respecting speed) are made clear and this is then translated to other professions with shocking outcomes. The second, “5 Seconds”, covers the direct

impact of speed and the different consequences of travelling at 70mph and at 50mph<sup>114</sup>. A speed restriction of 50mph at road works will mean that travelling a quarter of a mile to pass the road works will take 18 seconds. Travelling at the maximum speed of 70mph, to travel the same distance it will take 13 seconds - the difference being only 5 seconds. The DVD features two business colleagues who are on their way to an important presentation but are already running late. We see how a decision made to save just 5 seconds by speeding, can change lives when an incident occurs.

110 Dutch Labour Inspectorate (2010). Risico’s bij werken aan de weg. Inspectierapport 2010. Arbeidsinspectie, Utrecht. In SWOV 2010

111 Venema and Brinkhuis (2008) TNO Quality of Life, Increasing Road Worker Safety in the Netherlands

[http://www.virtualriskmanager.net/main/aboutus/niosh/poster\\_venema-anita\\_1.pdf](http://www.virtualriskmanager.net/main/aboutus/niosh/poster_venema-anita_1.pdf)

112 [http://www.brcc.be/pdf/publications/e41\\_05.pdf](http://www.brcc.be/pdf/publications/e41_05.pdf)

113 <http://www.highways.gov.uk/knowledge/20639.aspx>

114 <http://www.highways.gov.uk/knowledge/20639.aspx>

## UK Highways Agency Health and Safety Toolkit

The Highways Agency has also developed a Health and Safety Toolkit as a means of identifying the many good practices, innovations and ideas which can contribute positively to workforce health and safety that are currently being used on the network. The toolkit aims to act as a vehicle to communicate and share good practice with interested stakeholders to further drive improvements across the industry. The scope of the toolkit covers the four key project stages:

design, maintenance, construction and demolition. Examples so far include the 'Quick moveable barrier' which provides safety to site staff working within temporary lane closures, as opposed to working on live road areas with conventional cones. Other examples include 'Warning Devices for Overhead Structures', 'Mechanical Gully Cover Lifter' and 'Mechanical Kerb Lifter'.

## UK Road Workers' Safety Forum

The Highways Agency also plays an active role in the "Road Workers' Safety Forum" (RoWSaF). The Forum has the sole aim of improving safety of road workers and road users while travelling through road works. RoWSaF has supported the development of a range of information DVDs, media resources and printed materials for use by companies and agencies. RoWSaF also has a Trials Team which undertakes

trials and evaluation of innovative techniques and equipments aimed at improving the safety and welfare of operatives working on the Highways Agency's road network. Trials investigations have included "sequentially flashing road danger laps", "remotely controlled signs", and "vehicle mounted VMSs for incident management".

## Recommendations

### Employers

- Make sure that PPE is properly assessed before use, is maintained and stored properly and that employees are provided with instructions on how to use it safely
- Inform the public of road works via media and websites: including alternative route information.
- Ensure high visibility of workers 24 hours a day even in adverse weather conditions.
- Enforcement is considered essential; it should be ensured that the assistance of the police can be provided as necessary<sup>115</sup>.
- Park maintenance vehicles safely; work zone delineators should be used around the vehicle.
- Cover RWZ speed restrictions that do not apply outside working hours (for example, in cases where a work zone does not influence traffic flow when not in operation).
- Keep the RWZ clean during the work.
- Replace traffic signs, beacons etc. (that are moved for the purposes of work) to their original position afterwards.
- Remove safety measures when works are complete; abandoned RWZs should be avoided as far as possible.
- Remove signs and other traffic control devices moving against the direction of traffic flow (upstream).
- Recognise that at a general level, appropriate education and training of site personnel at all levels on RWZ safety issues can contribute to the understanding of safety aspects as an object of responsibility, as well as to ensuring the competency of the involved personnel in undertaking their responsibilities on the site. Education and training should not be given "once and then never again"; it has to be repeated and updated. It could be incorporated into certification programmes at a national level.
- At a project-specific level, make the instruction of site personnel an important component of the RWZ implementation process.

115 Arrows (1998) <http://www.ntua.gr/arrows/finalhb6a2.pdf>

## Recommendations to Member States

- Comply with requirements set out in the Infrastructure Safety Directive especially adopted guidelines on temporary safety measures applying to roadworks<sup>116</sup>.
- Recognise that the decrease of traffic congestion from RWZs will have a positive impact on safety, save costs and reduce CO2 emissions.
- Prioritise Labour Inspectorate to enforce legislation protecting safety of road workers' publicise results and give feedback on preventative measures for managing risk to employer carrying out roadworks.
- Increase enforcement of specific laws and set appropriate penalties at RWZs

## Recommendations to the EU

- Review progress made by Member States in implementing the Infrastructure Safety Directive's guidelines on temporary safety measures, as applied to roadworks, and support the exchange of best practice.
- Consider the opportunities to work towards further harmonisation in terms of standards on design of road works (design, signing and protection)<sup>117</sup>.

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*Kris Redant, Paul Mitchell, Francesca La Torre, Anita Venema, Will Murray, Dietmar Otte, Matthew Heppleston, Deirdre Sinnott, Damien Tillet, Thierry Reip, Rik Nuyttens, Luca Felappi, Jacqueline la Croix, Maria Cristina Marolda*

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<sup>116</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:319:0059:0067:EN:PDF>  
<sup>117</sup> PREVENT 2003

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# "PRAISE": Preventing Road Accidents and Injuries for the Safety of Employees

MAY

2011

FACT SHEET

6

FACTSHEET 6



PRAISE Factsheet 6  
Safety at Road Work zones

## ETSC Interview Damien Tillet of ASF (Autoroutes du Sud de la France)

ETSC's PRAISE project, "Preventing Road Accidents and Injuries for the Safety of Employees", aims at mobilising knowledge needed to create work-related road safety leadership. This Fact Sheet complements the PRAISE Report "Road Safety at Work Zones" published in May 2011 and looks specifically at the approach of Motorways of the South of France to ensuring safety of their employees and other road users during works on their network.

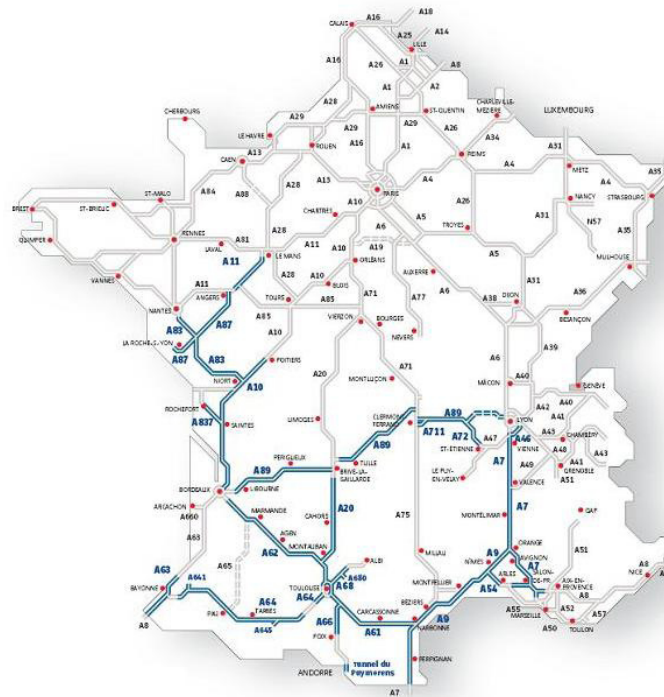
<b>Introduction to ASF</b>	<b>2</b>	<b>Other Road Users</b>	<b>6</b>
<b>General Road Safety at ASF</b>	<b>2</b>	<b>Lessons</b>	<b>6</b>
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## Introduction to ASF

### What is the history of the company, its functions and its current role?

ASF was founded in 1957 and now operates 2700 km of motorways on behalf of the State. ASF has become the leading motorway network in France and the second largest in Europe. Occupying a strategic position in mainland France along the Le Mans – Lyon – Aix en Provence corridor, it benefits from the momentum of the economically vibrant urban areas of southern France. It connects the Iberian Peninsula with Northern Europe and carries major European business and tourism flows as well as a large amount of regional traffic.

The company aims to offer expertise in operating motorways across a variety of environments. ASF's first priority is to do its utmost to ensure smooth and safe traffic flow under all circumstances. It has a variety of missions: to facilitate the safe movement of people and goods, to build safe and durable infrastructure that respects the environment and the surrounding communities and to take part in regional planning and in the development of regional economies and tourism.



## General Road Safety at ASF

### 1. How are safety decisions taken at ASF?

Decisions are often taken by three people: two operating system directors (Southeast and Southwest networks) and a Prevention/Safety Director. The Prevention/Safety Director proposes a general policy and a methodology to the other directors who need to approve the approach.

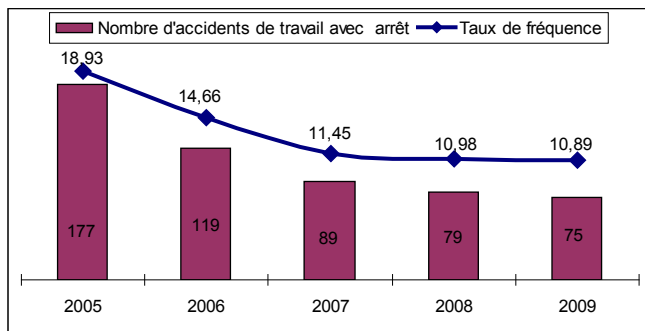
### 2. Can you provide any figures tracking the improvements in your safety performance over the years? What are the trends or changes you can identify?

Safety has been improved primarily through the establishment of procedures and rules and the extended use of safety training. This has significantly reduced the number of occupational incidents and collisions.

For ASF, the number of work-related collisions involving lost time has been falling during the last 5 years from 177 in 2005 to 75 in 2009.

Our approach includes the definition of a safety policy with an annual action plan aimed at delivering actions in different areas including safety management, communication and road risk.

Currently, it is more difficult to modify the safety policy as it relates to behaviours: We need to change people's behaviour and habits in order to make further progress. This is what we aim to do but it takes time.



### 3. Do you consider that there is a solid Business Case to invest in road safety? Why?

Safety is always a good investment, including safety on the road. This helps prevent occupational incidents - incidents that can be serious or even fatal.

### 4. Do you think that companies who have employees on the roads have a duty to go beyond the legislation regarding traffic safety of the country in which they operate?

The physical safety of employees is a concern that is central to the culture of any motorway operator. Employee safety is a constant priority for ASF, and our objective is nothing short of zero collisions. Indeed we must go beyond the regulatory requirements and do everything possible to avoid collisions. This applies in particular to the following areas:

- Providing strict procedures and internal rules in relation to safety in a manner that is precise and as exhaustive as possible.
- Adapted training that is well scheduled and programmed.
- Implementing an internal working group to ensure monitoring and management of feedback.
- Exchanging and sharing of best practices between companies.

## Safety and Work zones

### 1. In the experience of ASF, are road work zones regarded as problematic in terms of safety?

Construction zones are heightened danger areas on our roads for both our employees and road users working and travelling in the vicinity. As a result, exposure to risk is an important consideration when installing road works, markings or construction areas. The responsibility of other road users is also highly important - a distracted or drowsy customer could hit a worker.

Our employees carry out works aimed at making our network a safer place. We advise those using our roads to avoid putting them in danger by driving safely: lowering their speed as soon as they see workers in yellow and not driving too close to them.

ASF has organised a variety of workshops to raise road users safety awareness including introduction to first aid, reflex testing and tyre pressure checking. "Roll-over" simulators enabled drivers and passengers to appreciate the importance of fastening front and rear seat belts. The overall aim was to encourage drivers to change their driving habits, ease off the accelerator and adapt their driving to the road conditions.

### 2. Do you collect data tracking road maintenance related collisions and, if so, what does this involve?

All accidents involving staff in highway traffic are identified and analysed. A survey is also carried out for all companies using the highway through the ASFA network (Association of French Motorway Companies)

To ensure that its customers can travel safely, ASF's surveillance and response system is operated 365 days a year. Regional control centres and the national ASF traffic control centre, analogous to the control tower at an airport, track all ASF motorway corridors minute by minute. Every event, however minor, is reported. The control centres can sound the alarm at any time to assist a customer or dispatch an ASF team or an emergency service response team to the site. Thanks to this ongoing vigilance, the motorway

is now four times safer than other highway networks. In addition, the vast majority of ASF's response vans have been equipped with an innovative road sign system for use in case of accident or incident. It is in full compliance with the recommended road safety rules.

### 3. What do you see as the main safety issues around road work zones?

Failure of road users to respect speed limits at construction zones, distracted drivers, inattention and drowsiness are the main risks at road works.

### 4. Do you have specific procedures relating to safety and road maintenance? If so, what do these entail?

There are specific rules for the installation and removal of work zones. In addition all staff authorised to intervene are specifically trained in this area of expertise for several weeks.



## Employee Safety

### 1. Approximately how many road workers do you employ and how many road works operations do they carry out annually?

Approximately 1000 employees are in charge of managing such works, highway patrol and accident management. This represents more than 5,000 work sites annually.

### 2. What type of road works are involved (mobile, short-term, long-term)?

These three types of construction are represented:

- sites called "day-to-day" which are from 1 to 5 days
- sites known as "major repair" which are 1 to 2 weeks
- specific sites such as for "horizontal markings" which are undertaken by mobile teams

### 3. Is the safety of maintenance workers considered at the road design or planning stage? If so, how is this done?

For the important larger projects, the safety of workers is taken into account upstream in the process when the site design and planning work is taking place. For the 'current/basic' sites there is no reflection upstream, however, the physical safety of employees is a concern at all times.

### 4. How is the safety of employees considered in ASF's approach to worksite management?

Employee safety is taken into account when defining the phases of work. A specific working group also improves practice by sharing and evolving procedures whenever necessary. In addition to measures taken as regards equipment (deployment of automatic signs on central reservations) or raising awareness (an accident prevention portal on the company intranet), we are also continuing our collision prevention and safety training campaign

### 5. Do you provide specific training for employees in relation to how to carry out roads works safely? If so, what does training involve?

There is specific training including frameworks related to the different types of interventions required (emergency response and intervention on the ground), the different types of material used and the use of specific devices such as FLR. FLR, or 'Flèche Lumineuse de Rabattement' in French, is a signaling device in the form of illuminated arrows, mounted on a vehicle for informing road users of carriageway closures. The device can be set up in 15 seconds and avoids the need to put in place a wedge of cones that

would expose workers to risk for several minutes.

These training courses include theoretical and practical simulation exercises and a period of training with tutorials.



### 6. Are employees certified? If so, what type of certification is used?

There are three different types of certification according to the required task and its location on the road: one who enters the road way to stop traffic will have more training than a person brought to intervene only on the emergency lane.

For example, our “route safety” certification for motorway workers and patrol officers is very much like an in-house driving licence. The course is a combination of theory and practice, which trains and tests employees in their grasp of safety recommendations and practices when using the motorway on professional journeys.

### 7. What has been the opinion of employees on your approach to safety at work zones? Are they supportive? Did you consult with them?

Employees are very sensitive to safety on construction sites. They find that ASF is investing in both human and financial resources to improve safety in relation to construction sites. Employees are regularly consulted through feedback

groups (Prevention Intervention Safety Track) and social dialogue is at the heart of our agreements.

### 8. How do you feel that you perform compared to competitors in terms of the safety of your on road employees?

ASF is one of the motorway companies that are proactive in the area of road safety and that always cares for the safety of its employees. The creation of the foundation ‘Vinci Highways for responsible driving’ (ASF is a subsidiary of VINCI Auto routes) highlights the energy deployed by ASF to continually improve the safety of its personnel and its customers.

### 9. Is there any specific equipment that you feel makes a significant contribution to safety at work zones?

ASF has established more than 700 pre-sequenced static signs on the ground, which means more than 700 areas where signs remain in place permanently but can be rotated to the left or right. Thus, where motorised pre-sequenced static signs are present, there is no more need to manually carry signs and, in particular, no need for employees to cross the lanes of traffic.



## Other Road Users

### 1. Speeding is recognised as a critical issue both on roads generally and at around work zone areas. Do you take specific measures to deal with this?

With regard to speeding around work zones, police conduct regular speed checks in these areas. The Association of French Motorway Companies also conducts information/awareness campaigns on the issue. We also have specific messages for VMS (Variable Messaging Signs) on the topic.

Since 2004, ASF has been experimenting with dynamic speed regulation on the A7 motorway in order to optimise traffic flow during peak periods. The innovative system has produced good safety, traffic flow and comfort results, reducing the number of accidents by 20 to 30% and achieving a 20% gain in travel time during periods of traffic congestion.

Information is provided to customers via variable message boards, which are located above traffic lanes and keep motorists abreast of traffic conditions and travel times in real time. Additional information is provided on Radio Traffic FM 107.7. Message boards are also installed at slip-roads to give motorists traffic information and safety advice before they enter the motorway.

### 2. How do you communicate with road users about road maintenance?

Specifically in work zones there are information panels indicating:



- the nature of the site
- the expected duration

There is also regular information made available on flyers and in local newspapers for larger works projects. As stated above, we also have specific Variable Message Signs.

### 3. Do you think road users are aware of the added risks at locations with road works? Do you have ways of trying to improve awareness?

VINCI is developing synergies between its different motorway networks with the aim of offering customers new services and making motorways safer and more environmentally friendly. As a way of encouraging its customers to adopt safer and stress-free driving habits by taking regular breaks, every year at peak holiday times ASF organises events at its service and rest areas. In 2008, we expanded our summer programme of events to include more emphasis on safety and environmentally responsible behaviour.

## Lessons

### 1. What have been the lessons learnt and what would you advise to other companies to do in terms of improving safety at road work zones?

It is very important to listen to the staff as the company can benefit from the experiences of its employees. In addition we must look for areas of action to mitigate the maximum risk exposure on the ground. The establishment of procedures aimed at reducing exposure to risks is critical.

### 2. Have you calculated or do you have an idea of the financial costs/benefits that have or will result from your approach to safety at work zones?

I have no clear idea but I know that several deaths have been avoided through our preventive approach.



**3. Would you like to see further steps from the government in terms of ensuring the safety of road workers and road users at road work zones?**

Yes, I would like the regulations to evolve as our practices evolve as a result of increased traffic and improved equipment.

**4. Will you consider getting the upcoming ISO 39001 certificate on road safety management?**

For me, certification in itself is not that important - management tools are important in terms of safety but certifying them is not necessarily useful.

**5. Are there any other areas that you would like to mention?**

It is important that the regulations change to keep pace with current practices and improve safety on construction sites.

**Short Bio of Damien Tillet, Head of Safety at ASF**



Damien works within ASF as Head of Safety. In this role he is responsible for developing and ensuring the occupational safety of the staff by promoting a comprehensive policy in this area through seven regional offices (each of which is in charge of 350 to 500 km of motorways). His role also includes the formalisation of procedures, notes and instructions in relation to staff safety. This includes the “mark-up manual” which is the guiding document on motorway markings (procedures and diagrams). Damien is a civil engineer with previous, extensive experience in the areas of operations and maintenance management for motorway companies and safety.



ETSC would like to thank Damien Tillet for his precious contribution.

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