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IMPACT ASSESSMENT on measures enhancing the effectiveness and efficiency of the tachograph system Revision of Council Regulation (EEC) No 3821/85

Accompanying the document

PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

amending Council Regulation (EEC) No 3821/85 to enhance the security, effectiveness and efficiency of the tachograph in road transport

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This report commits only the Commission's services involved in its preparation and does not prejudge the final form of any decision to be taken by the Commission.

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1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

1.1. Identification

This impact assessment examines options to improve the effectiveness and efficiency of the tachograph system used to enforcing the social rules in road transport. The Impact Assessment report has been prepared by the Directorate General for Mobility and Transport (DG MOVE). It is the basis for a Communication and a proposal to the European Parliament and the Council to repeal and replace Council Regulation (EEC) No 3821/85 on the recording equipment (reference n° MOVE/2008/008).

1.2. Organisation and timing

For the preparation of this initiative, DG MOVE set up an Impact Assessment Steering Group in which the following DGs took part: SG, ENTR, EMPL, JRC, JUST, SANCO. Two other DGs – INFSO and ECFIN – were invited to participate, but were unable to do so. DG MARKT was kept informed as they requested. The steering group held five meetings (2 March, 30 July, 6 October, 12 November 2010 and 17 February 2011). The steering group's comments were taken into account in the impact assessment.

1.3. Consultation for the Impact Assessment

DG MOVE has been in continuous contact with Member States and stakeholders through the Committee set up by Council Regulation (EEC) No 3821/85 for all issues related to recording equipment. The Committee normally meets once a year. The main stakeholders take part in this committee as observers. They include inspection and police organisations as well as manufacturers. In addition to this on-going exchange, DG MOVE has taken several initiatives to help prepare this Impact Assessment.

SMART Project

This was an extensive two year long consultation commissioned by the European Commission, ending in March 2009. The project brought together the main stakeholders and asked them to recommend possible improvements to the security and the user-friendliness of the digital tachograph. Some of their recommendations were implemented in 2009¹: the tachograph technical specifications were amended by committee procedure ('comitology': a regulatory procedure with scrutiny). Other recommendations are considered in this impact assessment (IA).

1.3.1. Joint Research Centre

In September 2009, DG MOVE asked the Joint Research Centre (JRC) to assess the present vulnerability and verifiability of the digital tachograph. The JRC reported in February 2010. The JRC also reported to the Commission the following month on technical scenarios for further developing the digital tachograph.

¹ Commission Regulation (EU) No 1266/2009 of 16 December 2009 adapting for the tenth time to technical progress Council Regulation (EEC) No 3821/85 on recording equipment in road transport, OJ L 339, 22.12.2009, p. 3–23.

1.3.2. Stakeholders consultation

For the purpose of this impact assessment, DG MOVE carried out a public stakeholder consultation from December 2009 to March 2010. Given the technical nature of the topic, participation was relatively large: 73 contributions, mostly of high quality, were received from various stakeholders.

Most stakeholders wanted to see the digital tachograph improved, but not replaced by some different type of recording equipment. Nearly all stakeholders were of the opinion that harmonised criteria at EU level for the recording equipment are necessary. The type approval process for the tachograph was considered satisfactory. Almost all stakeholders also stated that the level of security should be maintained or even enhanced. Several ideas were expressed and subsequently examined in the IA to reduce the cost of the recording equipment and/or make a better use of it - for example, merging the driver card with the driving licence, automatically recording the vehicle's weight, etc. However, some of the proposals submitted by stakeholders were discarded at the pre-screening (see chapter 4.2.).

This consultation met the minimum standards for consultation, as laid down in the Impact Assessment Guidelines. The individual contributions are available, together with a summary of the consultation, on the following website:

http://ec.europa.eu/transport/road/consultations/2010_03_01_tachographs_en.htm.

1.3.3. Social partners

In line with the Commission Impact Assessment Guidelines, the sectoral social dialogue committee on road transport was consulted on 26 May 2010. The European social partners subsequently agreed a joint statement on the review of the digital tachograph regulation, and this was taken into consideration when drafting this impact assessment.² The social partners recognise the importance of the tachograph as tool for the implementation of the social legislation. They underline the importance to combat fraud and manipulation and see therefore a need to dedicated specifications and adaptations to technical progress.

1.3.4. External contractor and Expert Panel

A contractor carried out a preparatory study for this IA. Given the highly technical nature of some of the issues under consideration, and to also ensure that all interests and viewpoints were properly represented, the contractor set up an Expert Panel including representatives of road transport associations, road transport unions, enforcement and type-approval authorities, card issuing authorities, vehicle manufacturers, and tachograph manufacturers. The Expert Panel reviewed the documents prepared by the contractor and attended a workshop at which the contractor's draft final report was reviewed and discussed.

1.4. Results of the consultation of the Impact Assessment Board

Following the submission of a draft report to the Impact Assessment Board (IAB) on 16 March 2011 and a hearing with the IAB (which took place on 6 April 2011), the IAB sent

² The Joint Statement on the Review of the Tachograph Regulation by IRU and ETF can be found on the following website: http://ec.europa.eu/employment_social/dsw/public/actRetrieveText.do?id=8903

its opinion on 8 April 2011, asking DG MOVE to take into account the comments submitted and discussed in the hearing.

Firstly, the report has been adapted to clarify the intervention logic and provide a more appropriate set of objectives.

- A table 3 has been added mapping the proposed measures with the different objectives
- The part on the sanctions regime has been more elaborated (section 2.3.2.)
- Chapter 3 has been revised, in particular to formulate the operational objectives in more concrete terms
- Policy package 3 has been redesigned to present a possible lower cost alternative and the IA has been adapted accordingly
- It has been underlined that the policy packages are designed to achieve all objectives and represent genuine alternative policy options
- Annex IX has been added explaining the legislative proposals to be put forward and for which further impact assessments are foreseen.

Secondly, the report has been adapted to strengthen the presentation of expected benefits and costs for each of the policy options.

- It has been explained why the assessment of impacts remains rather descriptive (see also section 2.2.1.)
- The impacts on the costs for road have been clarified
- The costs and benefits of each policy package have been presented in a clearer way by adding table 8
- The calculations related to the reduction of administrative by redefining the scope have been added in Annex III.
- The impact on fundamental rights and privacy concerns have been more elaborated in section 5.3.4.

Thirdly, the report has been adapted to provide clear references to stakeholder input received in consultation throughout the main text of the report.

- A link to the Joint statement of IRU and ETF has been provided and a short summary given (section 1.3.4.)
- The references to the stakeholder consultation have been adapted to clearly indicate the relevant stakeholder

Finally, the report has been adapted to strengthen the section on future monitoring and evaluation, to ensure the presence of an adequate evidence base for future initiatives.

- Chapter 7 has been revised in order to reflect the adapted operational objectives
- Chapter 7 has been clarified to explain how the monitoring will be carried out and what the Commission intends to do in order to have the necessary data for evaluation and monitoring.

The executive summary of the IA has also been adapted to reflect the mentioned changes.

2. PROBLEM DEFINITION

2.1. Background information: EU social legislation in the field of road transport and the tachograph system

Since 1969, the European Union (EU) has laid down social legislation in the field of road transport. The aim is to improve road safety and drivers' working conditions, and to ensure fair competition among transport companies. Regulation (EC) No 561/2006 lays down maximum daily and weekly driving times and minimum daily and weekly rest periods for drivers. It is applicable in all Member States.³ The legislation applies to drivers of trucks with a maximum permissible mass of more than 3.5 tonnes and to drivers of buses or coaches carrying more than nine persons.

The EU has developed a comprehensive policy on inspecting and checking compliance with social road transport legislation. This policy relies on two main pillars. The first pillar is Directive 2006/22/EC which lays down a minimum level of check at the roadside and at the premises of the undertakings to be carried out by Member States.⁴ The second pillar is Council Regulation (EEC) No 3821/85, hereinafter referred to as 'the Tachograph Regulation'. The basis for the control carried out during the checks as required by Directive 2006/22/EC is in practice the data on driving, working and resting time⁵ which have to be for each operator and each driver trustworthy, reliable and verifiable by enforcement officers of all Member States. These data are recorded by "tachographs", which are on-board recording equipment fitted to the vehicles regulated by the provisions of the Tachograph Regulation.

In this context, the tachograph plays a crucial role in enforcing social rules in road transport.

The Tachograph Regulation sets technical standards, establishes the rules on the use, type approval, installation and inspection of tachographs. It therefore creates a range of legal obligation to manufacturers, authorities but also to transport operators and drivers.

For the time being, two types of recording equipment are in use. The analogue tachograph has been in use since 1985 and is still used in vehicles registered before 1 May 2006. It records

³ Directive 2002/15/EC sets additional limits on drivers' weekly working time and contains provisions on breaks and night time working.

⁴ Directive 2006/22/EC also contains obligations on the equipment of control officers. It also categorises the infringements against the tachograph regulation in three categories (very serious infringements, serious infringements, minor infringements). In addition, the Commission has issued guidelines for best enforcement practice concerning checks of recording equipment to be carried out at roadside checks and by authorised workshops. Furthermore, the Commission services issue regularly Guidelines aiming at harmonising the way the social legislation is implemented and controlled by Member States.

⁵ Article 15(3) of Council Regulation (EEC) No 3821/85

the activities of the driver (driving, rest/break, availability, other work) on a waxed paper disc called 'record sheet'.

The second type – the digital tachograph – was introduced via a new Annex IB to Council Regulation (EEC) No 3821/85.⁶ It is obligatory in vehicles registered after 1 May 2006. The driver's activities are recorded and the data are stored after encryption in the recording equipment and on a personalised 'smart driver card'.⁷ It is widely agreed within the enforcement community that the digital tachograph by providing a tamper-proof way of recording driving data is a great improvement over the analogue tachograph in terms of effective enforcement and reducing the risk of fraud⁸.

Since June 2010, the digital tachograph is also mandatory⁹ for new vehicles used in international transport by the non-EU contracting parties of the European Agreement on Road Transport (hereinafter "AETR"), which account for another 22 countries outside the EU in Europe and in the Commonwealth of Independent States.

Facts and figures on tachographs

The Tachograph Regulation directly affects some 600 000 road haulage operators and 330 000 road passenger carriers, nearly all of which are small or medium-sized enterprises (SMEs). Only 1% of the EU's road haulage operators are companies with more than 50 employees. The share of micro-companies with less than 10 employees is 80% or more in almost all EU Member States¹⁰. Around six million vehicles are fitted with tachographs as of the end of 2010.¹¹ On average, around 400 000 new commercial vehicles are registered each year in the EU and EFTA; since 2006, all these new vehicles have to be equipped with the digital tachograph.¹² Four years after its introduction in 2006, the digital tachograph is now fitted to more than 1.5 million vehicles; the rest still have analogue tachographs.¹³

The tachograph consists of a vehicle unit which is normally placed in the vehicle cabin, of a motion sensor which detects vehicle's motion and sends this information to the vehicle unit and of a cable connecting vehicle unit and motion sensor. For the digital tachograph, the driver uses a driver card; workshops need a workshop card to carry out the inspection and calibration of the tachograph. A more detailed description of the tachograph can be found in Annex I.

Since its adoption, the Tachograph Regulation has been adapted to technical progress ten times, the last time in 2009.¹⁴ This latest amendment addressed some of the criticisms made against the user friendliness of the digital tachograph, concerning manual inputs of time spent not driving, and rounding up of the time to the next minute. It is estimated by the Commission

⁶ Commission Regulation (EC) No 1360/2002 of 13 June 2002 adapting for the seventh time to technical progress Council Regulation (EEC) No 3821/85 on recording equipment in road transport, OJ L 207, 5.8.2002, p. 1–252.

⁷ The 'smart driver card' is a card with a micro-chip that can store the data needed to check the driving and resting time of the driver.

⁸ See in this respect section 4 of Annex 1.

⁹ Sixth amendment to the AETR agreement, ECE/TRANS/SC.1/386/Add.1.

¹⁰ See NEA, Road Freight Transport Vademecum, 2009.

¹¹ ACEA statistics on commercial vehicles.

¹² ACEA statistics on commercial vehicles.

¹³ According to tachograph manufacturers.

¹⁴ Commission Regulation (EU) No 1266/2009

that the new measures, which will enter into force in October 2011, account for a reduction of administrative burden of €234.5 million a year. Most importantly, however, the amendment considerably reduces the vulnerability of the digital tachograph to physical manipulations.¹⁵

2.2. What are the issues or problems that may require action?

2.2.1. Problem 1: Social rules are still too often breached

Quantitative historical data on frauds are not available. Although there is a general obligation for Member States to submit statistics every two years on the application of the social legislation (Regulation (EC) No 561/2006 and Council Regulation (EEC) No 3821/85), there was until recently no precise enough reporting format. Evidence on the causes of existing compliance problems and on the differences in application across Member States is based on consultation input rather than supported by hard quantitative data. The situation is however improving since the Commission adopted a new reporting format in 2008. Full fledged information will thus be available only end of this year (for the period 2009-2010). Moreover it should be borne in mind that the digital tachograph was introduced only in 2006. There is only one report since the introduction of the new device, covering the period 2007-2008, which makes comparison of data impossible.

However, according to some recent data available, on average 9% of controlled vehicles¹⁶ are found breaching the social rules. Roughly one fourth of the latter – are found breaching the Tachograph Regulation in particular, for instance by driving without a card, using the card of another driver or having physically manipulated the equipment.

Figure 1 presents the categories of offences detected at roadside checks. 45% of them relate to breaches of social legislation¹⁷. More complete yearly data reported to the Commission by the Member States show that around 300 000 offences concerning recording equipment were detected in the course of nine million roadside checks during the period 2007-2008¹⁸ (latest data available). In other words, 3% of the trucks controlled were misusing or manipulating tachographs, which is grossly in line with above figures. In some countries the figure may be higher as according to Tispol and Euro Contrôle Route (ECR)¹⁹, the UK authorities detected fraud or manipulation of tachographs in 10-20 % of the roadside checks they carried out²⁰.

¹⁵ These amendments improved resistance to magnetic fields (see Point 3.20 of the Annex to Regulation (EU) No 1266/2009) and introduced the requirement for the system to corroborate the vehicle motion information from the motion sensor by information derived from one or more sources independent from the motion sensor. In practice, the second source could be satellite, GSM-based positioning of the vehicle or moving parts of the vehicle (see Point 3.1 of the Annex to Regulation (EU) No 1266/2009).

¹⁶ Own calculations based on Euro Control route, Annual report 2009

¹⁷ This figure can be split between the breach of the driving and working time provisions (34%) and the breach of the Tachograph Regulation (11%).

¹⁸ 25th report from the Commission on the implementation of the social legislation relating to road transport (SEC(2011)52 final).

¹⁹ TISPOL and ECR are European association of police and enforcement organisations carrying out road inspections and checks.

²⁰ Information provided on an informal basis to the Commission.

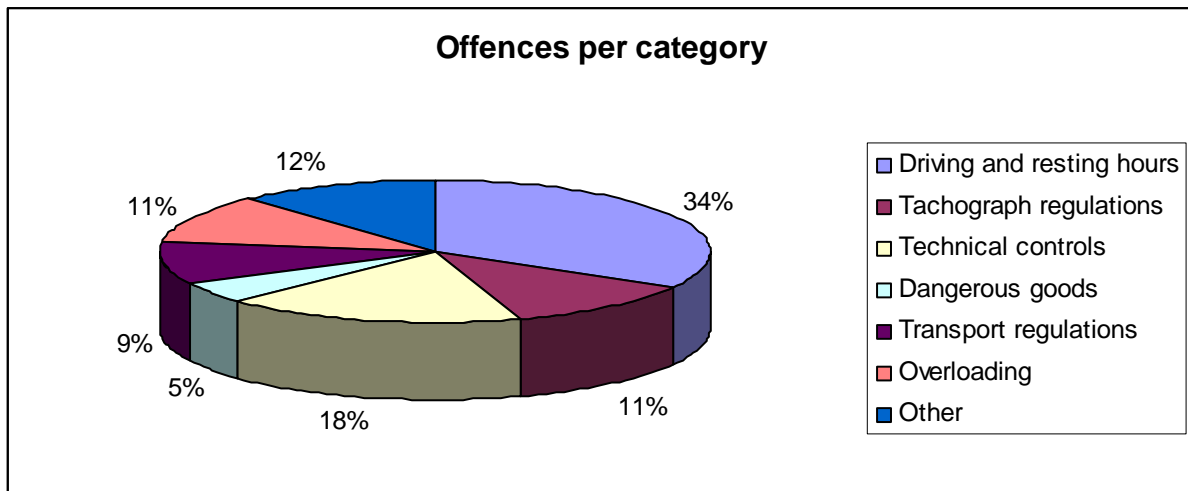


Figure 1: Offences per category

Source: Euro Control Route, Annual Report, 2009.

These figures must be put in the perspective of Directive 2006/22/EC which requires from Member States to control as a minimum only 3 percent of days worked by the drivers.²¹ Given the possibility of risk rating-based targeted checks²², the total number of offences related to social legislation cannot be obtained by simply extrapolating to the total fleet the results obtained for controlled vehicles.²³ However, it can be safely said that the total number of vehicles on the roads in breach of the social legislation, including the Tachograph Regulation, which are on the roads in a given week, is much higher than the number of offences actually detected at checks.²⁴ If we take the conservative operational assumption that 5% of the total fleet is in breach of social legislation and 2% in breach of Tachograph Regulations²⁵, this would mean that 180 000 and 45 000 vehicles would be on average in breach of respectively EU social legislation and Tachograph Regulation.

While breaches of the driving hours and rest periods legislation are more frequent than infringements against the tachograph regulation, it should be noted that the latter lead to much more severe consequences, as most likely, numerous infringements are committed against the driving times once the device is manipulated; therefore, there is a high efficiency by attacking infringements against the tachograph regulation.

²¹ See Art. 2(3) of Directive 2006/22/EC.

²² See Art. 9 of Directive 2006/22/EC.

²³ Furthermore, it should be noted that extrapolation is difficult as inspectors may select primarily "suspicious" trucks based on their experience (i.e. sample selection bias). This is balanced by the fact that the bias is known and the requirement laid down in Directive 2006/22/EC which stipulates that controls have to be carried out on a non-discriminatory basis.

²⁴ Indeed, local evidence from Denmark show that up to 40% of drivers are breaching social legislation (<http://www.dr.dk/Regioner/Vest/Nyheder/MidtVest/2010/03/16/071601.htm>).

²⁵ This conservative estimate assumes that the level of non-compliance with social legislation detected at roadside checks is two times higher than it is for the whole fleet. We assumed an even higher level of non-compliance in particular with Tachograph regulation, as many offences to this particular piece of legislation go undetected at roadside checks, which is not the case of social legislation as a whole.

The breach of the social legislation has a number of importance consequences on road safety, on the internal market for road transport and on drivers' working conditions, as underlined also by the social partners in their Joint Statement²⁶.

2.2.1.1. Road safety

Non respect of the minimum breaks and rest periods and of the maximum driving times can lead to more fatigued drivers. In a recent study²⁷, fatigue of truck drivers has been identified as the main cause of 6% of accidents, 37% of which were fatal. This is in spite of the existence of the social rules in road transport. At the same time, it is said that the role of fatigue in accidents is probably understated by the fact that, on the one hand, it's very difficult to prove that it has been the main cause of the accident and, on the other hand, "there are various stages of vigilance, from slight fatigue to sleeping, and fatigue is often linked to other causes such as being inattentive". An American study²⁸ confirms this assumption, by saying that "the incidence of driver fatigue in underrepresented [...] with regards to truck drivers. Research has suggested that truck driver fatigue is a contributing factor in 30 to 40 percent of all heavy truck accidents".

The Handbook on estimation of the external costs in transport sector²⁹ contains estimations on the cost of accidents for Heavy Duty Vehicles (hereinafter "HDV"). On the basis of these estimations we conservatively estimated the cost of fatigue of professional drivers in terms of accidents to €2.2 billion.³⁰ Furthermore, it is estimated³¹ that fatalities involving buses represent 28% of those involving HDV. Under the simplifying assumption that other costs of accidents (injuries, damage to the infrastructure, congestion, etc...) involving buses are following the same relation to the same costs generated by HDV, **the total cost of accidents for all commercial vehicles above 3.5 t would amount to €2.8 billion.**

2.2.1.2. Internal market

Professional drivers and transport companies operate in a highly fragmented market and a fiercely competitive environment. Firms which do not comply with the legislation can gain a sizeable competitive advantage by cutting prices, as staff costs account for 30-40% of the total operating costs.³² These costs vary a lot on regional basis. In EU-15 Member States³³ labour costs can reach 40-50% of the total costs. Driver wages in Bulgaria represent 17.5% of those in the Netherlands. It can be reasonably assumed that the higher the share of wage costs in the total costs, the larger the incentive not to comply with social legislation.

As described above, between 5% and 9% of the drivers could be in breach of social legislation at any time. Such a proportion of market participants enjoying an undue competitive advantage can upset the functioning of the local markets and of the internal market as a whole. Due to the lack of precise data on the severity of infringements to the social legislation

²⁶ See section 1.3.4.

²⁷ IRU, European Truck Accident Causation Study, 2006.

²⁸ National Transportation Safety Board, Factors That Affect Fatigue in Heavy Truck Accidents – Safety Study, 1995

²⁹ CE Delft, Handbook on estimation of external costs in the transport sector, 2008

³⁰ Details of the calculation are attached in Annex V.

³¹ CARE Database.

³² Road Freight Transport Vademecum, Issue N°1, DG MOVE

³³ EU-15 describes the EU Member States before the 2004 enlargement. EU-12 are the EU Member States that joined since 2004.

(for example, by how many hours the maximum driving time has been overrun), it is however difficult to quantify the effects.

2.2.1.3. Working conditions

Regulation 561/2006/EC aimed at "improving the social conditions for employees who are covered by it [...] by means of the provisions pertaining to maximum driving times [...], the provision which obliges the drivers to take a regular weekly rest period". Non-compliance with legislation affects the working conditions of the drivers. This has also important consequences on health and lifestyle of professional drivers.

Several reviews and empirical studies demonstrate various negative overall health effects of extended working hours: Long working hours are associated with poor perceived health, more illnesses, or even increased mortality³⁴. In the road transport, stress, exhaustion and unsuitable position body can lead to several distinct health problems such as psycho-vegetative impairments (gastrointestinal disorders, musculoskeletal fatigue...).³⁵ In the case of drivers engaged in long distance international transport, respect of the social legislation is essential also for maintaining the proper balance between social and professional life. All these problems are obviously exacerbated by non-respect of the social legislation.

Like in the case of the problem on the internal market, quantification of the problem was not possible owing to the lack of precise data on the severity of infringements.

2.2.2. *Problem 2: The tachograph system is not sufficiently efficient*

As indicated above, the use of the tachograph is a legal requirement for a large number of firms, including small and medium-sized enterprises (SMEs), which are obliged to record and report specific information. The tachograph system has been designed and has functioned so far primarily as a policing tool, but not as a labour saving device. In this respect, stakeholders³⁶ reported that there is room to improve the ease of operation of the tachograph, especially the digital tachograph, and its additional functionalities, to facilitate the drivers' work and support the efficiency of the road transport industry.

Although the introduction of the digital tachograph and the subsequent technical adaptations have already substantially reduced the administrative burden (see Section 4 of Annex I), the system still entails important administrative costs. The High Level Group of Independent Stakeholders on Administrative Burden, commonly called the "Stoiber group", estimated the administrative cost of compliance with Regulation 561/2006 to €3.102 billion, out of which €3 billion (or 97%) were qualified as administrative burden. Another internal estimation made by the European Commission³⁷ indicates a slightly lower figure of **€2.7 billion**. Since the Stoiber Group report notably does not take into account the effect of the latest amendment of the Tachograph Regulation,³⁸ which, according to internal Commission estimates, brought

³⁴ Deloitte Study (December 2010) to support an Impact Assessment on Further action at European level regarding Directive 2003/88/EC and the evolution of working time organisation.

³⁵ ECO-LOGICA LIMITED, John Whitelegg, Health of professional drivers, A report for Transport and General Workers Union, Lancaster, 1995.

³⁶ See contributions of transport companies, industry associations or tachograph manufacturers (IRU, UEAPME or Continental) and the Joint Statement of the social partners in road transport

³⁷ Cap Gemini, EU project on baseline measurements and reduction of administrative costs, 2009

³⁸ Regulation (EU) No 1266/2009.

savings in administrative costs amounting to €234.5 million a year³⁹, we retained the second figure as a probably closer indication of the administrative burden related to the social legislation.

To conclude, the literature on the EU tachograph system⁴⁰, public consultation and other contributions⁴¹ identify two main problems: the insufficient effectiveness of the tachograph system in preventing offences to the social legislation in road transport and the low efficiency of the system, including the untapped potential for reducing the administrative burden.

2.3. What are the underlying drivers of the problems?

The subsections below examine the root causes of these problems.

2.3.1. The tachograph system is still vulnerable to manipulation and fraud

2.3.1.1. Seals do not properly perform as an indicator of tachograph manipulation

Reports from national police forces, anti-fraud officers and research institutes⁴² show weaknesses of the tachograph in terms of its capacity to resist tampering.⁴³ Numerous police and enforcement authorities report cases of manipulation by magnets or ‘exotic devices’ which alter the electronic encrypted signal sent by the motion sensor to the digital tachograph. There are even commercially available products based on such magnets or ‘exotic devices’ and specifically designed to tamper with tachograph signals. The most typical of these frauds, through simple magnets, are well known in the sector and were even explained and commented on popular television programmes in several Member States⁴⁴. Although there is no quantified data on the volume of such frauds, TISPOL and (ECR) have indicated to the Commission that these frauds would represent around 30% of the offences related to tachographs.

The new specifications adopted recently by the Commission to reduce the vulnerability of the tachograph⁴⁵ will render manipulation more complicated⁴⁶, but not impossible.

Manipulations of the tachograph can be detected at roadside checks as their use leaves a record of abnormal sequences of events (such as unrealistic deceleration or acceleration), broken seals of the motion sensor or the record of 'events' by the Vehicle Unit. Visual detection is difficult at roadside checks as exotic devices and motion sensors are installed in areas of difficult access, but is possible in workshops.

³⁹ Cf. part 2.1. above

⁴⁰ Ibid.

⁴¹ Notably the findings of the High Level Group of Independent Stakeholders on Administrative Burden.

⁴² See for instance JRC, Report on the attacks to security of the Digital Tachograph and on the risk associated with the introduction of adaptors to be fitted into light vehicles, 2007; JRC, Report on the vulnerability and controllability of the digital tachograph, 2010; 25th report from the Commission on the implementation of the social legislation relating to road transport, SEC(2011)52; Price Waterhouse Cooper, Analysis of the technical and organisational measures employed by Member States in the application of Directive 2006/22/EC, 2009.

⁴³ See Annex VI for more details.

⁴⁴ In the Netherlands, Italy and France

⁴⁵ See footnote 14.

⁴⁶ JRC, Report on the attacks to security of the Digital Tachograph and on the risk associated with the introduction of adaptors to be fitted into light vehicles, 2007

According to the requirements of Section V of Annex IB of the Tachograph Regulation,⁴⁷ the motion sensor and the vehicle unit are sealed by approved workshop after installation. Seals are intended as a means of detecting by visual inspection the tampering of the mechanical interface between the motion sensor and the gearbox. However, according to a JRC study,⁴⁸ seals are not requested to match a minimum performance level at the European level or to comply with a specific standard. Consequently, the quality of seals varies largely between countries. In some cases, the seals are easily forged and mechanically fragile. Because of this, sealing is not completely fulfilling its expected objective. Moreover, fake seals can be easily bought on the online free market, opening the door to frauds. Misunderstandings between operators and enforcement officers have also been reported. The legislation does not require sealing of all devices, but many enforcement officers are not well informed of that fact. It has been reported to the Commission that new devices that are exempted from sealing are sometimes ‘sealed’ to avoid fines from non informed controllers, which adds to the confusion and increases the difficulty in detecting fraud.

2.3.1.2. Vulnerabilities of encryption technology

According to the already mentioned JRC study,⁴⁹ the legislation does not accommodate a way to deal with the continuous progress made in cryptography and in cracking ciphers, and, consequently, with the obsolescence of the prescribed security mechanisms. The strength of a number of security mechanisms provided for in the Tachograph Regulation⁵⁰ is below the level currently requested for certification at the ITSEC High level (ITSEC is the international body in charge of certifying EU security standards; the Tachograph regulation requires these standards to be met by the equipment). This threatens the continued delivery of security certification for new digital tachograph equipment by security certification authorities.

In practical terms, the encryption standards currently applicable to the digital tachograph contain a number of vulnerabilities, which may in future allow the manipulation of downloaded data and of data stored on driver cards. Moreover, the encryption of the data recorded by the digital tachograph system is based on certain digital keys. When the digital key used in the digital tachograph is disclosed, the integrity and authenticity of the data certified by the key can no longer be trusted.

2.3.1.3. Misuse of driver cards

According to ECR and TISPOL,⁵¹ around 40% of all tachograph fraud relates to the fraudulent use of driver cards. The driver card is an essential element of the digital tachograph system as it is on that card that all data relevant for the control of social legislation is stored. Fraud can include driving without a card, but this can be easily detected at the roadside check. Driving when the card has been intentionally manipulated⁵² is more problematic to detect.

A major problem is that drivers can easily declare their card lost or stolen and on this basis obtain multiple driver cards from different national authorities. They can also let other drivers

⁴⁷ Requirement 251 and following of Annex IB to Council Regulation (EEC) No 3821/85.

⁴⁸ JRC, Report on the vulnerability and controllability of the digital tachograph, 2010.

⁴⁹ JRC, Report on the vulnerability and controllability of the digital tachograph, 2010.

⁵⁰ Appendices 10 and 11 of Annex IB to the Tachograph Regulation contain the minimum strength requirements and specifications concerning the security mechanisms of the tachographs.

⁵¹ Information provided in an informal way to the Commission.

⁵² Cf. Point *Vulnerabilities of encryption technology* above.

use their card. The latest tachograph legislation⁵³ requires Member States to exchange electronically information in order to ensure that the tachographs are properly used to apply the social road transport rules. The Commission adopted on 13 January 2010 a Recommendation⁵⁴ praising Member States to use the TACHOnet messaging system to exchange information. The TACHOnet system includes information on the cards which are valid or declared lost or stolen. This Recommendation provides the necessary guidelines to implement this new requirement. However, two Member States (Portugal and Denmark) are still not connected to the system. Moreover, the regular statistics on the functioning of the TACHOnet indicate that the many countries are unable to provide the information in a significant number of cases. The worse performer (Lithuania) shows an answer rate below 70%.⁵⁵ As a result the exchange of information between card issuing authorities is not fully effective.

Another relevant aspect is the impersonal character of the driver card which facilitates fraud. It seems relatively easy to get access to driver cards from other persons who do not directly need this card and who seem to be easily ready to hand over their driver card to other drivers.

2.3.1.4. Fraudulent or negligent workshops

Workshops, being on the front line of the tachograph system, can play an important role in detecting manipulation. They are often supporting the controllers for in depth inspection, when fraud is suspected by enforcers. They are also responsible for affixing the seals. It is not possible to have security without trusted workshops.

Workshops accredited for digital tachograph calibration and maintenance were historically selected from the network of analogue tachographs workshops, with a particular attention to exclude the fraction of them involved in the past in frauds affairs (estimated around 30%).⁵⁶ Still, the trustworthiness of the workshops has been called into question by inspection authorities (TISPOL and ECR)⁵⁷, and the stakeholder consultation recognised that there is room for improvement in this respect (see in particular the contribution by CORTE).⁵⁸ The workshop can notably develop a privileged commercial relation with a transport company after the accreditation phase is over. Cases of transport operators having their own workshops to fit and calibrate tachographs seem to be a particular area of concern.⁵⁹ The problem seems to be particularly pronounced in Germany. Ownership questions are not clearly regulated and harmonised at European level which creates room for confusion.⁶⁰

Frauds by workshops are difficult to catch during workshops audits. More efficient are checks made directly after a calibration session, where an inspector asks for a second session in the workshop, for calibration crosscheck. The Netherlands reported that they are organizing

⁵³ Commission Regulation (EU) No 1266/2009.

⁵⁴ Recommendation 2010/19/EU.

⁵⁵ Cf. TACHOnet statistics February 2011,

http://ec.europa.eu/transport/road/social_provisions/tachograph/doc/2011_02_tachonet_statistics.pdf.

⁵⁶ JRC, Report on the vulnerability and controllability of the digital tachograph, 2010

⁵⁷ Information provided in an informal way to the Commission

⁵⁸ Confederation of Organisations in Road Transport Enforcement (CORTE) was established in 2004 with the aim to bring together national bodies from various European countries having a responsibility and interest in the field of road transport. For the contribution to the stakeholder consultation, see http://ec.europa.eu/transport/road/consultations/2010_03_01_tachographs_en.htm

⁵⁹ CORTE contribution to stakeholder consultation.

⁶⁰ JRC, Report on the vulnerability and controllability of the digital tachograph, 2010.

randomly that kind of check, by calling the closest controller in the area, for an instantaneous second check. Thus the quality and frequency of the audits seems important for the detection of fraud.⁶¹ Currently, according to TISPOL⁶², this quality and frequency is highly variable from one Member State to another, and this is reflected in the amount of fraud detected.

2.3.2. *Effectiveness of the controls and the dissuasive effect of sanctions*

In 2009, the Commission has adopted a recommendation⁶³ providing guidelines for best enforcement practice on countermeasures to detect and prevent the use of manipulation devices as identified in research carried out by the Joint Research Centre.⁶⁴ However, despite the adopted recommendation, the assessment undertaken by the Commission has shown that training of enforcement officers and sanctions are still issues that need to be tackled.

2.3.2.1. Non harmonised training of enforcement officers

Art. 11 (2) of the Directive 2006/22/EC indicates that Member States shall ensure that enforcement officers are well trained for the execution of their duties, including regarding the checking of the digital tachographs. Preferably this training should be available to all control and enforcement officers involved in these tasks, and a certain degree of harmonisation at both national and international level is necessary in order to contribute to a level playing field for all actors involved. However, according to a recent study analysing the organisation of the enforcement of Directive 2006/22/EC⁶⁵ there is a wide range of organisations with different training practices involved in the control and enforcement within the various Member States. First of all, control and enforcement differ considerably in terms of operational and organisational responsibilities and are, in most cases, spread over many different institutions⁶⁶. There are cases where these tasks are complicated by the involvement of several bodies with different roles. Another factor contributing to this situation is the lack of a clear mandate for each entity.

Despite the obligation set up in the legislation, only 20 out of 29 Authorities analysed in the report had completed in 2009 the training of their enforcement officers. The duration of training varies significantly: from 5 hours for the initial training in Estonia to 100 hours in Slovakia. On average, the officers spent 30 hours on initial training on digital tachographs and 14 hours on the follow-up training. The study indicated that in several Member States, untrained officers may be involved in roadside checks of digital tachographs.

The training of enforcement officers, and foremost the coordination and cooperation between the different enforcement bodies in the field of training, is of great importance, given the complexity of the road transport legislation, the highly technical aspects of road transport and

⁶¹ Ibid.

⁶² Information provided in an informal way to the Commission.

⁶³ Commission Recommendation C (2009) 108, providing guidelines for best enforcement practice on countermeasures to detect and prevent the use of manipulation devices.

⁶⁴ JRC, Report on the attacks to security of the Digital Tachograph and on the risk associated with the introduction of adaptors to be fitted into light vehicles, 2007.

⁶⁵ Price Waterhouse Cooper, Analysis of the technical and organisational measures employed by Member States in the application of Directive 2006/22/EC, 2009.

⁶⁶ In a number of Member States, the police (usually under the responsibility of the Ministry of Interior) are in charge of the enforcement of the Transport Acquis. In some Member States, there are branches of specialised police which are part of the Ministry of Defence. Alongside the police, there are generally specially designated bodies falling under the Ministry of Labour or the Ministry of Transport, such as Labour and Transport Inspectorates.

the role of road transport in traffic safety. According to the abovementioned study, in the UK, only 258 officers are sufficient to carry out the majority of both roadside and company checks. This figure is striking in comparison to the number of officers involved in checks in countries of similar size, such as France (3500) or Germany (5937). The study interprets the situation by saying that these few officers are able to execute their activity successfully because they are well trained and fully equipped.⁶⁷

The differences in the quality and effectiveness of trainings seem in some cases to be the result of a conscious policy of the Member States. It appears – according to the study – that there are Member States where the training of enforcement officers is being given such a low priority that it is virtually non-existent. The fact that in many countries there is no fixed budget for training might give an indication of their actual awareness of the importance of training. Also, not all training programmes do include all the necessary elements, as for example fraud identification for tachographs is not covered by several authorities.

At the same time, it must be noted that the training authorities in the various Member States have developed a relatively advanced level of cooperation in their respective national context (8 of them are sharing knowledge on an ad-hoc basis, 19 on a regular basis) and in terms of international cooperation. Almost half of the training institutions work together regularly with foreign organisations during roadside checks. This sets the basis for exchange of best practice and for enhancing the quality of enforcement in worst performing States.

As a conclusion, elements gathered indicate that due to the diversity and multiplicity of enforcement officers, the lack of harmonisation of the requirements on both the training and the organisation of enforcement officers translates into large differences in the quality of preparation and of effectiveness of roadside and company checks on the compliance with social legislation in transport.

2.3.2.2. Scope of data from the digital tachograph available to enforcement officers

With analogue tachographs, drivers have to record the start and end place of their working day. For digital tachographs, this requirement has been replaced by an obligation to record this information at the level of Member States, making this information practically useless for enforcement purposes. Enforcement officers indicated during the consultation process and within the Expert Panel that the loss of this information on the start and end of journeys has been a detrimental aspect of the switch from analogue to digital tachographs. This has been confirmed by a Report from the JRC⁶⁸. Indeed, this information could be used to cross check the recordings of driving time and speed and detect more easily anomalies which suggest the existence of fraud.

2.3.2.3. Sanctions policy

Regulation (EC) No 561/2006 requires Member States to lay down rules on penalties applicable to infringements to European social rules in road transport, as defined by the said Regulation itself and the Tachograph Regulation. Notably, the legislation requires that the

⁶⁷ Ibid.

⁶⁸ JRC, Report on the vulnerability and controllability of the digital tachograph, 2010. The report indicates: "Compared to analogue tachographs, controllers are bewailing the absence of clear information about the location of the daily work period start/end. A clear and mandatory indication of this would help controllers to rebuild the daily road fingerprints, central for fraud detection."

penalties concerning such infringements are effective, proportionate, dissuasive and non-discriminatory.⁶⁹ Article 21 of this Regulation states in addition that the possibility of immobilising the vehicle where serious infringements are detected should also be included within the common range of measures open to Member States. However, there is no definition in the Regulation of what should be considered a serious infringement.

In 2009, Directive 2009/5/EC amending Annex III to Directive 2006/22 introduced a detailed categorisation of infringements to European social legislation in road transport according to a three step scale going from minor to very serious infringement. Most of the infringements to the Tachograph Regulation were qualified as serious or very serious infringements. In particular, all infringements related to fraud and inability/unwillingness to produce data fell in the category of very serious infringements. Also Regulation 1071/2009 on the admission to the occupation⁷⁰ which will apply with effect from 4 December 2011 classifies frauds of tachographs as one of "the most serious infringements".

The Commission *Report analysing the penalties for serious infringements against the social rules in road transport, as provided for in the legislation of the Member States*⁷¹ shows that the rules on penalties applicable to serious infringements of the social legislation vary appreciably between Member States as regards the types of penalties, the level of fines and the categorisation of infringements. In particular:

- The financial penalties for most serious infringements have been found to stretch from €58.23 in Malta to €5 000 and more in Austria, Cyprus, Germany and Ireland. The amounts of the fines for the same infringement can vary by as much as 1:10 from one Member State to another;
- Some Member States provide for differentiated, while others for non-differentiated penalties, as the latter do not distinguish in their legislation between different types or categories of infringements;
- Only 15 Member States provide explicitly in their legislation for the possibility of immobilisation of the vehicle in breach of legislation⁷²;
- Seven out of 27 Member States provide for imprisonment in cases of serious infringements;
- Only a few Member States provide for penalties to the operators in the transport chain (consignors, freight forwarders, tour operators, etc...) which do not ensure that contractually agreed transport time schedules observe social

⁶⁹ Article 19(1) of Regulation (EC) No 561/2006.

⁷⁰ Regulation (EC) No 1071/2009 establishing common rules concerning the conditions to be complied with to pursue the occupation of road transport operator and repealing Council Directive 96/26/EC, OJ L 300, 14.11.09, p. 51

⁷¹ Report from the Commission analysing the penalties for serious infringements against the social rules in road transport, as provided for in the legislation of the Member States, COM(2009)225.

⁷² The legal possibility to immobilise the vehicle can be essential for sanctioning the fraud on Tachograph Regulation. The JRC report on the vulnerability and controllability of the digital tachograph indicates a case study from France where trucks stopped during the night with evident indications of fraud can only be controlled in workshop the following day. Drivers, whose vehicles are not immobilised by the enforcement officers, can then use the night to eliminate the proofs of fraud.

legislation rules. Even in these few Member States, such penalties are not applied in practice.

- While for infringements against the driving times and rest periods, it is rather clear which infringement has to be considered to be more serious than another, the categorisation of infringements varies considerably between Member States for infringements against Regulation (EEC) No 3821/85. Some infringements are seen as serious infringements in one country, but not necessarily in another.

The disparities between the sanctions applied in the Member States are a source of potential legal problems, such as discrimination between transport operators of different nationalities, or the type of situation where the driver contravenes the tachograph legislation following his employer company's instructions and, in some countries, the legislation does not provide for the criminal liability of companies in general, but still provides for a penalty of a criminal nature against the driver. The report of the Commission⁷³ makes it clear that "the differences in sanctions can only be partly explained by the socio-economic differences that make the same fine proportionate and dissuasive in one country but not necessarily in the other." In the majority of cases, non harmonised sanctions distort the Internal Market and more importantly send contradictory and misleading signals to the drivers and undertakings concerning the gravity of infringements and the social cost of non-compliance.

2.3.3. *The use of the tachograph system is not sufficiently optimised*

As explained in part 2.1 above, administrative burden related to the compliance to Regulation 561/2006 amounts to € 2.7 billion. The Stoiber Group indicated a number of underlying drivers behind this problem, while others have been suggested in the course of the stakeholder consultation⁷⁴:

2.3.3.1. Inadequate provisions of the Tachograph Regulation

Insufficient scope of exemptions

According to Article 13 of Regulation (EC) No 561/2006 Member States may grant exemptions, among others, for vehicles or combination of vehicles with a maximum permissible mass not exceeding 7.5 tonnes used for carrying materials, equipment or machinery for the driver's use in the course of his work, if the vehicle is used within a 50 km radius from the base of the undertaking and on condition that driving the vehicle does not constitute the driver's main activity. According to stakeholders participating in the Stoiber Group, "the restriction of this exemption possibility to a radius of 50 km is not appropriate as many of those companies in focus of this provision work in a bigger range around their company base than 50 km. The radius for this exemption could therefore be expanded to 150 km as this would not significantly touch road safety according to stakeholders. For this proposal the [Group] has estimated a reduction of burdens up to €59 m."⁷⁵ According to the Stoiber Group other companies are not covered by the abovementioned exemption but – with regard to road safety aspects – are comparable to the exempted groups and could be covered

⁷³ Report from the Commission analysing the penalties for serious infringements against the social rules in road transport, as provided for in the legislation of the Member States, COM(2009)225.

⁷⁴ See for instance contributions of transport undertakings or trade unions (ZDH, TLN or ETF)

⁷⁵ Opinion of the High Level Group of Independent Stakeholders on Administrative Burdens of 4-5 March 2009 on transport.

by exemptions without negative impact on safety, internal market or working conditions. As an indication of the cost reduction potential of such measure, the Group's report indicates that the savings just for German brewers would amount to €15 million.

At the same time, other distance-based exemptions contained in Article 13 of the Regulation (EC) No 561/2006 vary between 50 and 150 km. Own analysis of the Commission indicates that these variations are not justified while they complicate the enforcement of social legislation.

Manual recording of data

Member States have different approaches when it comes to recording daily and weekly rest periods. Some consider periods where no activity has been recorded as "rest", some require however an attestation form to confirm this. As the tachograph currently records only driving times in an automated way, some Member States impose the obligation to fill in forms on drivers when a driver is not working, e.g. in case of holidays, due to illness or the driver's rest time exceeds 24 hours.⁷⁶ The EU acquis provides for a form which has to be recognised by all Member States.⁷⁷ According to the stakeholders in the Stoiber Group⁷⁸, this obligation is burdensome especially as those forms have to be signed by the driver and the employer and have to be kept in the truck for the last 28 days in original. The burden of this obligation would be reduced significantly by deleting the obligation to have the forms signed by the employer or accepting copies of the attestation forms. According to the estimates of the Group this proposal represents savings of around €184 million.⁷⁹

2.3.3.2. Technical limitations of digital tachograph devices

According to the stakeholders in the Stoiber Group⁸⁰, the devices for the digital tachograph currently allowed are technically outdated.

Downloading speed

The Internet stakeholder consultation⁸¹ indicated that the speed of regular downloading of data required by the legislation is an issue for the operators, although there is a feeling that "download speeds have increased considerably over time as newer devices have been introduced into the market [...] The importance of incorporating new technological advancements to further increase speeds on a rolling basis was stressed by many respondents."⁸² Low downloading speed is inevitably a source of cost for road transport

⁷⁶ A list of Member State where the form is mandatory is available on the following website: http://ec.europa.eu/transport/road/social_provisions/doc/forms/2007_form_attestation_of_activities_upd_ate2010.pdf

⁷⁷ Commission Decision of 14 December 2009 amending Decision 2007/230/EC on a form concerning social legislation relating to road transport activities, OJ L 330, 16.12.2009, p. 80–81

⁷⁸ Opinion of the High Level Group of Independent Stakeholders on Administrative Burdens of 4-5 March 2009 on transport.

⁷⁹ Ibid.

⁸⁰ Ibid.

⁸¹ http://ec.europa.eu/transport/road/consultations/2010_03_01_tachographs_en.htm, see in particular the contribution of transport undertakings (IRU, SAV, IRHA, FTA or DTF)

⁸² Summary of stakeholder consultation responses, http://ec.europa.eu/transport/road/consultations/2010_03_01_tachographs_en.htm

companies. According to the stakeholders in the Stoiber Group⁸³, the burden linked to this issue is estimated to an amount of €664 million.

On the side of controls, downloading time is a crucial element in determining the scope of the check. Responses collected in a questionnaire from Member States⁸⁴ indicate that, "with regards to roadside checks, the time employed for downloading data from a driver card ranges between 1 to 5 minutes.⁸⁵ Downloading data from digital tachographs is more time-consuming [...] [and] could typically range from 15 to 60 minutes."⁸⁶ Data stored in the digital tachograph is more complete and therefore gives a bigger chance to detect fraud, but the very long downloading time often pushes control officers to check only the driver's card.

Single-use of the device

Stakeholders⁸⁷ indicated that the cost of using the tachograph for the purpose of controlling driving time could be reduced if the tachograph was better integrated with other Intelligent Transport Systems (ITS) applications⁸⁸ to avoid duplication of processes and exploit potential synergies. In particular, it would make sense that the secondary source of motion information was the satellite positioning used for other purposes by the drivers. Article 2(3) of Directive 2004/52/EC on electronic tolls also explicitly refers to linkage between the on-board equipment used by electronic tolls and the digital tachograph. A recent study commissioned by the Commission recommended clearly that the digital tachograph should be used as "essential core telematics element in the ITS station of the vehicle concerned"⁸⁹.

As explained by the abovementioned report, exploiting these synergies is currently rendered difficult by the lack of a standardised interface ensuring interoperability between the tachograph and other ITS applications.

2.3.3.3. Insufficient efficiency of roadside checks for compliant drivers

Roadside checks are carried out randomly, which inevitably implies stopping a relatively high proportion of non-fraudulent vehicles.⁹⁰ Unfortunately, stopping the vehicle in order to carry out checks on driving times and rest periods takes a lot of time (see above) and the number of non-fraudulent vehicles stopped is quite high. In the absence of appropriate mechanisms to filter and target the road side checks, time spent on these checks means important costs for the non-fraudulent firms and the authorities concerned. Filtering of roadside checks could be done through a wireless signal from the digital tachograph indicating that most likely, there is a problem of compliance with the legislation. This signal would allow control officers to assess

⁸³ Opinion of the High Level Group of Independent Stakeholders on Administrative Burdens of 4-5 March 2009 on transport.

⁸⁴ Price Waterhouse Cooper, Analysis of the technical and organisational measures employed by Member States in the application of Directive 2006/22/EC, 2009.

⁸⁵ Information provided by the UK authorities to the Commission services

⁸⁶ Ibid.

⁸⁷ Notably IRU; see the results of the stakeholder consultation

http://ec.europa.eu/transport/road/consultations/2010_03_01_tachographs_en.htm.

⁸⁸ 'Intelligent Transport Service', meaning the use of Information and Communication Technologies (ICT) in transport.

⁸⁹ Study by Rapptrans on Specific action 4.1 of the ITS Action Plan, 2010.

⁹⁰ The 25th report of the Commission on the implementation of the social legislation relating to road transport suggests that the ratio between the number of offences detected and the number of vehicles checked varies considerably from country to country. On average, the ratio is somewhat less than 20%, meaning that 80% of the vehicles stopped were found to have committed no offence.

whether it would be interesting to stop a certain vehicle for further control during a roadside check.

2.3.3.4. Tachograph is not sufficiently facilitating drivers' work

Warning about data overwriting

The SMART project report⁹¹ indicates that the issue of accidental over-writing driver card data is seen as an issue by stakeholders from the sector. This point was in particular raised by CORTE and the International Road Union (IRU). As explained by the operators, according to the Annex 1B specifications, the driver's card has to be able to store at least data from 28 days worth of driving. However activities of a day are supposed to lead to 93 changes to be recorded by the tachograph. In certain sectors where frequent stops or changes in activity such as city deliveries occur, these 93 changes can be easily used up before the end of the 28 days. In these circumstances the earliest recorded data on the card risk to be overwritten and lost without any warning being given to the driver. It should be noted that it is not possible to define an overall minimum capacity which would guarantee that data are never overwritten. This poses a problem for legal compliance because in the event of a check the driver may not have in his possession all required records of his activities. The stakeholders involved in the SMART project suggested the amendment of the specifications so that the driver can receive a warning if the card has reached the limit of its memory and is about to start overwriting the data.⁹²

Positioning of the tachograph in the vehicle

According to the stakeholders as reported in the SMART report, "tachographs sometimes get placed in hard to reach areas in the driver's compartment, resulting in bad ergonomics and usability."⁹³ It might even be that the tachograph is installed in the glove box, which makes it difficult to see for instance the driving time or to take action in case of a warning. It was recommended in the stakeholder consultation for instance by the trade unions (ETF) to solve this problem by indicating in the legislation that the device should be placed in sight of the driver.

⁹¹ SMART DIGITAL Tachograph Project (Support, Maintain And Improve the Digital Tachograph), 2007.

⁹² Ibid.

⁹³ Ibid.

Table 1: Synoptic table of problems, drivers and problematic areas

Identified drivers	Problematic areas
Driver 1: The tachograph system is still vulnerable to manipulation and fraud	Seals do not properly perform as an indicator of tachograph manipulation Vulnerabilities of encryption technology Misuse of driver card Fraudulent or negligent workshops
Driver 2: Effectiveness of controls and dissuasive effect of sanctions	Non harmonised training of enforcement officers Scope of data from the digital tachograph available to enforcement officers Sanctions policy
Driver 3: The use of the tachograph system is not sufficiently optimised	Inadequate provisions of the Tachograph Regulation Technical limitations of the digital tachograph Insufficient efficiency of roadside checks for compliant drivers Tachograph is not sufficiently facilitating drivers' work

2.4. Who is affected, in what ways, and to what extent?

2.4.1. Drivers

Drivers of trucks and buses are the primary users of the tachograph. They are obliged to use it to carry out transport operations falling within the scope of Regulation (EC) No 561/2006. Their working conditions and standards decline if their firms do not comply with social legislation. If opportunities for fraud were reduced, employers could not exert pressure on drivers to circumvent social legislation and drivers could fully enjoy their rights as laid down in the social legislation.

2.4.2. Firms using the tachograph

Road transport firms are directly affected by competitors who gain an unfair advantage over them by circumventing social legislation. This means that the market shares held by firms which comply with the social legislation would decline, due to distortion of competition.

Poor user-friendliness of the tachograph has direct consequences on firms using the tachograph. Finally, certain categories of undertakings, although not having transport as main activity like for instance craftsmen, may have to bear an unnecessary administrative burden by being obliged to install and use the digital tachograph.

2.4.3. *Member States and inspection authorities*

Member States are legally obliged to enforce social legislation⁹⁴, and must therefore have adequately trained enforcement staff. However, these national inspection authorities are adversely affected if the system is not user-friendly and functioning in a sub optimal way.

2.4.4. *Tachograph manufacturers*

The current manufacturers of type-approved tachograph equipment are, of course, directly affected by the regulatory environment – as are other firms interested in developing such equipment.

2.4.5. *Citizens/road users*

All road users are put at greater risk of injury when road safety is compromised. This is particularly true of road traffic accidents involving vehicles weighing more than 3.5 tons, as injuries tend to be more severe than in other accidents⁹⁵.

2.4.6. *EU industry*

The European industries involved in ITS (the automotive industry, ICT industry, digital map service providers, etc.) will find it difficult to stay competitive on the world market if their technologies are not deployed.

2.5. **How would the problem evolve, all things being equal?**

The problems identified concern the tachograph system as a whole. The gradual renewal of the fleet will have the effect of increasing the importance of the problems related to the digital tachograph (for example the issue of data on the location of the day's start and end not being available to the controllers). It is estimated that by 2020, 80% of the vehicles covered by the Tachograph Regulation will be equipped with a digital tachograph⁹⁶, including almost the whole long-distance fleet where, due to the high yearly mileage, fleet renewal is faster.

The enter into force of the provisions of Regulation 1266/2009 on user friendliness of the digital tachograph and its increased resistance to "attacks" will mitigate the administrative burden (reduction of €234.5 million a year) on the one hand, and will reduce the relevance and importance of some vulnerability issues identified above (resistance to manipulation of the tachograph). On the other hand, time will aggravate the problems related to the encryption of data. In a recent report JRC estimated that without policy change, "[the security] mechanisms will shortly become obsolete and the overall [digital tachograph system] will suffer a decrease of its security level below the level currently requested by the legislation."⁹⁷ At the same time, technological progress will probably reduce the problems related to the speed of data download both at company premises and during roadside checks.

⁹⁴ See Directive 2006/22/EC.

⁹⁵ http://ec.europa.eu/transport/roadsafety_library/care/doc/safetynet/2007/bfs2007_sn-trl-1-3-hgvs_buses.pdf.

⁹⁶ Estimates based on the renewal of the fleet.

⁹⁷ JRC, Possible scenarios for the technical evolution of the digital tachograph system, as defined in the regulation EEC 3821/85, 2010.

The progressing economic convergence of EU-12 with EU-15 countries⁹⁸ will exacerbate the distortionary effect of the differences in sanctions⁹⁹, unless the latter are changed to better reflect the new situation. Indeed, it won't be possible any more to justify lower sanctions by lower earnings and wages. At the same time, Directive 2009/5/EC which harmonises the categorisation of offenses across the Union should have an indirect positive impact on the harmonisation of sanctions (in some Member states, the re-categorisation of some offenses could imply the re-adjustment of sanctions).¹⁰⁰

The data available to the Commission indicates that the use of the TACHOnet system is progressing at a rapid pace.¹⁰¹ This is notably the effect of the Recommendation on the use of TACHOnet issued by the Commission in January 2010¹⁰² inviting Member States to make a more frequent use of this tool and introducing a minimum service level agreement. This evolution will have a potentially big (proportional to the rise in the use of TACHOnet) positive impact on the level of detection of fraud related to the misuse of driving cards.

Finally, the exchange of best practice on the training of enforcement officers, as identified in the problem driver "Training of enforcement officers" above, might have some positive impact on the quality of training. This impact could however be limited given notably the low commitment to quality training on the side of Member States (see analysis above).

2.6. Does the EU have the right to act and is there a clear EU added value?

This impact assessment is concerned with measures to enhance the effectiveness and efficiency of the tachograph system used to ensure compliance with the social legislation. It explores and analyses options for revising Regulation (EEC) No 3821/85 which is based on Article 91 of the TFEU (former Article 71 of the EEC Treaty).. The EU added value was assessed when this Regulation was introduced and the arguments which substantiate this added value still hold.

These arguments are predicated upon the ever-increasing reality that road transport within the EU is transnational in nature. International road freight transport accounted for about one third (or 612 billion tkms) of total road freight transport in the EU in 2006. Data compiled by the European Commission shows that international road freight is an increasing proportion of this total.¹⁰³ This is because of increasing cross-border trade and economic growth, which have in part been facilitated by EU enlargement and the liberalisation of the road haulage industry in Europe. Social legislation in the road transport field is harmonised at EU level, and

⁹⁸ EU energy and transport in figures, Statistical pocketbook 2010, p. 11.

⁹⁹ See section 2.3.2, "Sanctions policy" and the Report from the Commission analysing the penalties for serious infringements against the social rules in road transport, as provided for in the legislation of the Member States, COM(2009)225.

¹⁰⁰ Although Directive 2009/5/EC requires Member States to comply with the new categorisation of offenses as soon as from the end of 2009, this directive has not directly consequences for the sanctions applied by Member States as the Directive concerns the categorisation of infringements and is used in several Member States primarily for the purpose of risk rating systems only.

¹⁰¹ In December 2010, 25 countries did not meet the minimum of 98 percent of answers; in February 2011, only 20 countries did not meet this threshold. See

http://ec.europa.eu/transport/road/social_provisions/tachograph/tachonet_en.htm.

¹⁰² Commission Recommendation of 13 January 2010 on the secure exchange of electronic data between Member States to check the uniqueness of driver cards that they issue, OJ L 9, 14.1.2010, p. 10–13.

¹⁰³ See for example figure 3.1.6 in European Commission (DG TREN), *Road Freight Transport Vademecum*, (March 2009).

verifying compliance with this legislation requires recording equipment to be interoperable between Member States. Given the increasingly transnational nature of road freight transport in the EU and the harmonised nature of social legislation, it would be counterproductive to revert to regulating recording equipment at national level — not least because this kind of regulation has been carried out at EU level for the past 25 years.

As regards sanctions, the Commission report on penalties¹⁰⁴ showed the divergences between sanctions applied by Member States for infringements against the tachograph regulation. It appears that not in all Member States, the sanctions foreseen for the manipulation of tachographs are categorised among the severest. Therefore, the sanctioning system in the EU is not regarded as dissuasive by those who manipulate tachographs in certain Member States. In a context where road transport is more and more international, the EU has already started to harmonise the definition and categorisation of infringements in an attempt to ensure a level playing field so that a company which commits an infringement in a country X has no competitive advantages or disadvantages compared with a company committing a similar infringement in a country Y. Hence, the manipulation of tachographs is already categorised by the EU legislation as one of "the most serious infringements" within the broader list of infringements to commercial road transport rules (see Regulation (EC) No 1071/2009). Such a classification without harmonising a minimum degree of deterring effect of sanctions imposed by Member States do not necessarily lead to a strict respect of rules as companies react to actual sanctions and not to the categorisation of infringements. The review of the Council Regulation (EEC) No 3821/85 to achieve its full effect could therefore introduce a minimum degree of harmonisation so that the manipulation of tachographs leads to the highest sanctions applied in the specific Member State in relation to commercial road transport.

3. OBJECTIVES

3.1. General Objective

The overall aims of road transport social legislation (the rules on driving time and rest periods) are to improve road safety and drivers' working conditions and to ensure fair competition between transport companies, contributing thereby to the good functioning of the Internal Market for transport services. The social legislation in road transport is therefore an essential element of the Common Transport Policy to attain Treaty's goals like improving transport safety (Article 91.1(c) TFUE¹⁰⁵), social progress (Article 3.3 TEU¹⁰⁶) and establishing an internal market (Article 3.3 TEU). The Tachograph Regulation is the main tool for monitoring and enforcing compliance with the social legislation in road transport, and the general goal of the proposals which accompany this IA includes the contribution to the abovementioned Treaty goals.

At the same time, the intention of the Commission is also to contribute to the goals set up by the Communication on Better Regulation for Growth and Jobs in the European Union¹⁰⁷ and

¹⁰⁴ COM(2009)225

¹⁰⁵ Treaty on the Functioning of the European Union

¹⁰⁶ Treaty on European Union

¹⁰⁷ Communication from the Commission, Better Regulation for Growth and Jobs in the European Union, COM(2005) 97 final

the Strategy for the simplification of the regulatory environment¹⁰⁸. The proposals should also contribute to the goal "to reduce administrative burden on companies, and improve the quality of business legislation" set down in the Europe 2020 flagship initiative "An industrial policy for the globalisation era".¹⁰⁹

3.2. Specific Objectives

Part 2.3 above has identified three problem drivers. The specific objectives of the proposed initiatives reflect this problem definition and are the following.

1. The first specific policy objective is to improve the trustworthiness of the recording equipment.
2. The second specific policy objective is to increase the efficiency of the checks of the social legislation in road transport.
3. The third specific policy objective is to reduce the costs related to the use of the recording equipment, notably by reducing the administrative burden related to its use.

3.3. Operational Objectives

In this context, the following operational objectives were chosen for their usefulness for indicating the level of achievement of the specific objectives:

- Eliminate the "most serious infringements"¹¹⁰ against tachograph rules by 2020 (monitored by the Commission on the basis of the future reports submitted by Member States for the bi-annual report);
- Double by 2020 the detection rate of infringements to the social legislation per vehicle controlled in a roadside check compared to 2008 (monitored by the Commission on the basis of the future reports submitted by Member States for the bi-annual report);
- Reduce the administrative burden related to the use of the digital tachograph by 20 % before 2020 compared to 2010 (based on the estimations provided by the Stoiber Group and the EU project on baseline measurements and reduction of administrative costs¹¹¹).

¹⁰⁸ Communication of the Commission, Implementing the Community Lisbon programme: A strategy for the simplification of the regulatory environment, COM(2005) 535 final

¹⁰⁹ Communication of the Commission, An Integrated Industrial Policy for the Globalisation Era - Putting Competitiveness and Sustainability at Centre Stage, COM(2010)614.

¹¹⁰ The most serious infringements are defined in Annex IV to Regulation (EC) No 1071/2009: "2. Not having a tachograph and/or speed limiter, or using a fraudulent device able to modify the records of the recording equipment and/or the speed limiter or falsifying record sheets or data downloaded from the tachograph and/or the driver card; (...) 6. Driving with a driver card that has been falsified, or with a card of which the driver is not the holder, or which has been obtained on the basis of false declarations and/or forged documents."

¹¹¹ Cap Gemini, EU project on baseline measurements and reduction of administrative costs, 2009

Some data concerning road transport is collected at an EU level and could be used for monitoring the impact of the proposed regulation on the specific objectives listed above.¹¹² Further arrangements are foreseen in section 7 to ensure a more accurate monitoring in future.

3.4. Consistency of the objectives with fundamental rights

Measures designed to meet the objectives will need to be in compliance with relevant fundamental rights and principles as embodied in the Charter of Fundamental Rights of the European Union. In particular, the measures aimed at reducing the number of drivers in fraud of social legislation and at integrating the tachograph with other ITS devices will need to take due account of the need to respect for private and family life (Art. 7), the right to protection of personal data (Art. 8) and the freedom to conduct a business (Art. 16). Particular attention should be given to the necessity and proportionality. Concerning sanctions, the fundamental rights provided for in Title VI Justice, in particular principles of legality and proportionality of criminal offences and penalties (Art. 49) and the right not to be tried or punished twice for the same offence (Art.50) are also important. The specific objectives as defined above, namely the improvement of road safety, internal market functioning and drivers' working conditions, could constitute general interest and therefore justify potential necessary limitations of the identified fundamental rights. However, any limitation on the exercise of these rights will have to be made clear in the future tachograph regulation and respect the essence of these rights and freedoms.

4. POLICY OPTIONS

The stakeholder consultation¹¹³ and the major reports on the topic allowed us to identify a broad set of individual measures having the potential to address the numerous problematic areas identified in the problems above. The following process was applied for generating from these possible policy measures the policy packages that will be analysed in later parts of the present report:

- Identify the policy measures which can be discarded on the basis of a first, preliminary assessment (see Annex VII). These policy measures were proposed in the stakeholder consultation or elsewhere but were discarded at an early stage of the impact assessment as unrealistic, out of scope or not bringing sufficiently high benefits in comparison to their costs.
- Draft a list of retained policy measures;
- Package those measures into policy options constituting viable policy alternatives for achieving the objectives.

4.1. List of retained policy measures

The table below is providing a mapping between the retained policy measures and the problematic areas identified in the problem definition above.

¹¹² Cf. notably Eurostat statistics and EU energy and transport in figures.

¹¹³ Internet consultation and SMART project.

The measures have been selected on the following basis. First, the measures had to cover all the components of the tachograph system (which consists not only of the vehicle unit and the driver cards, but includes the workshops, control officers, manual recordings etc). Second, the list of measures also had to take into account the suggestions of different stakeholders as expressed in the stakeholder consultation.

Table 2: Mapping between problem drivers, problematic areas and content of policy measures

Problematic areas identified in the problem definition	Policy measures	Content of policy measures
Driver 1: Vulnerability of the tachograph system		
<i>Insufficient quality of seals</i>	Higher quality seals	This measure would consist of mandating the European standardisation bodies to develop adequate standards for seals.
<i>Vulnerabilities of encryption technology</i>	More secure encryption technology	The measure would consist of creating a ten-year roadmap of amendments to the annexes of the Tachograph Regulation for updating the encryption requirements to the evolving threats. The roadmap would be presented to the industry – and notably to tachograph manufacturers – for better planning and therefore better investment strategy.
<i>Misuse of driver cards</i>	Make fraud with driver card more difficult	<p>This measure would include:</p> <ul style="list-style-type: none"> • Merging driver cards with the driving licences and the certificate for the initial and continuous training of professional drivers¹¹⁴. This would require a change to both Council Regulation (EEC) No 3821/85 and to the driving licence directive. • Mandatory and regulated participation of all Member States in TACHOnet.
<i>Fraudulent or negligent workshops</i>	More trustworthy workshops	<p>This measure would include:</p> <ul style="list-style-type: none"> • harmonising the requirements for workshop auditing across the EU, and • forbidding transport firms to calibrate their own vehicles

¹¹⁴ Directive 2003/59/EC of the European Parliament and of the Council of 15 July 2003 on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers, OJ L 226, 10.9.2003, p. 4–17

Driver 2: Effectiveness of controls and dissuasive effect of sanctions

Non harmonised training of enforcement officers

Better training of control officers

This measure would imply issuing guidelines on training standards and training practices for technical and enforcement staff.

Scope of data from the digital tachograph available to enforcement officers

Improved tachograph functions (automatic and manual recording)

This measure would imply:

- Clarifying that any period during which no activity is recorded should be considered as rest time to avoid the need to use paper attestation forms (Art. 13(1) of Directive 2006/22/EC);
- Requiring in the digital tachograph the automatic recording of the vehicles precise location at the start and end of the working day through GNSS¹¹⁵.

Sanctions policy

Minimum degree of harmonisation of sanctions

This measure would require Member States to apply sanctions with the highest available level within the commercial transport for most serious breaches (in line with the categorisation of infringements provided in the annex to Directive 2009/5/EC) of tachograph provisions.

¹¹⁵ Other variants for automated recording of location data have been discarded, see Annex VIII.

Driver 3: The use of the tachograph is not sufficiently optimised

Inadequate provisions of the Tachograph Regulation

Modernised rules on the use

This measure would imply:

- For the exemption "to carriage by vehicles or combinations of vehicles with a maximum permissible mass not exceeding 7.5 tonnes used for carrying materials, equipment or machinery for the driver's use in the course of his work. These vehicles shall be used only within a 50 kilometre radius from the base of the undertaking, and on condition that driving the vehicles does not constitute the driver's main activity" in Article 13(1)(d) of Regulation (EC) No 561/2006, extending the radius from 50 to 150 km; or
- Aligning the range for other distance based exemptions in Article 13 of Regulation (EC) No 561/2006 to 100 km (currently ranging from 50 to 100 km). This would concern for instance certain vehicles propelled by electricity or certain vehicles used for the carriage of live animals.

Technical limitations of the digital tachograph

Harmonised interface with other ITS applications

Define a standardised interface between the tachograph and other ITS applications, making the interface available to all new equipment manufacturers.

Insufficient efficiency of roadside checks for compliant drivers

The wireless communication for roadside checks

This measure would imply the mandatory fitting of vehicles equipped with tachographs with devices emitting a signal on the presence or absence of anomalies indicating possible fraud or non compliance with social legislation. The signal would contain only basic information to reduce the risk that it is affected by faults and that the privacy rights of drivers are affected. The signal would be readable – for instance in the form of green or red light – by adequately equipped enforcement officers performing roadside inspections.

Tachograph is not sufficiently facilitating drivers' work

Better interface with the users

This measure would imply:

- Providing in the digital tachograph a warning before data is overwritten and

-
- Requiring that the tachograph is positioned in the driver's direct field of vision.

Furthermore, the different measure can be linked to the different objectives as shown in the following table.

Table 3: Mapping between problem policy measures and objectives

Policy measure	Improve the trustworthiness of the recording equipment	Increase the efficiency of the checks of the social legislation in road transport	Reduce the cost related to the use of the recording equipment,
Higher quality seals	X	X	
More secure encryption technology	X		
Better interface with the users	X		X
Improved tachograph functions (automatic and manual recording)	X	X	X
The wireless communication for roadside checks		X	X
Harmonised interface with other ITS applications		X	X
Make fraud with driver card more difficult	X	X	X
More trustworthy workshops	X	X	
Better training of control officers		X	X
Minimum degree of harmonisation of sanctions	X	X	
Modernised rules on the use		X	X

4.2. Identification of policy packages

It is proposed to form packages of measures for the further assessment. Addressing at least several and not only individual components of the tachograph system (like vehicle units, cards, workshops, ...) is needed for at least two reasons:

- First in terms of security, the trustworthiness of the system depends on the security of many of its elements. For example, a highly advanced encryption technology would be useless if exotic devices tampering data could be installed and remain undetected in spite of seals.
- A second reason is related to the different levels of complexity of implementation. While certain technical measures can be grouped in a package implemented directly by the Commission through comitology (delegated/implementing acts), others more far reaching can be grouped in a package which will require changes adopted by the European Parliament and the Council.

Besides the baseline scenario (PP0), the following policy packages have been therefore designed in a way that ensures that each policy package is a true alternative option and is capable on a standalone basis to address all the problems identified but in a different way. As can be seen in table 3, the measures contained in each of the policy packages at least contribute to the achievement of the objectives.

- Policy Package 1 (PP1) would be a technical package aiming simply at improvements of the current (physical) tachograph device. It consists in updating to technical progress the technical specifications of the existing digital tachograph and in giving a mandate to the European Committee for Standardization (hereinafter "CEN") to standardise seals. It does not require a change of the regulation by the ordinary legislative procedure but only comitology decisions that can be taken by the Commission. To implement PP1, the Commission would need in practice only to publish a roadmap specifying the preparatory work to be done and to decide to give a mandate to CEN. No legislative proposal would be needed. PP1 would contribute to achieve the objectives in the following ways: higher quality seals and more secure encryption technology would improve the trustworthiness, higher quality seals would also improve efficiency of roadside checks (control officers would spot easier manipulations), and the better interface with users would reduce costs related to the use of recording equipment.
- Policy Package 2 (PP2) would also be a package of technical measures but which would substantially widen the functionalities of the digital tachograph which would lead to a new type of digital tachographs. It would consist of the measures in PP1 and would add new functions to the digital tachograph like automatic recording of the location at the start and end of the day or wireless communications. It would require that the Commission adopts a roadmap of implementing measures like in PP1. But it would also require a change of the regulation by the ordinary legislative procedure as the Commission has not been empowered to change the functionalities of the tachograph but only to adapt its technical specifications to technical progress. PP2 would contribute to achieve the objectives in the following ways: automated recording of location data would make fraud more difficult and hence improve the trustworthiness, it would also improve efficiency of roadside checks as control officers could more easily cross-check the information on driving times, and it would reduce costs as the automated recording would replace the current manual recordings. The wireless communication would further improve efficiency of roadside checks which could be more targeted.
- Policy Package 3 (PP3) would combine the technical measures of PP1 with measures aimed at improving the tachograph system as a whole: modernised rules on the use, more trustworthy workshops, making fraud with driver cards more difficult, minimum degree of harmonisation of sanctions and better training of control officers. The exclusion of the more costly technical measures of PP2 (such as automatic recording of the location of the vehicle at the start and the end of the day or wireless communication for roadside checks), which require considerable investment in equipment, makes PP3 a possibly lower cost alternative to PP2 and PP4 which is described below. PP3 would require a change of the regulation by the ordinary legislative procedure. It would contribute as described above to the achievement of the objectives.
- Policy Package 4 (PP4) would be a combination of technical and system improvement measures (PP2+PP3). Like in PP2 it would require a change of the regulation by the ordinary legislative procedure and the adoption of a roadmap of implementing measures. It would also contribute to all of the objectives, as explained above.

The table below sums up the measures included in each policy package.

Table 4: Detailed content of Policy Packages

	Policy Package 1 (PP1)	Policy Package 2 (PP2)	Policy Package 3 (PP3)	Policy Package 4 (PP4)
<i>Legal instrument(s)</i>	Roadmap on adaptation of technical specifications	Roadmap on adaptation of technical specifications Review of Regulation 3821/85 to add new functional requirements	Review of Regulation 3821/85 only to add new rules on the use and inspection of tachographs	Roadmap on adaptation of technical specifications Review of Regulation 3821/85
<i>Content of Policy Packages</i>	Encryption technology Seals Interface with the users	PP1 + The tachograph functions (automatic and manual recording) The wireless communication for roadside checks Interface with other ITS applications	PP1 + Workshops Driver cards Sanctions Training of control officers Rules on the use	PP2 + PP3

5. ANALYSIS OF IMPACTS

The analysis provided in this Impact Assessment report is based on the best available data and information collected by the Commission from stakeholders, Member States and the literature. However, data remains incomplete across the sector, in particular as regards the number and type of tachograph frauds. This is due in particular to the standard format used by Member States to submit information for the bi annual reports on the application of social legislation (see in this respect section 2.2.1. and chapter 7). In addition, some information being by nature confidential has been submitted to the Commission on an informal basis only. This situation is mainly due to the absence of an official channel for collecting-reporting-compiling misuses and infringements country by country.

5.1. Impact on the compliance with social legislation

One of the most important impacts of the policy packages envisaged above is related to the compliance of professional drivers with social legislation. The assessment of such an impact is a key element because enhanced compliance with social legislation has a number of consequences across the three economic, social and environmental pillars such as internal market, working conditions of drivers and road safety. For this reason, the compliance with social legislation will be assessed in a first place; the subsequent effects of increased compliance will be analysed in a second stage using the traditional three-pronged approach.

PP1 (encryption technology, seals, interface with the users)

This policy package addresses mainly the issue of concealment of the proof of non-compliance with social legislation. In particular, standardisation of the requirements on seals at a relatively high level will facilitate the detection of manipulation of tachographs by enforcement officers and workshops, and in particular of the installation of exotic devices which leave the seals broken. Similarly, constant updating of outdated encryption systems and minimum security standards will allow keeping within acceptably low limits (its elimination is never possible) the possibility to alter the data encoded by the tachograph on the driver's card before they can be controlled. Finally, the warning about the overwriting of data on the driver's card will reduce the possibility for the drivers to explain lack of data essential for the control by inattention.

The enhanced technical performance of the device in PP1 will increase the cost for the driver of circumventing social legislation and also will improve the detection of frauds. It can therefore be concluded that the compliance with social legislation is likely to improve under PP1 compared to PP0.

Given that technical improvements of the device take a rather long time due to the long lifetime of vehicles (average lifetime of 8 years), the positive effect of PP1 on the compliance with the social legislation will be gradual, except for improved seals which would be implemented quickly through the inspection of the equipment carried out every two years.

Nevertheless, it can be said that PP1 will increase compliance only for those vehicles which are in fraud on the Tachograph Regulation (problem of concealing the proof of non-compliance), which would represent – according to the estimations in part 2.2 – less than half of all the vehicles in breach of social legislation.

Envisaged policy measures leave relatively high flexibility to the concerned actors (for instance it is left to CEN to define the necessary level of quality of seals) and concerning the exact content of the initiative (for example in the definition of the roadmap for progress on encryption), which makes quantification of the effects impossible.

PP2 (PP1 + improved tachograph functions, wireless communication for roadside checks, harmonised interface with other ITS applications)

In addition to those contained in the PP1, this policy package contains two measures which will increase the effectiveness and efficiency of the roadside inspections. Wireless communication of basic data from the truck to the enforcement officer, with no need to stop the vehicle, will in principle increase the number of non-compliant drivers which can be detected per control officer, as time-consuming checks will be mostly targeted to vehicles presenting an anomaly.

The automatic recording of the place of start and end of the working day – according to opinions collected from enforcement organisations – will shorten the time necessary to check compliance with legislation, therefore also increasing the number of vehicles which can be checked per enforcement officers.

The exact potential increase in the number and pertinence of checks is difficult to establish on the basis of the available data. However, given that the average ratio is of 9 vehicles in breach of the social legislation out of 100 controlled (see part 2.2), the impact of the wireless communication in terms of detection of non-compliance can be great and, depending on the performance and use of the tool, can range from a small- up to a tenfold increase. Of course,

the impact will depend on the willingness of Member States to equip their control officers with necessary receivers.

The additional measures contained in PP2 seem mostly complementary to the ones already contained in PP1. Indeed, they address the issue of effectiveness of controls while PP1 concentrates on the recording equipment. While there is some overlapping (notably seals standardised at a high quality level contribute to the effectiveness of inspections at roadside and in workshops), the added value of PP2 over PP1 is important.

Like for PP1, given that technical improvements of the device take a rather long time due to long lifetime of vehicles (average lifetime of 8 years), the positive effect of PP2 on the compliance with the social legislation will be gradual.

PP3 (PP1 + more trustworthy workshops, cheaper and more trustworthy driver cards, minimum degree of harmonisation of sanctions, better training of control officers, modernised rules on the use)

Additional measures contained in this package – in comparison to PP1 – address the issue of concealing evidence of fraud and, at the same time, help enhancing the quality and effectiveness of controls.

Experience with the analogue tachograph has proven that fraud in workshops can be an important problem, with over 30% of them having been involved in fraudulent operations (see part 2.3 above). Moreover, workshops can be of essential help to fraudulent drivers and operators, since they are in a position to facilitate the elimination of uncomfortable recordings. At the same time, the effectiveness of better audits is difficult to evaluate on the basis of available evidence (quality problems in different Member States are known to the Commission only through informal discussions with stakeholders). The Commission must conclude that the effect of this measure can range from small to a considerable effect.

The effects of the separation of transport companies from the workshops are much clearer to foresee, since the incentives for the workshop not to play its supervisory role over own trucks are more than clear. However, such collusion has been reported to the Commission only about Germany and the effects of a formal ban in European legislation would be probably mainly affect this country.

Merging the card with the driver's licence has been identified in the course of the stakeholder's consultation¹¹⁶ as a solution for reducing fraud potential while at the same time limiting costs (issuing and purchasing of one instead of two documents). Driving licences and driver cards are issued in credit card format and contain very similar information (driver's details, photograph, etc). The driving licence directive¹¹⁷ already provides for the possibility of inserting a microchip in the standardised driving licence format. Moreover, both cards have a limited validity period of five years, since the driving licence directive stipulates that, as from 19 January 2013, the licences of truck and bus drivers will be valid for five years.

¹¹⁶ See for instance the contributions of certain Member States or transport undertakings (IE – Road Safety Authority, LU – Luxembourg Ministry of Sustainable Development and Infrastructure, or FTA)

¹¹⁷ Directive 2006/126/EC of the European Parliament and of the Council of 20 December 2006 on driving licences, OJ L 403, 30.12.2006, p. 18–60

Finally, the certificate for the initial and continuous training of professional drivers¹¹⁸, which is also issued for five years,¹¹⁹ could also be integrated into this document, thereby reducing costs even more. Merging cards would therefore not require any change in the period of validity of the current tachograph cards and therefore of their durability (as they are handled on a daily basis unlike driving licence cards). Merging driver cards with driving licences would facilitate detection at the roadside check of drivers using a card that does not belong to them or using two cards; however, this detection is already possible, so the impact would from that point of view not be huge. What contributes however to the reduction of fraud is the fact that driver's will be less inclined to let other drivers use their driving licence to fraud the tachograph system.

Similarly, given the fact that only two Member States are still not connected to TACHOnet and that exchange of data increases from month to month, making the use of TACHOnet mandatory will have a limited though positive effect on the detection of driver's card fraud.

Sanctions have a strong deterrent effect on drivers envisaging the breach of legislation, and are a potentially very effective tool in limiting the utility of non-compliance.¹²⁰ However, due to subsidiarity considerations, the level of harmonisation of sanctions foreseen by the Commission is relatively modest. The Member States will indeed retain the right to fix the level of highest fines (which currently can be as low as €8.23 – see part 2.3 above). Also, requirements for sanctions for less serious breaches of social legislation will not be regulated. The effect of the measure will therefore be limited, but it could be seen as a first step on the way towards more approximation in the future.

Finally, given the variations in the quality of training observed today (cf. part 2.3 above), the impact of more harmonised and overall higher training standards for enforcement officers can be expected to be high. The potential of this measure can be estimated on the basis of the example of the UK, where apparently better trained 258 officers are able to perform the same tasks as sufficient to carry out a comparable number of checks to those performed by much more numerous officers in France (3500) or Germany (5937).¹²¹ However, the impact of the measure is made uncertain by the fact that it will take the form of guidelines and will therefore not impose the obligation of better training on Member States.

The measures added to policy package 3 in comparison to PP1 are mostly not overlapping between themselves, since they address complementary elements of the tachograph system, in this case roadside checks, sanctions and workshops. Their joint effect can therefore be, for the simplicity, assumed to be close to the sum of their individual effects.

The overlap is higher but still limited between these measures and those contained in PP1. In particular, better and more reliable seals will make it more difficult to disguise fraud, which will limit the impact of better workshop auditing. On the other hand, the effect of more

¹¹⁸ Directive 2003/59/EC of the European Parliament and of the Council of 15 July 2003 on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers, OJ L 226, 10.9.2003, p. 4–17

¹¹⁹ Article 8 of Directive 2003/59/EC of the European Parliament and of the Council of 15 July 2003 on the initial qualification and periodic training of drivers of certain road vehicles for the carriage of goods or passengers, amending Council Regulation (EEC) No 3820/85 and Council Directive 91/439/EEC and repealing Council Directive 76/914/EEC, OJ L 226, 10.9.2003, p. 4–17

¹²⁰ Cf. Annex II for a more detailed economic analysis of the utility of non-compliance with legislation.

¹²¹ Cf. part 2.3 above.

reliable seals will be reinforced by the higher quality of training of the officers which inspect them. Overall, measures contained in PP3 are largely complementary and the added value of PP3 over PP1 is considerable.

Moreover, PP3 contains many non-technical measures that can be implemented more rapidly than in the two previous policy packages and its effects on the compliance with social legislation will be felt sooner than in PP1 and PP2.

PP4 (PP2 + PP3)

This package, which encompasses all the possible measures identified, will allow the highest increase in compliance to social legislation in road transport. However, the joint effect of the package will be affected by a number of foreseeable overlaps. Most notably, more harmonised sanctions which better reflect the gravity of infringements will have a deterrent effect, but so will the knowledge of the existence of targeted checks based on wireless communication foreseen in PP2. The joint effect of the two measures will therefore be lower than the sum of their individual effects.

At the same time, other measures contained in PP3 will have a reinforcing effect on PP1 (as seen in the analysis of PP3 above) and PP2. Better training of enforcement officers is essential for their ability to make use of the wireless communication at roadside checks. Evidence available to us is not sufficient to determine which of the two effects (reinforcement or overlap) will dominate.

Conclusion

In light of the above, it can be concluded that PP2 and PP3 are more effective than PP1 in increasing the level of compliance with social legislation in road transport. Given the scarcity of quantitative data and the difficulty to estimate precisely the effects of several foreseen measures such as training of enforcement officers or approximation of sanctions, it is impossible to conclude which package out of PP2 and PP3 will bring the highest increase in compliance level. However, since the non technical measures of PP3 will have a more immediate effect than both PP1 and PP2, it can be safely said that PP3 will increase compliance with social legislation faster than the two first packages.

PP4, which includes all the proposed measures, is likely to bring the most pronounced and balanced in time effect on the compliance with the social legislation.

5.2. Economic impacts

5.2.1. Impact on the functioning of the internal market and competition

The suboptimal functioning of the internal market and the distortions of competition between road transport undertakings have been identified as one of the major problems in section 2.2 above. This problem results directly from the fact that many undertakings and drivers are gaining competitive advantage from the fact that they don't comply with European social legislation on driving and resting times. Therefore, the impact of the policy packages on the functioning of the internal market and competition will be proportional to their effectiveness in reducing the level of non-compliance with social rules.

The impact of the policy packages on the costs for road transport will be marginal if noticeable at all given the relatively low cost impact of the proposed measures in the overall

cost structure of road transport and possible benefits for undertakings through the reduction of administrative burden. The cost impact for road transport undertaking is more than offset by the benefits for them in terms of reduced administrative burden. Section 5.2.3 has estimated that such benefits (after the deduction of costs) would be in the range of €142 million to €515.5 million depending of the policy package. Considering that the turnover of the road transport sector was in the order of €399 billion¹²²; the impact would therefore represent at most an efficiency gain representing 0.13% of the turnover of the sector. This is modest and is likely to impact positively the profit margin of the sector rather than decreasing road haulage costs for end-users.

Following the introductory analysis presented above PP2 and PP3 will have a stronger positive impact on the functioning of the internal market than PP1. PP3 and the non-technical measures it contains have a high potential for enhancing the functioning of the internal market, but also a strong uncertainty attached to it. Finally, PP4 will have the highest impact on the internal market, but whether it will be equal, higher or lower than the sum of the impacts of all the measures that constitute it cannot be determined in a certain way on the basis of available evidence.

5.2.2. *Impact on competitiveness*

There are two ways in which proposed legislation can impact the competitiveness in Europe. First, through increasing the scope of applications and the technical complexity of the tachograph (for example by facilitating the use of ITS applications), it can increase the competitiveness of the European tachograph manufacturing industry which is a world pioneer and leader.¹²³ Second, it can affect the competitiveness of road transport undertakings and workshops. In this respect:

PP1, which requires a technological and technical upgrade of the tachograph, can increase the competitiveness of the tachograph manufacturers. In particular, European manufacturers are likely to benefit most from the changes first introduced on their home market.

The technological upgrade brought by PP2 is considerably higher than the one of PP1. Especially the measure on wireless communication will create a new market for compatible equipment for enforcement officers, while the creation of an open interface with other ITS applications will open the perspective of new business for solutions exploiting the synergies between the latter and the tachograph.

The measures on workshops contained in PP3, and notably the explicit ban on running a workshop business by transport operators might negatively affect the competitiveness of concerned undertakings. However, eliminating distortions between workshops related to illicit business practices will have an overall positive effect on the competitiveness of the sector. Also the amended/extended exemptions from the obligation to install a tachograph for companies for which transport is not a primary business will positively affect their competitiveness. These impacts come on top of those of the measures already contained in PP1.

PP4 will combine and sum the effects (mostly positive) of all the other options in terms of competitiveness.

¹²² 2007 figures, see EU Energy and transport in figures, 2010

¹²³ JRC, Report on the vulnerability and controllability of the digital tachograph, 2010

The effect of the policy packages on the competitiveness of European road transport undertakings against those established in neighbouring countries will be limited for two reasons. First, road transport is nationally fragmented because of its nature and because of relatively protectionist legislation on cabotage; second, since 2010 the Tachograph Regulation applies equally to the other AETR countries, which include most of EU's closest neighbours.

In line with the Small Business Act¹²⁴ and its recent review¹²⁵, it is important to ensure that the impacts on small and medium enterprises (SMEs) are thoroughly analysed in the impact assessment and taken into account in all relevant legislative and policy proposals, with a clear indication of quantified effects on SMEs, whenever possible and proportionate. Most of the undertakings in the road transport sector are SMEs, and therefore this requirement seems of particular importance for the legislation proposed here. The competitiveness assessment provided above does not seem to indicate major negative impacts for SMEs – apart from the potential impact on workshops also running transport companies. However, according to information on the approved workshops, this impact is limited geographically to one country (Germany). The measure is also strongly justified by the conflicts of interest which could push concerned workshops not to play their role of inspectors in relation to their own drivers.

As explained in section 5.2.1. the benefits for the companies related to the introduction of the new equipment compensate largely the small costs for all the policy packages. This applies to all sectors using vehicles equipped with tachographs. Consequently, the analysis of impacts does not differentiate between different sectors, as for example postal operators or online services which would also benefit from the proposal.

The impact on SMEs in terms of administrative burden is more relevant and is analysed under a separate heading below.

5.2.3. *Impact on the administrative burden and the SMEs*

The reduction of the administrative burden related to the use of the tachograph has been identified as one of the major problems to be addressed in part 2 above. In order to determine the potential of each policy package to address this problem, we started by analysing the individual impacts of all the considered measures.

The details behind the calculations of the impact on administrative cost and administrative burden, including the respective Standard Cost Model, are attached in Annex III. To simplify matters (and notably to avoid the distinction between the analogue and digital tachograph), the calculations were made with a time horizon of after 2020 when the whole fleet, i.e. 6 million vehicles, will be equipped with digital tachographs. The measures with most important impacts and the value of these impacts are indicated in the following table.

The costs related to the necessary equipment is already included in the estimated reduction of administrative burden (see Annex III)

¹²⁴ Communication from the Commission, “Think Small First” - A “Small Business Act” for Europe, COM(2008) 394 final

¹²⁵ Communication from the Commission, Review of the "Small Business Act" for Europe, COM(2008) 394 final

Table 5: Main impacts on administrative cost

Measure	Administrative cost change (€million)
<i>Workshop auditing</i>	+20 ¹²⁶
<i>Merging driver cards with the driving licence</i>	-100
<i>Improved tachograph functions requiring automated recording of the precise location using GNSS</i>	- 349
<i>Using wireless communication to filter roadside checks</i>	-34.5
<i>Review the scope of the use of tachographs</i>	-52
TOTAL	-515.5

Moreover, the requirements induced as a consequence of the roadmap on encryption – notably the need to type-approve tachographs respecting the new encryption standards – would entail some administrative costs for tachograph manufacturers. However, these costs would be negligible (The Impact assessment on type approval for agricultural vehicles¹²⁷ puts the cost of a type approval at €15 000).

The above figures would entail that PP1 would lead to no reduction in administrative burden¹²⁸, PP2 would allow reducing the administrative burden by €383.5 million, PP3 by €142 million and PP4 by €515.5 million.

A large majority of road transport companies – and users of the tachographs – are SMEs. The impacts of reduction of the administrative burden presented above would therefore be mainly felt by SMEs.

While PP1 does not contain measures which would have a specific impact on SMEs, it is the case for PP2, PP3 and, by consequence, PP4. As bigger firms are able to benefit from economies of scale, it is by comparison more difficult for small road transport businesses to handle the driver cards and to deal with checks than for bigger firms. Merging the driver card with the driving licence (PP3 and PP4) and filtering roadside checks (PP2 and PP4) will therefore improve the position of SMEs. It will also be SMEs, for instance craftsmen, who benefit most from reconsidering when the tachograph needs to be used (PP3 and PP4).

5.2.4. Budgetary impact on public authorities

The proposed legislation – depending on the Policy Package chosen – will have more or less important budgetary implications on public authorities at the different levels. In order to assess these implications, we proceed in the same manner as for the analysis of the effects on

¹²⁶ The calculation in Annex III lead to the figure of €20 million, but they are made under the unrealistic assumption that no audits are performed today. The additional cost of better auditing should therefore be in reality lower than this amount.

¹²⁷ SEC(2010)933.

¹²⁸ The increase of the administrative burden related to type approval is negligible.

administrative burden, which is first to identify the impacts of single measures, and then to compile these costs for each Policy Package.

The measures with most important impacts on public budgets, the value of these impacts and the concerned administration level are indicated in the following table.

Table 6: Main budgetary impacts on public authorities

Measure	Concerned administration level	Budgetary impact
<i>Harmonising the requirements for workshop auditing</i>	National	€ million ¹²⁹
<i>Wireless communication for roadside checks</i>	National	0 - €7 500 000 ¹³⁰
<i>Developing standards for seals</i>	European (CEN)	Small
<i>Mandatory participation of all Member States in TACHOnet</i>	National (Portugal and Denmark)	?
<i>Sanctions</i>	National	Positive but difficult to estimate ¹³¹
<i>Minimum training standards</i>	National	€30 million ¹³²

PP1 will only have a minor cost implication for the European Committee for Standardisation (CEN). PP2 – and in particular the measure on wireless communication for roadside checks, will imply additional costs to national administrations related to equipping the enforcement officers with devices necessary for receiving and decoding the signal from the vehicle. As the purchase of this equipment will not be made mandatory by the legislation, and as potentially existing infrastructure for the control of tolling schemes could be used for that purpose, the final cost will depend on the number of officers who will receive it and the infrastructure already available, and will range between 0 and €7 500 000.

PP3 will imply costs for administration related to the mandatory participation of Member States to the TACHOnet system (unknown, but concerning only Portugal and Denmark) and to the enhanced training of enforcement officers. The latter cost might be significant for those Member States where currently training of enforcement officers is given low priority.

¹²⁹ Rough estimation made under the assumption that the costs for auditing are of €1000 per workshop (90 000 workshops).

¹³⁰ This figure reflects the cost of equipping an adequate number of enforcement officers, enforcement vehicles and fixed infrastructure gantries, with compatible receivers of signals generated by the tachograph. The calculation is based on an average cost of 4.000 € (estimated by JRC) for a receiver, being either fixed, or mobile. Given the way controls are generally organised, it is not necessary that every control officer is equipped with this equipment. Based on the figures in Price Waterhouse Cooper, Analysis of the technical and organisational measures employed by Member States in the application of Directive 2006/22/EC, 2009, it is assumed that 1750 receivers (indicatively 150 enforcers' vehicles, 350 fixed on gantries and 1250 smart portables) could be sufficient.

¹³¹ The foreseen overall increase of sanctions will result in increased revenues from fines. This will partly be offset by increased compliance as a result of increased cost of breaching the law.

¹³² This is a gross estimation and is provided only for indicative purposes.

According to a recent study¹³³, the cost of a training officer can be estimated to be between €900 and €1000. Retraining of all 30 000 officers can therefore cost around €30 million. However, as the measure foresees only issuing guidelines, the cost will depend on the number of Member States which will comply. Harmonised and enhanced rules on the auditing workshops will increase their costs, which we estimate at approximately €10 million. This burden will be unevenly spread across different Member States, depending on the number of workshops – which can be very different even for countries of similar size, like France (493) and Germany (4176), the level of retribution of auditors and other costs, and finally the current level of quality of auditing. For illustrative purposes, the table below provides an estimation of the total costs of auditing of the workshops in each Member State.

Table 7: Number of workshops and cost of audits per country (data missing for Austria, Malta, Greece and Sweden)

Member State	Number of workshops	Annual audit cost (€)	Member State	Number of workshops	Annual audit cost (€)
<i>Belgium</i>	209	459800	<i>Latvia</i>	11	24200
<i>Bulgaria</i>	97	213400	<i>Lithuania</i>	38	83600
<i>Cyprus</i>	6	13200	<i>Luxembourg</i>	20	44000
<i>Czech Republic</i>	80	176000	<i>Netherlands</i>	968	2129600
<i>Denmark</i>	143	314600	<i>Poland</i>	393	864600
<i>Estonia</i>	16	35200	<i>Portugal</i>	45	99000
<i>Finland</i>	132	290400	<i>Romania</i>	228	501600
<i>France</i>	493	1084600	<i>Slovakia</i>	22	48400
<i>Germany</i>	4176	9187200	<i>Slovenia</i>	29	63800
<i>Hungary</i>	125	275000	<i>Spain</i>	452	994400
<i>Ireland</i>	89	195800	<i>United Kingdom</i>	398	875600
<i>Italy</i>	1029	2263800			

PP3 should also generate additional revenues for the national authorities from increased fines (measure "sanctions"). This effect will be partly offset by higher compliance as a result of increased cost of breaching the law.

Finally, PP4 will induce the highest costs for public administrations as it will sum the costs identified under all the options.

5.2.5. Impact on specific regions

As identified in the problem definition, some countries present socioeconomic characteristics which increase the incentives for companies and drivers to breach social legislation. These are the countries with high driver wages (mainly EU-15 countries, in comparison with EU-12). The impact of the proposed legislation for undertakings and drivers coming from these countries can be expected to be higher.

Given the principle of extraterritoriality foreseen by article 19(2) of Regulation (EC) No 561/2006¹³⁴, the current differences in the level of sanctions can play a role in the importance

¹³³ Price Waterhouse Cooper, Analysis of the technical and organisational measures employed by Member States in the application of Directive 2006/22/EC, 2009.

¹³⁴ This principle means that when an infringement is detected by the competent authorities in a Member State and no penalty has already been imposed for that infringement, the competent authorities are enabled to impose a penalty even where the infringement has been committed on the territory of another Member State or of a third country. Due to the principle of non discrimination, the penalty has to be the same as if the infringement had been committed on the territory of the Member State that had detected

of impacts of more harmonised sanctions (PP3 and PP4) for drivers **which pass through the territory of some countries** (in comparison to "for undertakings and drivers coming from these countries" mentioned above). This effect can be expected to be higher for countries where today's sanctions can be seen as less repressive: those whose legislation provides for fixed fines, those which do not foresee the possibility of immobilising the vehicle or imprisoning the driver, and finally those which do not foresee rising penalties for recidivists.¹³⁵

Finally, the impacts which affect the transport sector will be felt stronger by Member States in which this sector is well developed (such as Germany, Poland, Spain, the Netherlands) and where it constitutes an important share of economic activity (notably Germany, Poland, the Netherlands, Romania, Lithuania, Czech Republic).¹³⁶

5.3. Social impacts

5.3.1. *Impact on working conditions, health and lifestyle of drivers*

This section analyses the impact assessment of the various policy packages on working conditions. It should be underlined that working conditions s one of the objectives of the legislation on driving times and rest periods as stipulated in Article 1 of Regulation (EC) No 561/2006: "This Regulation lays down rules on driving times, breaks and rest periods for drivers engaged in the carriage of goods and passengers by road in order to [...] improve working conditions and road safety." Better compliance with these rules should therefore lead to improved working conditions for drivers.

In light of the results of studies referred to above, it can reasonably be said that improved working conditions have also positive spill over effects on health and lifestyle of professional drivers.

It is to be reminded at this stage, as highlighted above, that data concerning compliance with the social legislation is scarce and, for this reason, the analysis of the effects of the policy packages on working conditions, health and lifestyle is qualitative.

The impact of the various policy packages on working conditions, health and lifestyle has been assessed following a two-step approach.

Indirect effect of increased compliance with social legislation

The enhanced compliance with social legislation in all the policy packages (except the baseline) will improve generally speaking the working conditions of professional drivers through shorter working and driving time.

the infringement. (Cf. Report from the Commission analysing the penalties for serious infringements against the social rules in road transport, as provided for in the legislation of the Member States, COM(2009)225)

¹³⁵ The system of sanctions across the Member States is very complex, and it would be difficult to classify them on a simple scale from less to more repressive. For a more detailed analysis, refer to Report from the Commission analysing the penalties for serious infringements against the social rules in road transport, as provided for in the legislation of the Member States, COM(2009)225.

¹³⁶ For more detailed info, Cf. DG MOVE, Road Freight Vademecum, Issue N°1.

In light of the results of the analysis of impacts on the compliance with social legislation, PP2 and PP3 will have a stronger positive induced effect than PP1. Both PP1 and PP2 have in this respect the disadvantage of being affected by the technical nature of their measures: the effects of the latter on working conditions will only be gradual and follow the pace of fleet renewal. PP3 and its non-technical measures have a high immediate potential, but its impact also bears the highest degree of uncertainty due to the scope of discretion left to Member States in the application of the proposed measures. For this reason, as well as because the amount of quantified data available is small, it is difficult to conclude which package out of PP2 and PP3 will bring the highest benefits for drivers. PP4, which combines the measures contained in PP2 and PP3, is likely to bring the most balanced in time and pronounced benefit on working conditions of drivers.

Direct effect of technical improvement of the device

The composition as such of each policy package will have a direct influence on working conditions, health and lifestyle thanks to policy measures facilitating drivers' work and/or reducing the quantity of work for drivers. This is particularly the case of the technical measures introduced by PP1, PP2 (and therefore also present in PP3 and PP4). However, since those effects are exclusively associated with technical improvement of the device, they will be introduced only gradually.

The measure on the more suitable positioning of the tachograph inside the cabin contained in PP1 is expected to facilitate the operation of the device by the driver and also accessibility for control officers. Similarly, the warning about data starting to be overwritten will eliminate the need for the driver to check this element himself. In addition to these elements, the measure "Wireless communication for roadside checks" contained in PP2 will reduce the number of unnecessary stops for compliant drivers and reduce the stress attached, thus bringing some small additional benefit to the measures contained in PP1. PP3 does not seem to bring any direct benefits additional to the ones brought by PP1 in terms of working conditions, health and lifestyle of drivers. Direct benefits of PP4 will be the same as of PP2.

Conclusion

PP1 mostly affects the working conditions, health and lifestyle of the drivers and enforcement officers by optimising the user-friendliness of the tachograph. This impact will be relatively small, but applicable to 6 million drivers and over 30 000 enforcement officers. For PP2 and PP4, the indirect impact through better compliance with social legislation is dominant, although PP2 will also slightly reduce stress exposure thanks to less frequent checks.

5.3.2. Impact on road safety

It should be underlined that road safety is also one of the main objectives of the social road transport legislation, as explained above. The improvement of compliance with social legislation should normally lead to improvement of road safety, which can be explained as follows.

As for the impact on working conditions, health and lifestyle, the impact assessment of the various policy packages on road safety has two components.

First, enhanced compliance with the social legislation helps generally speaking to reduce the risks of drivers becoming involved in fatigue-related accidents and thus improves road safety.

As indicated in a recent report undertaken for the Commission¹³⁷, both early and more recent studies and reviews on the effects of long working hours on accident risk indicate that the accident risk increases with an increase in hours worked per day and per week. This increase is exponential beyond the 7th, 8th, or 9th hour worked per day. As a result, the accident risk after 12 hours of working is twice as high as after 8 hours.¹³⁸

The above results – applied to the road sector – indicate the importance of better compliance of drivers with social legislation for increasing road safety. The huge cost of accidents caused by tired drivers of commercial vehicles (see part 2.3 above) indicates considerable potential to reduce social costs in this field.

Second, better placement and easier use of the tachograph in the cabin will help drivers to handle the device in a more convenient way, which would also reduce the risk of accidents due to distraction of the driver.

It is not possible, on the basis of available evidence, to quantify the exact impact of each policy package. In line with the above analysis of the effects on compliance with social legislation, the effects of measures contained in PP1 and PP2 are likely to take effect gradually as the existing fleet is replaced. Moreover, the effect of PP2 will be greater than the one of PP1. Technical changes to the tachograph – including its better positioning in the cabin (all policy packages) and better integration with other ITS applications (PP2 and PP4), will also increase road safety by facilitating the operation of electronic devices during driving. The effect of the non-technical measures in PP3 will be felt immediately and be potentially high, but very dependent on the way in which it is applied by Member States. Finally, PP4 is expected to bring the highest benefit in the field of road safety. It should however be acknowledged that there are uncertainties about the increase of the compliance rate and the expected resulting benefits, as fierce competition on the European transport market may contribute to persistent non-compliance.

5.3.3. *Impact on crime and security*

As indicated in section 2 above, statistically one out of twenty professional drivers is estimated not to comply with social legislation. This situation gives a general impression of impunity which is further exacerbated by the fact that many sanctions foreseen by national legislations are too low in the light of the gravity of the concerned infringements and the social costs they induce

Better enforcement of social legislation in road transport is key for addressing these issues. PP3 and PP4, which lead to sanctions that are more in line with the spirit of Directive 2009/5/EC which provides for the classification of infringements, have a

¹³⁷ Deloitte Study (December 2010) to support an Impact Assessment on Further action at European level regarding Directive 2003/88/EC and the evolution of working time organisation.

¹³⁸ Ibid.

certain potential to correct the misleading signals on the social cost of infringements and reduce the impression of impunity.

5.3.4. *Impact on fundamental rights*

PP2, PP3 and PP4 contain policy measures aimed at reducing the number of drivers in breach of social legislation and at integrating the tachograph with other ITS devices. In theory, these policy measures could affect the following fundamental rights: private and family life (Art. 7), the right to protection of personal data (Art. 8) and the freedom to conduct a business (Art. 16).

As regards the first two fundamental rights, as indicated in section 3 above, policy measures have been designed to comply with the relevant fundamental rights and principles as embodied in the Charter of Fundamental Rights of the European Union. More precisely, the pre-screening of policy measures presented in section 4 above has eliminated the policy measures likely to breach the Charter of Fundamental Rights.

Concerning the automated recording of location data, it should be noted that currently drivers using an analogue tachograph are required to record the place where they start and end their daily working period. As for the needs of control, having an indication of these two points (and not of the exact itinerary taken by the driver) already provide very useful information to check the plausibility of driving patterns observed from the other tachograph data. The data recorded automatically by the tachograph could therefore be limited to these two locations, which would also further reduce the risk of unreasonable interference with the right on the protection of personal data. Finally, it will be clarified that these data may only be used for control purposes.

As regards the possible use of the tachograph data by ITS applications, it should be noted that these applications are not legally required by the legislation. The use of the data by ITS applications would be made conditional on the the informed consent of the driver.

The measure forbidding transport firms from running workshops or vice-versa (PP3 and PP4) can be seen as restricting their freedom to conduct a business (Art. 16). The limitation of this fundamental right induced by this policy measure is however restricted in scope and is seen as being one of the essential elements to reach the objective of improving of improving the compliance with social legislation.

5.4. **Environmental impacts**

Environmental impact of the various policy packages is limited to their effect on modal choices of users. Theoretically, it can be assumed that failure to comply with social legislation leads to artificially low prices for road transport, which could increase the reliance on road transport in cases where it is not the most sustainable modal choice.

Therefore, improved compliance with social legislation would prevent road transport from being artificially cheap and would induce more sustainable modal choices more.

5.5. Impact in third countries

Since June 2010, the digital tachograph has been mandatory for new vehicles used in international transport also by the non-EU contracting parties of the AETR, which accounts for another 22 countries outside the EU in Europe and in the Commonwealth of Independent States. Most of the economic impacts identified above will also apply to those AETR countries once the legislation is transposed into their legal systems.

6. COMPARING THE PACKAGES

Given the scarcity of available data and the difficulty of quantifying and monetizing precisely the costs and benefits of certain policy measures, a full cost-benefit could not be performed. However, a tentative partial cost-benefit is provided in the table in the end of this section, which presents a summary of overview of all positive and negative economic, social and environmental impacts identified in part 5 above for the four policy packages. The impacts are estimated against the baseline scenario.

This section provides for an assessment of how each policy options will contribute to the realization of the policy objectives, as set in Section 3, in light of the following evaluation criteria:

- **effectiveness** – the extent to which options achieve the objectives of the proposal;
- **efficiency** – the extent to which objectives can be achieved at least cost;
- **coherence** – the extent to which policy options are likely to limit trade-offs across the economic, social, and environmental domain.

6.1. Effectiveness

The following table gives a synthetic overview of the policy options' effectiveness with regard to the specific policy objectives defined in section 3, based on the assessment of impacts provided above.

Table 8: Effectiveness of envisaged policy packages in relation to the objectives

<i>Objectives</i>	<i>PP0</i>	<i>PP1</i>	<i>PP2</i>	<i>PP3</i>	<i>PP4</i>
<i>Improve the trustworthiness of the recording equipment</i>	0	Medium	Medium	High	High
<i>Increase the efficiency of the checks of the social legislation in road transport</i>	0	Low	Medium	Medium	High
<i>Reduce the cost related to the use of the recording equipment, notably by reducing the administrative burden related to its use</i>	0	0	Medium (by €383.5 million)	Low (by €142 million)	High (by €515.5 million)

6.2. Efficiency

Overall, most of the measures contained in the four policy packages do not require high investments from public authorities or private entities to achieve the objectives.

- PP1 will only have a **minor cost** implication for the European Committee for Standardisation (CEN).
- PP2 contains two additional measures implying costs:
 - "Wireless communication": will require all the vehicles concerned by the obligation to install and use a tachograph (around 6 million) to buy additional equipment, the cost of which is estimated by manufacturers at €5-10 per tachograph. This will be an additional cost for road transport undertakings. However this additional cost is more than compensated by the benefits for the same undertakings in terms of administrative costs savings. The total balance is therefore positive for the undertaking. There are however other costs to be born by the enforcement authorities in order for the measure to be fully effective. Enforcement officers (around 30 000) will indeed need to buy compatible equipment the cost of which is estimated at a maximum of €7.5 million.
 - "Improved tachograph functions (automatic and manual recording)" will require upgrading the tachograph with a functionality whose cost is estimated by the industry to €5-10 per tachograph. Similarly as above, the additional corresponding costs for the undertakings have already been deducted in the calculation of administrative burden (see Annex III).

The total additional cost required by PP2 are therefore only costs for enforcement authorities and amounts to **€7.5 million**. There are overall no costs for undertakings since the balance is positive for them (i.e. compliance costs are more than compensated by administrative cost savings)

- PP3 will imply costs for administration related to:
 - the mandatory participation of Member States to the TACHOnet system. This concerns only 2 Member States and could not be estimated on the basis of available data.
 - the enhanced training of enforcement officers. The cost might be around €30 million if Member States follow the guidelines provided by the Commission.
 - enhanced rules on the auditing workshops will increase their costs by an estimated €9 million.

The effect of higher fines is neutral, since it will lead to a transfer from private to public entities.

The total cost required by the full deployment of PP3 can therefore be grossly estimated at **over €39 million**, to be born by enforcement authorities. Again as for PP2, there are also costs for road transport undertakings (as the additional cost for workshop will be ultimately passed to road transport undertakings), however these costs are more than compensated by benefits in terms of administrative savings.

- On the basis of the above, the cost of full deployment of PP4 can therefore be estimated at least at **€46.5 million** for enforcement authorities, other costs born by road transport undertakings being more than offset by the benefits in terms of administrative cost savings.

6.3. Coherence

As shown in the table at the end of this section, the analysis seems to indicate that **PP1 presents very limited/no trade-offs** between the different economic, social and environmental impacts.

In PP2, PP3 and PP4, there are important trade-offs between the budgetary impacts on public authorities and other important economic and social impacts. Indeed, as large flexibility is left to the Member States in the use of proposed tools, the effectiveness of the three options depend on the willingness of Member States to invest in order to exploit their full potential. **The trade-offs are highest for PP4.**

6.4. Conclusion

The following table sums up the expected costs and benefits of the different policy packages.

Table 9: Quantifiable costs and benefits of the individual policy packages

	<i>Measures</i>	<i>Benefits</i>	<i>Costs</i>
PP1	Increased reliability of the tachograph	Minor	Minor
PP2	Increased reliability of the tachograph + More effective roadside inspections (more effective inspection tools) + Reduction of administrative burden	€383.5 million	€7.5 million
PP3	Increased reliability of the tachograph + Increased reliability of the driver cards + More effective control in workshops + More effective roadside inspections (better trained officers) + Higher disincentives to cheat (sanctions) + Reduction of administrative burden	€142 million	€9 million
PP4	Increased reliability of the tachograph + Much more effective roadside inspections: inspection tools and training + Increased reliability of the driver cards + More effective control in workshops + Higher disincentives to cheat (sanctions) + Reduction of administrative burden	€15.5 million	€46.5 million

As the other benefits (such as reduction of road accidents or improved working conditions) could not be quantified, table 9 only includes the reduction of administrative burden for the undertakings. It should be noted that these

savings indicated are figures after deduction of the cost of compliance (e.g. the additional cost of 10 -20 €per tachograph)

From an effectiveness point of view, **policy package 4** seems by far most attractive. Indeed, it offers the highest potential level of achievement of the three specific goals, including both immediate and delayed in time effects.

However, as shown by the analysis of coherence between the different policy packages, PP4 also presents the highest trade-offs between the positive economic and social impacts on the one hand side, and the budgetary impacts on public authorities on the other. In terms of coherence, **policy package 1** ranks highest.

Finally, policy package 4 is also the most expensive in terms of investment needed, while **PP1** is the cheapest and the easiest to implement, since it can be adopted without going through the normal legislative procedure. PP3 presents a medium level of achievement of objectives at a low cost.

Table 10: Comparison of Policy Options

	<i>Weighted effectiveness</i>	<i>Efficiency</i>	<i>Coherence</i>
PP0	-	-	-
PP1	Fairly low	No cost	High
PP2	Medium	€7.5 million	Trade-offs
PP3	Medium	€39 million	Trade-offs
PP4	High	€46.5 million	Highest trade-offs

Taking all these aspects into consideration, and despite the impossibility to present the results of a full cost-benefit analysis, the positive impacts of PP4 seem to compensate by far its costs. Indeed, the administrative burden reduction potential of PP4 alone reaches €15.5 million and is well above the total costs of its full implementation which amount to €46.5 million.

In view of the above, it can be said that the performed analysis suggest that Policy package 4 should be the preferred option.

Table 11: Summary table of impacts

Impacts

	<i>Policy package 1</i>	<i>Policy Package 2</i>	<i>Policy Package 3</i>	<i>Policy Package 4</i>
<i>Compliance with social legislation</i>	Small and delayed improvement limited to the fraud on the tachograph (1/4 of all offences to social legislation)	Impact of PP1 + large potential improvement Big uncertainty on the scale of results (trade-offs with budget implications)	Impact of PP1 + large potential improvement Big uncertainty on the scale of results (trade-offs with budget implications)	Impact of PP1 + large potential improvement Smaller uncertainty of results than for PP2 and PP3 (large trade-offs with budget implications)
<i>Economic impacts</i>		Same assessment as for compliance with social legislation		
Functioning of the Internal Market and competition	Small and delayed improvement limited to the fraud on the tachograph (1/4 of all offences to social legislation)			
Competitiveness	Positive for tachograph manufacturers	Very positive for tachograph manufacturers	Positive for tachograph manufacturers Uncertain for workshops Positive for undertakings for which transport is not the principal activity	Very positive for tachograph manufacturers Uncertain for workshops Positive for undertakings for which transport is not the principal activity
Administrative burden and SMEs	Negligible	- €83.5 million	- €142 million	- €15.5 million
Budgetary impacts on public authorities	Minor negative at EU level	Impact of PP1 + Potentially negative (up to € 7 500 000) at national level but depending on the choices of MS (trade-offs	Minor negative at EU level Small positive effect of sanctions	Impact of PP1 + potentially largest negative at national level but depending on the choices of MS (trade-offs with other

	with other impacts)	impacts)
<i>Social impacts</i>		Small positive effect of sanctions
Working conditions, health and lifestyle of drivers	Positive but delayed through increased user friendliness of the device	Same assessment as for compliance with social legislation
Road safety	Positive but delayed through easier access while driving	Same assessment as for compliance with social legislation
Crime and security	Minor impact	Small positive impact thanks to more appropriate fines
Fundamental rights	No impact	Marginal negative impact for on the freedom to conduct a business
<i>Environmental impacts</i>	Marginal positive	
<i>Impact on specific regions</i>	Larger impact of all measures for undertakings from MS with high wages (EU-15).	
	Larger impact for Member States with a large transport sector or high share of transport undertakings in the economy (Germany, Poland, Spain, Netherlands, Romania, Lithuania, Czech Republic)	Larger effects of more appropriate sanctions in Member States with low severity of sanction today
<i>Third countries</i>	Delayed but similar impacts on AETR countries.	

7. MONITORING AND EVALUATION

Regular evaluation of the tachograph regulation seems important in order to assess the effectiveness and efficiency of the system put in place.

The level of attainment of the operational objectives will be monitored in the year the proposed legislation enters into force and regularly afterwards; the achievement of the last objective will be monitored through consultation of stakeholders following the definition and putting in place of interoperability standards.

Table 12: Monitoring

Operational objectives	Monitoring
Eliminate the "most serious infringements" against tachograph rules by 2020	The monitoring will be performed by using information that Member States have to communicate every two years to the Commission pursuant to Article 17 of Regulation (EC) No 561/2006
Double by 2020 the detection rate of infringements to the social legislation per vehicle controlled in a roadside check compared to 2008	The monitoring will be performed by using information that Member States have to communicate every two years to the Commission pursuant to Article 17 of Regulation (EC) No 561/2006
Reduce the administrative burden related to the use of the digital tachograph by 20 % before 2020 compared to 2010	Use of technical upgrades of tachograph equipment will be monitored through discussions with interested parties and based on the estimations provided by the Stoiber Group and the EU project on baseline measurements and reduction of administrative costs

For the purpose of this monitoring, more detailed information and statistics are necessary. The Commission intends therefore to adapt the reporting format for the bi-annual reports foreseen in Art. 17 of Regulation (EC) No 561/2006¹³⁹ in order to have better categorised data which will help monitoring and support future decision making.

The evaluation and monitoring by the Commission will be possible at least every two years, after reception of the statistical data from Member States.

¹³⁹ Commission Decision of 22.IX.2008, C(2008)5123

General presentation of the digital tachograph***1. The introduction of the digital tachograph***

The technical specifications for the tachograph laid down in the Annexes to Council Regulation (EEC) No 3821/85 have been adapted to technical progress ten times. The most important change was the introduction of the digital tachograph, which has been mandatory for all new vehicles since 2006, replacing the paper-based analogue tachograph. The old analogue tachograph was easy to tamper with and was not able to give reliable enough data to check that drivers and companies complied with the social legislation. The digital tachograph offers a more reliable way of monitoring compliance because it is more difficult to manipulate, and attempts to do so can generally be more easily detected.

The latest update of the digital tachograph specifications was adopted in 2009. It improved the human machine interface and solved the ‘one minute issue’: a minute is no longer automatically considered driving time if driving activity only lasted a few seconds during that minute. Further provisions aimed at improving protection against fraud enter into force in 2012. The introduction of a second source of motion detection will reduce scope for manipulating the tachograph. In addition, the tachograph’s motion sensor will be better protected against malicious attacks using magnets or other devices to manipulate it. To ensure that each driver uses only one driver card, which is used to record the driver’s activities, one of the new provisions requires Member States to share information electronically. To this end, the Commission has adopted a Recommendation to Member States to use electronic exchange systems – mainly the ‘TACHOnet system’ – to check the cards.

There is a developing global market in tachograph components as tachographs are used or introduced in many parts of the world and cross-border trade in these components occurs. Since June 2010, the digital tachograph has been mandatory for new vehicles used in international transport by the non-EU contracting parties of the AETR, which accounts for another 22 countries outside the EU in Europe and in the Commonwealth of Independent States. The EU can be considered a world leader in tachograph manufacturing but there is a need to keep the product attractive, both within the EU and beyond, and to ensure that this remains the case.

2. Main actors

Introducing the digital tachograph system involved the following groups of stakeholders:

- End users: drivers and road transport companies (using driver cards and company cards).
- Enforcers (using control cards), which, depending on the Member State, may include the police and the Ministries of Transport or Labour.
- Companies manufacturing the vehicle unit, the motion sensor, the cards, card reading tools, calibration tools, downloading tools, data analysis tools and equipment that interfaces with the tachograph.
- Type-approval bodies.

- Security management authorities.
- Card-issuing authorities.
- Workshops and fitters (using workshop cards).
- Vehicle manufacturers.

3. How the digital tachograph works

The following parts of the digital tachograph are installed in the vehicle (see Figure 1):

- The vehicle unit, which records, stores, displays and prints data on driver activities. It receives data on the vehicle’s motion from the motion sensor. It is normally fitted in the vehicle cabin, so that drivers can access it. There are four manufacturers of type-approved vehicle units.
- The motion sensor, which detects the motion of the vehicle and sends this information to the vehicle unit. The motion sensor shares a mechanical interface with some moving part of the vehicle (it is traditionally screwed into the vehicle’s gearbox), the movement of which is representative of the movement of the vehicle as a whole and allows the inference of speed or distance. There are currently only two manufacturers of type-approved motion sensors.
- A four-wire cable, which connects the vehicle unit to the motion sensor. It allows data to be exchanged between the motion sensor and vehicle unit and delivers power to the motion sensor.

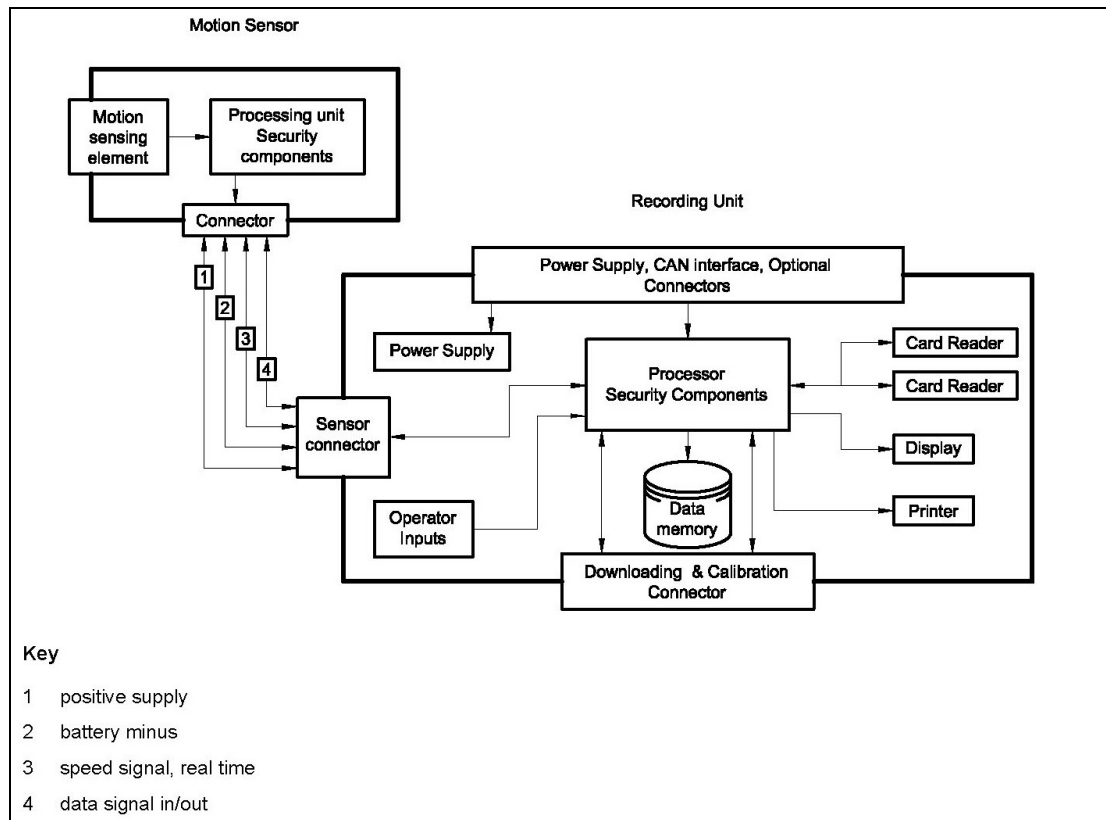


Figure 1: Schemata of typical digital recording equipment

In addition, smart cards used by drivers, transport companies, workshops and enforcement officers are crucial to the digital tachograph system. There are four kinds of tachograph cards:

- Driver cards contain microchips that can store all the data required for checking compliance with Regulation (EC) No 561/2006 on driving time. They store at least 28 days' data and are valid for five years. Each driver may be issued with only one driver card, which is unique to him or her. A driver must use the card for the whole of his or her daily working period. The card must be presented to an enforcer on request. Companies must periodically download data to maintain complete records of their drivers' activities.
- Company cards are valid for five years and they are used by companies to download data from the digital tachograph unit in order to monitor drivers' activities. In addition, they are used to generate records at the company's premises for inspection by enforcement officers. They also allow companies to lock data in the tachograph to prevent downloading by others.
- Workshop cards are made available by the card-issuing authorities to approved workshops to allow them to fit and to calibrate the digital tachographs. Workshop cards are valid for one year.
- Control cards are only available to enforcement officers. They allow them to access the mass memory of digital tachographs and driver cards, and to print out relevant information.

The use of tachographs involves collecting and processing personal data. This data capture and processing is subject to personal data protection rights under Article 8 of the Charter of Fundamental Rights of the European Union, Article 8 of the European Convention of Human Rights, and Article 16 of the Treaty on the Functioning of the European Union. Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data also applies.

The EU tachograph market is currently served by only two motion sensor manufacturers and four vehicle unit manufacturers, so competition is limited. It is conceivable that at some point in the future only one manufacturer will produce a motion sensor as defined in the latest adaptation of the technical specifications, and will therefore have a monopoly. There is no clear evidence that this would lead to a problem, because the market remains open to competitors. In theory, however, competitive markets tend not to be so highly concentrated and the gains of competition – lower prices, higher quality – are lost when markets lack competition.

4. Evaluation of the introduction of the digital tachograph

Generally, the introduction of the digital tachograph can be considered a success, certainly bearing in mind the large variety of stakeholders involved in the system.

The digital tachograph allows better enforcement of the social legislation, as it is much harder to commit and conceal fraudulent manipulation of the tachograph. Quantitative evidence of digital tachographs reducing fraud is limited. However, it is widely thought by police,

enforcement authorities and road transport firms that digital tachographs reduce fraud.¹⁴⁰ New vehicles are now required to be fitted with a digital tachograph, although older vehicles, still equipped with analogue tachographs, continue to be used. The introduction of the digital tachograph has therefore contributed to achieving the aims of the social legislation (improved road safety, better working conditions for drivers, and fair competition between transport companies).

The digital tachograph also helped reduce administrative costs for road transport firms. An analysis carried out by the Enterprise DG¹⁴¹ supported this claim as follows:

- The use of analogue tachographs involved many manual operations, availability of paper records and a high frequency of tampering (when compared with digital tachographs). The introduction of digital tachographs was estimated to have reduced administrative costs by €286 million a year, or roughly 10 percent of annual administrative costs.
- The latest adaptation of the digital tachograph (see 2.1.2.) addressed two other issues: manual inputs concerning time not spent driving, and rounding up to the next minute. It is estimated that the new measures account for a reduction of €234.5 million a year, or roughly 8 percent of annual administrative costs.

According to a study commissioned by the UK Department for Transport, the savings are primarily in the costs of third party analysis of data and in management staff. There are one-off costs related to training drivers. There are also non-measurable benefits from greater security and the freeing of office space previously used to store charts. The extent of the savings depends on several factors, including the type of operation (fleet or passenger) and the size of the fleet (with larger fleet sizes associated with higher savings).

Finally, the digital tachograph is also an innovative product and as such a technological success. The EU is a global leader in this field and other countries are showing a growing interest in introducing this European technology to their own domestic road transport markets (for example Russia, Morocco and Argentina).

In conclusion, although the introduction of the digital tachograph faced many technological and administrative challenges, it was ultimately successful. A new market for specific services has developed. The device has helped to simplify enforcement of social legislation and to reduce administrative costs.

¹⁴⁰ JRC, Report on the vulnerability and controllability of the digital tachograph, 2010

¹⁴¹ Communication from the Commission to the Council and the European Parliament, Action Programme for Reducing Administrative Burdens in the EU, Sectoral Reduction Plans and 2009 Actions, COM(2009) 544 final

Economic approach to non-compliance with legislation

Rules should be conceived in a way which makes the expected return on non-compliance with Regulation (EEC) No 3281/85 (or successor Regulations) less than the expected return on compliance. This conclusion follows from the work of economist Gary Becker.

In a seminal article, Becker (1968)¹⁴² presented the first formal economic theory of crime. In his model, Becker considers an offender's choice about whether to commit a crime. The offender has a certain probability of being caught and convicted. If caught, offenders face punishment. They choose to commit crime if the expected utility is positive. The probability of being caught is a subjective probability: offenders may differ in the way they assess risks. Some may underestimate the odds of being caught while others may overestimate them.

The expected utility of deliberate attempts to circumvent social legislation is the following:

$E(u) = (1-p)u - pP - c$, where

u = Benefit of non-compliance

p = Probability on a scale from zero (no possibility) to one (certainty) of non-compliance being detected

c = Costs associated with non-compliance, irrespective of whether non-compliance is detected or not, e.g. cost of buying a device to manipulate a tachograph

P = Disutility of being caught, e.g. fine.

This suggests that policy should seek to minimise deliberate attempts to circumvent social legislation through:

- (1) **Increasing the costs of circumventing social legislation:** If tachographs can be tampered with at low cost, this increases the risk of attempts to circumvent social legislation. Regulation should seek to increase the costs of tampering with tachographs by prohibiting, as far as possible, the known means of tampering with them.
- (2) **Reducing the benefits of circumventing social legislation:** Policy can do little to affect the competitive advantage which road transport companies or drivers perceive themselves to be gaining when circumventing social legislation.
- (3) **Increasing the disutility of being caught:** Policy may seek to reduce the expected benefits of doing so by increasing the fines and/or other penalties that can be levied for breaches of Regulation (EEC) No 3281/85. It is at this point that the necessity of harmonised sanctions becomes crucial.
- (4) **Increasing the probability of fraudulent operators being caught:** This could be achieved through increasing the efficiency of checks, i.e. the proportion of roadside checks in which non-compliance is detected.

¹⁴² Gary Becker (1968). 'Crime and Punishment: An Economic Approach'. The Journal of Political Economy 76: pp. 169–217.

Administrative burden and Standard Cost Model

Most of the measures recommended will have no or only a marginal influence on the administrative burden. Measures with a bigger impact are described in more detail here. To simplify matters, the calculations were made with a time horizon of after 2020 when the whole fleet, i.e. 6 million vehicles, will be equipped with digital tachographs.

(1) Auditing workshops

There are currently around 9000 workshops approved by Member States. In Sweden, the costs of an audit are put at €2200. Based on this rather high figure, complete yearly auditing of all workshops in the EU would cost business some **€20 million**. However, the total amount does not take into account that in some Member States, workshops are already audited on a regular basis.

(2) Merging driver cards with the driving licence

The calculation is based on the following assumptions. If all vehicles are equipped with digital tachographs, all drivers will have to apply and pay for a driver card every five years. It is assumed that the total time that a driver spends on the application procedure (filling in the form, supply a picture, getting the card, etc.) is two hours. The weighted hourly rate for a driver in the EU is €15.50¹⁴³ and the weighted average price for a driver card is €53. Even if the price for the driving licence would increase due to the addition of driver card's functionalities, there would be an overall reduction of costs for drivers. This measure would thus lead to a **reduction** in the administrative burden of **€100 million**. This amount does not include the extra savings by Member States, which would no longer have to run two separate systems for issuing driving licences and driver cards, as these savings could vary greatly from one country to another.

(3) Requiring automated recording of the vehicle's precise location through GNSS

The calculation is based on the following assumptions. All drivers are obliged to record the place/country where they start and end the daily working period; this is assumed to take 6 million drivers one minute, 230 days a year. The weighted hourly rate for a driver in the EU is €15.50. The additional manufacturing costs of building a GNSS receiver into the equipment are estimated by manufacturers at €5-10. The economic lifetime of a vehicle is around eight years¹⁴⁴. The total **reduction** in administrative burden resulting from this measure would therefore be some **€349 million**.

(4) Using wireless communication to 'filter' roadside checks

The calculation is based on the following assumptions. It is estimated that one third of the 4.5 million roadside checks of vehicles every year involve compliant businesses and could be avoided. Assuming that checks last 45 minutes, filtering out compliant businesses would

¹⁴³ Hourly wages based on standardised Eurostat data (the four-yearly Labour Cost Survey and the annual updates of labour cost (ALC) statistics) used by the Commission for large scale measurement of administrative burdens (2008-2009).

¹⁴⁴ NEA, *Cost comparison and cost developments in the European road haulage sector*, 2009.

reduce the administrative burden on them by **€17 million**. Assuming that the average weighted hourly rate for an enforcement officer is €23.05, avoiding unnecessary inspections would **save** another **€25 million**. The equipment costs of around €10 per vehicle would apply to all 6 million vehicles. Given the economic lifetime of a vehicle, the equipment **costs** per year are some **€7.5 million**.

(5) Scope of the regulation

The tachograph is the mandatory monitoring equipment covered by Regulation (EC) No 561/2006. Article 13 of Regulation (EC) No 561/2006 allows Member States to exempt certain categories of drivers or types of transport operations from the driving hours rules and hence from the obligation to install and use a tachograph when certain conditions are met, provided the objectives of the Regulation (EC) No 561/2006 are not affected. Five out of 16 possible exemptions are distance based, with distances varying between 50 and 100 km.

In particular, Article 13(1)(d) of Regulation (EC) No 561/2006 provides the possibility to grant exemptions "to carriage by vehicles or combinations of vehicles with a maximum permissible mass not exceeding 7.5 tonnes used for carrying materials, equipment or machinery for the driver's use in the course of his work. These vehicles shall be used only within a 50 kilometre radius from the base of the undertaking, and on condition that driving the vehicles does not constitute the driver's main activity."

Under the Commission's Action Programme for Reducing Administrative Burdens in the European Union, the Stoiber group proposed to extend the radius of this possible exemption from 50 km to 150 km.

This option would thus mean a change to Regulation (EC) No 561/2006 in order to allow Member States to exempt vehicles carrying materials, equipment or machinery for the driver's use in the course of his work within a radius of 150 km instead of 50 km. The impacts of such a measure on the aims of Regulation (EC) No 561/2006 also have to be evaluated by Member States when granting such exemptions, as required by Article 13, in order to prevent any prejudice against the objective of the Regulation. The Stoiber group evaluated the possible reduction of administrative burden at €82 million. This was based on an assumption that 5% of the businesses using a digital tachograph are small and medium sized trade and craft businesses, and that 55% use their vehicles within a radius of more than 50 km. In the meantime, the Zentralverband des Deutschen Handwerks (ZDH) estimated that 35% of these firms are active in a radius between 50 and 150 km. Therefore, the expected reduction in administrative burden would amount to **€52 million**.

A variant would remove the discrimination between the different exemptions which currently use limits of 50 km or 100 km. This option would help to simplify the Regulation and thereby make the exemptions easier to enforce. Compared to an extension to 150 km, some firms operating in a radius between 100 km and 150 km might not benefit from the exemption. However, the reduction of administrative burden as a result of this measure should be close to that of the first variant or be even greater, as other categories of drivers, who are currently limited by a 50 km exemption, would benefit from this doubling of the permitted distance.

Standard Cost Calculation for costs related to road transport undertakings (excluding workshops)

Type of obligation	Description of required action(s)	Measure taken	Rate (€ per hour)	Time (minutes)	Price (per action)	Freq (per year)	No of entities	Total number of actions	Equipment costs (per entity & per year)	Outsourcing costs (per entity & per year)	Total Administrative Costs
Application for individual authorisation or exemption	Filing forms and tables	Driver card	16	-120	-31	0,2	6.000.000	1.200.000	-11		-100.800.000
Cooperation with audits and inspection by public authorities, including maintenance of appropriate records	Producing new data	GNSS for automated recording of location	16	-1	-0,26	230	6.000.000	1.380.000.00 0	1,25		-349.000.000
Inspection on behalf of public authorities	Inspecting and checking (including assistance to inspection by public authorities)	Filtering roadside checks - companies	16	-45	-12	1	1.500.000	1.500.000			-17.437.500
Inspection on behalf of public authorities	Inspecting and checking (including assisting inspection by public authorities)	Filtering roadside checks - enforcement officers	23	-45	-17	1	1.500.000	1.500.000			-25.931.250
Inspection on behalf of public authorities	Inspecting and checking (including assisting inspection by public authorities)	Scope of the use of tachographs	16	-7	-2	230	105.000	24.150.000	-87		-52.806.250

Review of the tachograph and ITS

Intelligent Transport Systems (ITS), which are broadly defined as systems using ICT in transport, would benefit from the introduction of an open in-vehicle platform architecture, which would allow various applications to securely share common information and resources and, where useful, to interact in an integrated manner.¹⁴⁵ There would be mutual benefits in having a digital tachograph design compatible with such an open in-vehicle platform architecture. Indeed, the tachograph is mandatory equipment in most commercial vehicles, which becomes more and more integrated into vehicles at ‘first mount’ because the data/signals recorded by the tachograph, their reliability and their security are also necessary for other in-vehicle applications (e.g. automatic gear shifting). An open in-vehicle platform architecture would also reduce design, manufacturing, installation and operational costs for equipment manufacturer and transport firms, as the relevant functionalities could be provided to a vehicle at relatively little cost by benefiting from resources shared with other instruments and applications. This would also enhance global security, as data from a variety of sources (i.e. more than the two sources already foreseen by Regulation 1266/2009/EC) of information would be available for the implementation of the social legislation, which can be cross-checked for consistency. Finally, the development of these next generation digital tachographs may enhance competition because they will foster the appearance of new products, applications and services which will develop new markets. New manufacturers could be attracted into established markets and introduce new products. It can also be noted that the recently published final report of a study commissioned by the Commission on the development of an open in-vehicle platform architecture in the context of the ITS action plan recommends making use of the opportunity provided by the revision of the tachograph specification to define the digital tachograph as the core telematics element in a (heavy) vehicle and an essential part of the open in-vehicle platform architecture.

¹⁴⁵ See Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport, OJ L 207, 6.8.2010, p. 1–13

Calculation of the cost of fatigue for HDV

Cost of HDV accidents in the EU27 in 2010 (EUR of 2000)	10.039.273.900
HICP growth between 2010 and 2000	26,52%
Cost of HDV accidents in the EU27 in 2010 (EUR of 2010)	12.702.036.655
Fatigue as the most important cause of HDV accidents (as % of all accidents) ¹⁴⁶	6%
Fatigue as one of the main causes and aggravating factor of HDV accidents (as % of all accidents) ¹⁴⁷	40%
Estimated cost of fatigue (as cause of HDV accidents) in 2010 (EUR of 2010)	
minimum	762.122.199
maximum	5.080.814.662
conservative estimate	2.201.686.354

¹⁴⁶ IRU, European Truck Accident Causation Study, 2006

¹⁴⁷ National Transportation Safety Board, Factors That Affect Fatigue in Heavy Truck Accidents – Safety Study, 1995

Types of possible attacks to the tachograph

A recent report of the Commission's Joint Research Centre (JRC)¹⁴⁸ analysed the various categories of threats:

- Installation of "exotic devices" inserted in the cable between the motion sensor and the activity recorder (the so-called Vehicle Unit). The speed signal that is issued by the motion sensor is processed by the exotic device to generate an amended signal. Depending on the type of the exotic device (two major types exist), this manipulation allows to record a speed signal inferior to the speed of the vehicle or no speed signal at all.
- Direct manipulation of the electronic circuit of the motion sensor which allows modifying the speed signal sent by the motion sensor.
- Placing of a strong magnetic field nearby the motion sensor installed on the gearbox which results in the motion sensor failing to detect the motion of the vehicle.

¹⁴⁸ JRC, Report on the attacks to security of the Digital Tachograph and on the risk associated with the introduction of adaptors to be fitted into light vehicles, 2007.

Pre-screening of possible measures addressing the different problematic areas

The following measures were proposed in the stakeholder consultation or elsewhere but were discarded at an early stage of the impact assessment as too difficult to realise or not bringing sufficiently high benefits in comparison to their costs:

1. Provide remote data communication functionalities for the digital tachograph

These remote download functionalities may reduce costs for road transport companies that are obliged to regularly download data from the driver cards and tachographs. However, these functionalities are already available on the market and fully compatible with the present Regulation. They can thus be provided without policy changes. In order to keep EU intervention to the necessary minimum, there appears to be no need for action at this level.

2. Reduce data tariffs for remotely downloading data from digital tachographs

Some stakeholder consultation respondents pointed out that the high cost of data transfer tariffs (especially roaming charges) make the adoption of wireless technology for data downloading costly. Reducing these costs would incentivise the uptake of wireless technology, and make remote control an attractive option. This might reduce the administrative burden and increase the efficiency of inspections. However, the reduction of data transfer tariffs is likely to require changes to telecommunications rules, e.g. on roaming, which are beyond the scope of this impact assessment (which is concerned only with control of social rules in road transport Regulation (EEC) No 3821/85).

3. Increase the speed of downloading from the digital tachograph

Some respondents in the stakeholder consultation asked for faster downloading of data from the digital tachograph. However, market pressure has already led tachograph manufacturers to produce equipment with a significantly higher download speed than the first digital tachographs in 2006. Today, wireless download tools are already available which solve the problem of downloading time. Moreover a legally binding downloading speed would require the EU to establish who is responsible for what (e.g. card issuing authorities, tachograph manufacturers, manufacturers of downloading equipment) and not all are subject to type approval. In addition, according to the manufacturers, the bottleneck for improving download speed is not the type of connector. Replacing the current connector by (for instance) a USB connector would therefore not lead to significant time savings. Finally, Commission Regulation (EU) No 581/2010 on the maximum periods for the downloading of relevant data from vehicle units and from driver cards¹⁴⁹ has clarified that certain data do not need to be downloaded, thereby also reducing the downloading time. It can therefore be considered that the slow downloading speed has been a transitory problem which does not require further action.

¹⁴⁹ OJ L 168, 2.7.2010, p. 6

4. *Retrofitting of all vehicles with digital tachographs*

It could be considered that replacing the more unreliable analogue tachograph which is still in use in vehicles registered before 2006 by the digital tachograph would contribute to achieve a more trustworthy collection of data. However, at the time of introduction of the digital tachograph, the decision not to replace the existing analogue tachograph has already been taken, the main reason therefore being the technical difficulties or impossibilities to fit the digital tachograph in these old vehicles. Consequently, stakeholders have not considered such a measure which would have a drastic cost impact.

5. *Automatic recording of the vehicle's weight*

Some stakeholders suggested that weight could provide an additional measure of time worked by the driver. This time would include undertaking tasks other than driving. In particular, some drivers spend time at work loading and unloading their vehicle. Recorded variations in weight, it is argued, would enable the tachograph to record such loading and unloading activity as time worked by the driver. However, this argument does not take into account the possibility that the driver may be resting while other workers load and unload the vehicle. Consequently, while recording weight might be technically feasible and might enable the tachograph to be useful in enforcing the regulations on the weight and dimensions of vehicles¹⁵⁰, it is irrelevant to the problems identified in this IA. Any benefit in respect of enforcing the rules on maximum weight through automated recording of the weight should be subject to a proper impact assessment.

6. *Draw up EU type-approval procedures for seals*

The establishment of requirements on seals in the regulation would lead to difficulties in keeping up with technical progress. It may also be that, in future, secure digital tachographs which do not require seals will be developed. This future development is likely to be undermined by a requirement that digital tachographs must be fitted with a type-approved seal. The benefits of drawing a type-approval procedure for seals would be comparable to developing standards through European standardisation bodies (which was retained as a viable measure – see part. 4.2), but the costs would seem higher.

7. *Carry out all inspections of tachograph recordings via remote checks*

If this measure was adopted, the full set of data recorded by the tachograph would be downloaded remotely and controlled. This however raises data protection and fundamental right concerns as it would require to make available all information related to the driver. Drivers would no longer have the opportunity to explain to the control officers abnormal recordings which may well not involve an infringement of the social legislation (for example, when exemptions are used) before being sanctioned. This measure would be therefore disproportionate and excessively impacting on fundamental rights.

¹⁵⁰ Council Directive 96/53/EC of 25 July 1996 laying down for certain vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic, OJ L 235, 17.09.1996, p. 59

8. *Require certain ITS applications to be integrated into the tachograph*

In this measure, the design of a standard open in-vehicle platform integrating the tachograph and other, predefined ITS applications would be imposed by the legislation. This solution would be inefficient as users would have to pay for several integrated ITS applications they may not need. Moreover, there would be liability and ownership issues, as legally the different instruments and applications in a vehicle are currently owned by different parties. Lastly, such a measure would also require major preparatory technical work, which would delay the introduction of improvements to the functionalities of digital tachographs. Taking these factors into account, the definition of a standardised open interface between the tachograph and other ITS applications is retained for further analysis as more proportionate while providing similar benefits.

9. *Limit the number of days which can elapse before the card is declared lost, and require that driver cards are issued only to professional drivers*

While this measure might potentially improve compliance, the costs it would impose on drivers and road transport firms are likely to be disproportionate. Reducing the reporting allowance would impose costs on drivers who are at the beginning or in the middle of their journeys. Additionally, in absence of the driver card, drivers have to record their activities manually, thereby reducing the risk of abuse.

The issuance of driver cards to persons who are not professional drivers is seen as a possible source of abuse, as professional drivers could use the cards of these persons in order to avoid compliance with social legislation. However, several firms employ persons who are not professional drivers but who need to be able to move the vehicles (such as maintenance workers), and hence require driver cards.

10. *Reduce the number of days of recordings to be carried by users of analogue tachographs*

The Stoiber Group proposed to reduce the number of records to be carried by the driver from the current 28 days. However, if the number of days were reduced, information concerning compliance with the requirements on weekly rest periods may be lost. In addition, the costs to enforcers would increase, and they would then have to carry out more checks in order to meet the target number of days checked¹⁵¹. Finally, this concerns mostly users of analogue tachographs, as for users of digital tachographs, the driver card should be sufficient in most cases.

11. *Legislate on the access to tachograph data for accident investigation*

The current EU legislation does not prevent access to tachograph data for accident investigation and a revision will not change this situation. It should however be noted that is very difficult to establish a direct link between causes of the accident and possible infringements against the social legislation. Setting up a mandatory dedicated monitoring of accident causes by the public authorities would be disproportionate.

¹⁵¹ Directive 2006/22/EC lays down a minimum level of checks to be carried out by Member States

Recording of location data

With analogue tachographs, drivers have to record the start and end place of their working day. For digital tachographs, this requirement has been replaced by an obligation to record this information at the level of Member States only, making this information practically useless for enforcement purposes. Enforcement officers indicated during the consultation process and within the Expert Panel that the loss of this information on the start and end of journeys has been a detrimental aspect of the switch from analogue to digital tachographs. The loss of this information makes it less likely that the social legislation will be properly enforced and means that roadside checks take longer. It is recommended, therefore, that the regulation should require that the start and end place of working days be recorded.

Vehicle location data could come from GNSS or from GSM/UMTS base stations. Indeed, GSM/UMTS base stations triangulations have an accuracy of 100-1000 Meters, and such a precision fit the purpose. So the use of GSM/UMTS sim cards would deliver appropriate position for journeys start-end. The limitations here are the annual fixed costs of a GSM card fee, topped by the GSM mobile communications every time a position would have to be recorded. So, a simple GNSS receiver is probably more appropriate.

The analysis presented below suggests that the benefits of an automatic approach to the recording of location using GNSS would outweigh those of a manual approach.

	Automatic	Manual
Additional manufacturing cost	€-10 per tachograph	€-10 per tachograph
Impact upon drivers	It would reduce by a few minutes each day the amount of time which drivers spend inputting to their tachographs	It would increase by a few minutes each day the time which drivers spend inputting to their tachographs
Impact upon enforcers	According to ECR, it would reduce the length of the average check by 20 minutes (in the period 2007-2008, 9.5 million checks on drivers were made)	Enforcers can have less expectation of consistent and accurate records if manual entries are made

The analysis of administrative burden in Annex III shows that GNSS can lead to a reduction of €349 million in administrative burden.

Implementation of the recommended policy package

The following steps would be taken in order to implement the recommended policy package.

In a first step, the Commission would submit a proposal to the European Parliament and the Council to revise the Tachograph Regulation. At the same time, the Commission would adopt a Commission Communication explaining (1) the roadmap for the technical implementation of the different measures, (2) the mandate to CEN on seals, (3) the vision for the future cooperation within AETR.

In a second step, delegated and implementing acts would be adopted. As long as the implementing/delegated acts would simply implement the measures as described in the present IA, it seems not a priori necessary to carry out an additional IA (this goes for instance for the wireless communication or the integration of GNSS). If need be, such an IA would of course be carried out for delegated if additional measures not covered by the present IA would be envisaged.

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