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**ROADWORTHINESS PACKAGE**

**COMMISSION STAFF WORKING PAPER**

**IMPACT ASSESSMENT**

***Accompanying document to the***

**REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on periodic roadworthiness tests for motor vehicles and their trailers and repealing Directive 2009/40/EC**
**and**
**REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the technical roadside inspections of the roadworthiness of commercial vehicles circulating in the Union and repealing Directive 2000/30/EC**
**and**
**DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Council Directive 1999/37/EC on the registration documents for vehicles**

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## 1. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

Lead DG: Directorate General for Mobility and Transport

Agenda planning: 2010/MOVE/014

Proposal for a Regulation of the European Parliament and of the Council amending Directive 2009/40/EC of the European Parliament and of the Council of 6 May 2009 on roadworthiness tests for motor vehicles and their trailers.

Proposal for an amendment of Directive 2000/30/EC of the European Parliament and of the Council of 6 June 2000 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Community.

### 1.1. Organisation and timing

The work on this impact assessment (IA) was launched at the beginning of 2010[1]. An Impact Assessment Steering Group (IASG)[2] was set-up on 2 July 2010 and 8 meetings were organised between July 2010 and April 2011.

### 1.2. Consultation and expertise

A public consultation, which met the Commission's minimum standards on public consultation, was launched on 29 July and lasted 8 weeks ending on 24 September 2010. It aimed at collecting the opinion of the broader public about a possible modification of the

[1] Annex 2 summarises the main steps of the process in chronological order.

[2] DGs CLIMA, ENTR, INFSO, OIB, TAXUD and the SG participated in the IASG meetings. The last IASG meeting took place on 27 April 2011 and the final version was circulated on 31 May 2011. Annex 2 summarises the main steps of the process in chronological order.

Periodic Technical Inspection (PTI) systems in Europe and about the ways to tackle the problems identified in the current system. 9,653 responses were received from citizens, Member State authorities, equipment suppliers, test centres, garage associations and vehicle manufacturers.

An expert meeting was held on 31 August 2010, followed by a stakeholder meeting on 8 September 2010. These meetings identified as most important issues related to the current PTI system in Europe the differences in terms of quality and modalities of testing leading to the lack of mutual acceptance of PTI results between Member States, and the lack of data exchange (in particular the fact that important data on vehicle history is not available to PTI stations).[3] It is worth mentioning that Prof. Dr W. Schultz from the University of Cologne, who participated in the stakeholder meeting, presented a model for the cost-benefit analysis in the field of PTI, which has been used for in this IA report for the analysis of impacts of different policy options.

The internet consultation showed relatively strong support for changes in the PTI system, notably in what concerns the inclusion of additional types of vehicle and the enhanced exchange of data between Member States, as well as for the extension of roadside inspections (RSI) to all vehicles. The results of the consultation need to be seen in the light of the fact that it triggered a campaign of the Federation of European Motorcyclists' Associations (FEMA)[4], launched one month after the start of the consultation, which resulted in about 5 000 responses supporting FEMA's position, which is against the inclusion of powered two wheelers (PTW) into periodic inspections.[5]

The IA report is also supported by a study completed on behalf of the European Commission by Europe Economics.[6] This study was mainly related to the calculation of the expected impacts of the different policy options envisaged and is attached to this IA.[7]

Finally, the study used several scientific and evaluation reports, notably as sources of models and data for the estimation and monetization of the costs and benefits of the different policy options. The list of studies most extensively used include:

- The Report from the Commission to the Council and the European Parliament on the application by the Member States of Directive 2000/30/EC of the European Parliament and of the Council of 6 June 2000 on the technical roadside inspections of the roadworthiness of commercial vehicles circulating in the community - Reporting periods 2005–2006 and 2007–2008 (COM(2010) 754 final,

- "MOT Scheme Evidence-base" Department of Transport (UK, 2008),

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3 Annex 3 contains the full list of participants and a more detailed summary of the findings of both meetings.

4 See FEMA position on PTI http://www.fema-online.eu/uploads/documents/vehicle%20aspects/20100903_FEMA_Position_Statement_PTI.pdf, and www.motorcyclenews.com, 22 September 2010.

5 A detailed summary of the results of the consultation is contained in annex 5 and is also available on the Commission website http://ec.europa.eu/transport/road_safety/take-part/public-consultations/pti_en.htm.

6 Europe Economics, final report, February 2011, *Report of contribution to impact assessment of policy options to improve the EU system of PTI and of roadside vehicle testing*, attached as annex 14.

7 Ibid.

- DEKRA Road Safety Report 2008 – Strategies for preventing accidents on Europe's roads,
- DEKRA Road Safety Report on Trucks 2009,
- DEKRA Motorcycle road safety report 2010,
- TÜV Reports 2009 / 2010.

### 1.3. Results of the consultation of the Impact Assessment Board

The draft report for this impact assessment was submitted to the Impact Assessment Board (IAB) on 8 June 2011. In its opinion of 11 July 2011, the IAB made a number of recommendations which were taken into account in the final draft. The most important amendments in comparison to the version submitted on 8 June are the following:

- More evidence has been provided on the link between higher roadworthiness requirements and improvement of road safety: a table indicating the correlation between the occurrence of fatalities and the Periodic Technical Inspection (PTI) requirements has been added; the general objectives have been changed to better reflect the link to the achievement of targets announced in the Communication "Towards a European road safety area (2011-2020)". A table has been added clearly explaing the different areas where the absence of availability of PTI related data constitutes a problem.

- The subsidiarity argument has been strengthened: the whole part on subsidiarity has been considerably extended notably to explain where extension of EU competences is foreseen, and where Member States should remain competent; the proportionality of the options has been explicitly addressed; finally, the reasons for choosing the preferred option have been explained in more details.

- The presentation of costs for vehicle owners and the assessment of some other impacts have been improved: the impacts on additional groups of stakeholders have been assessed in details, and emphasis has been put on the impact on SMEs who operate the vehicles, in particular micro-enterprises. The issue of the impact of the options on the competition on the internal market has also been addressed. Finally, other impacts on citizens – in particular other road users – have been assessed.

- Greater transparency has been provided on the assumptions underlying the quantitative estimates: the importance of the assumptions and their impact on the final results has been underlined; a sensitivity analysis has been held on major assumptions to check the robustness of the results. Finally, the methodology for calculating the average annual cost of testing per vehicle owner has been described in more details in a new annex.

- Apart from these major changes, many additional recommendations of the IAB have been taken into account to increase the quality and clarity of the report. Notably, a discussion on the adequate level of risk-based approach has been included in part 4.

## 2. PROBLEM DEFINITION

### 2.1. General Context

The EU legislation concerning PTI dates from 1977.[8] Currently, the PTI system in Europe is governed principally by Directive 2009/40/EC,[9] which mandates all Member States to carry out periodic safety and emission inspections for certain types of motor vehicles. It also sets minimum requirements for those inspections and their intervals. The legislation on roadside checks[10] completes the one on PTI by providing the requirement to control the technical state of commercial vehicles in between periodic inspections.[11]

Directive 2009/40/EC allows Member States to apply higher requirements for PTI concerning, notably, the frequency of testing, the items to be inspected, the vehicles covered or the minimum standards for braking efficiency.[12] Similarly, Directive 2000/30/EC on roadside inspections, while imposing only the visual inspection of commercial vehicles, allows Member States to "carry out inspections not covered by this Directive or to check other aspects of road transport".[13]

On 20 July 2010 the European Commission adopted policy orientations on road safety[14]. To reach the announced target (i.e. reducing the number of road fatalities by 50% between 2010 and 2020), the Commission proposed amongst other things a two-pronged strategy for safer vehicles: harmonisation/strengthening of EU legislation on roadworthiness tests and on technical roadside inspections (including the extension to powered-two wheelers) and the study of the setting-up of a European electronic platform with a view to harmonise and to exchange vehicle data (type approval, registration, results of inspections, etc.).

On 2 December 2010, EU Transport Ministers confirmed that safety technical requirements should be maintained and checked during the whole vehicle-life cycle through a strengthening of roadworthiness and roadside inspections, as well as an improved data exchange between Member States on inspections.[15]

### 2.2. Description and scope of the problem

Too many vehicles with technical defects on the road…

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8 Council Directive 77/143/EEC of 29 December 1976 on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers.

9 Directive 2009/40/EC of the European Parliament and of the Council of 6 May 2009 on roadworthiness tests for motor vehicles and their trailers: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:141:0012:0028:EN:PDF.

10 Directive 2000/30/EC of the European Parliament and of the Council of 6 June 2000 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Community: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0030:EN:HTML.

11 Annex 10 presents in more details the legislative framework on PTI testing in the EU.

12 The full list of allowed exceptions can be found in Article 5 of Directive 2009/40/EC.

13 Article 1 of Directive 2000/30/EC.

14 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *Towards a European road safety area: policy orientations on road safety* 2011-2020, COM(2010) 389 final.

15 Council Conclusions TRANS 16951/10.

The role of PTI is to ensure that vehicles in operation are properly maintained and tested, so that their performance remains in accordance with the type-approval[16] throughout their lifetime. However, it is, alas, observed, that a large number of vehicles are circulating on public roads in the European Union with technical defects, i.e. the performance of some of their safety or environment related parts is not any more in accordance with the requirements of the type approval.

First of all, many vehicles in use present technical defects which would make them fail the national roadworthiness tests. A Commission report[17] indicated that the share of non-compliant commercial vehicles out of the inspected vehicles in a Member State was higher than 30% for 7 countries.[18]

A 2008 study by the UK Government[19] found that about 1/3 of vehicles tested in the UK failed PTI and that this proportion had remained at about this level for some years. It also estimated that about 10% of cars on roads in the UK at any point in time have a defect that would cause them to fail the PTI test.[20] Another study on the UK established that in 2004 around 4% of heavy goods vehicles and trailers and 3.4% of large passenger vehicles had defects that were sufficiently serious for them to be prohibited immediately from any further use.[21]

It was also established that out of 3 million passenger vehicles inspected in 2004 in Germany, more than 10% of the vehicles that were 5 years old at the time of inspection, had "serious defects"[22].[23]

Secondly, there are indications that many vehicles on the roads present defects which are not inspected in the course of the national PTI or roadside inspections as they are carried out today. For instance 14 Member States do not require powered two wheelers (motorcycles and mopeds[24]) to undergo regular PTI,[25] despite documented high defect rates: the UK reports 20% of failures at PTI[26], and Germany as much as 27%.[27] Also, in most Member States the electronic safety and environmental systems such as ABS, ESC and airbags are not – or not sufficiently – tested. The importance of these systems is capital: for example, the Electronic

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16 The "type-approval" is defined in Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles.

17 European Commission report on the technical roadside inspection of the roadworthiness of commercial vehicles, COM(2010) 754 final.

18 See also Annex 6: *Failure rates in roadside tests, 2007-2008*.

19 'MOT Scheme Evidence-base' Department for Transport, UK, 2008.

20 Ibid., p.25.

21 VOSA (2005), after: CITA (Comité international de l'inspection technique automobile), *AUTOFORE Report: Study on the future options for roadworthiness enforcement in the European Union*, Brussels 2008.

22 The concept of "serious defect" is not defined in the study. Commission Recommendations 2010/378/EU qualify defects as "minor", "major" and "dangerous".

23 Comité international de l'inspection technique automobile (CITA): AUTORE Report on the Future Options for Roadworthiness Enforcement, 2007

24 Motorcycles include heavy quads, mopeds include light quads.

25 Cf. Annex 7.

26 'MOT Scheme Evidence-base', op. cit.

27 AUTOFORE (2007), op.cit. *after* Federal Motor Transport Authority (Kraftfahr Bundesamt KBA) 2008

Stability Control (ESC) reduces the risk of being involved in a crash by between 20% and 40%.[28]

…which cause accidents, injuries, fatalities…

The link between higher roadworthiness requirements and improvements in terms of road safety can be divided into two elements: on the one hand, the impact of the technical condition of the vehicles on road safety; on the other hand, the relation between higher roadworthiness requirements and better average technical condition of vehicles.

The CARE database[29], which contains an assessment of the main causes of accidents, is for the Commission the main source of empirical evidence on the link between the condition of the vehicles and road safety. However, the assessment of the causes of the accidents is mostly performed on the spot by policemen who typically don't have the expert technical knowledge necessary to identify a technical defect. The data is therefore not fully reliable.

Having said that, a large body of literature is available on the causes of road accidents. Studies of vehicles involved in accidents have shown that technical defects contributed to between 3% and 19% of accidents.[30] Empirical evidence from Germany has shown that technical defects are contributing to around 10% of accidents.[31] For this IA, a broadly agreed and more conservative average figure of 6% responsibility of technical defects in accidents of cars is used.[32] The defects of safety related electronic systems are estimated to contribute even more to accidents.[33]

Solid investigation results also show that 8% of the accidents involving motorcycles are caused or linked to technical defects.[34] Motorcycle riders are the group of road users with the highest safety risk, which moreover defies the overall diminishing trend in the number of fatalities.[35] Also moped drivers are overrepresented in the number of fatalities, with more than 1,400 drivers killed on the roads in 2008.

In what concerns the relation between higher roadworthiness requirements and better average technical condition of vehicles, available scientific data is scarce. In order to check if such a relation exists, the Commission classified the Member States according to the level of requirements they set in their national PTI systems, ranging from the minimum requirements as set in Directives 2009/40/EC and 2000/30/EC to very high requirements.[36] In table 1 below, this level of requirements is compared to the number of road fatalities per million inhabitants

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28 Thatcham research News, Special edition 2009, *http://www.thatcham.org/research/pdfs/research_news_vol4_issue6_se.pdf.*

29 Community database on Accidents on the Roads in Europe; Council Decision 93/704/EC.

30 Ibid.

31 Federal Statistics Office, Germany Amtliche Verkehrsstatistiken, 2009.

32 This figure is contained in a study covering Europe: DEKRA (2005) "Internationale Strategien zur Unfallvermeidung", in "Technische Sicherheit im Straßenverkehr", DEKRA Fachschrift 58/05. DEKRA Automobil GmbH, Stuttgart.

33 AUTOFORE (2007), op. cit.

34 Motorcycle Road Safety Report 2010 (DEKRA)

35 Between 2001 and 2010, fatalities among motorcycle drivers increased by 13% to 5,115, while overall road fatalities fell by 43% - source: CARE Database, DG MOVE.

36 The methodology for establishing this classification is further explained in section 2.3.1 below and in Annex 14.

(used as a proxy for road safety). This comparison indicated a clear correlation between the level of stringency of PTI and the level of road safety[37].

*Table 1:* Correlation fatalities per million inhabitants and test-quality requirements and member States

| *Member State* | *Fatalities per million inhabitants* | *Requirements on test quality* |
|---|---|---|
| ***Malta*** | 36 | No more as in EU Legislation |
| ***Netherlands*** | 41 | Higher than in EU legislation |
| ***Sweden*** | 43 | very high |
| ***UK*** | 43 | Higher than in EU legislation |
| ***Germany*** | 55 | very high |
| ***Ireland*** | 63 | Higher than in EU legislation |
| ***Finland*** | 65 | very high |
| ***Spain*** | 68 | Higher than in EU legislation |
| ***France*** | 69 | Higher than in EU legislation |
| ***Luxembourg*** | 72 | very high |
| ***Denmark*** | 74 | Higher than in EU legislation |
| ***Italy*** | 79 | Higher than in EU legislation |
| ***Austria*** | 81 | Higher than in EU legislation |
| ***Portugal*** | 83 | Higher than in EU legislation |
| ***Belgium*** | 88 | very high |
| ***Estonia*** | 98 | Higher than in EU legislation |
| ***Hungary*** | 99 | No more as in EU Legislation |
| ***Slovakia*** | 103 | No more as in EU Legislation |
| ***Czech Republic*** | 103 | Higher than in EU legislation |
| ***Cyprus*** | 103 | No more as in EU Legislation |
| ***Slovenia*** | 106 | No more as in EU Legislation |
| ***Greece*** | 138 | No more as in EU Legislation |
| ***Bulgaria*** | 139 | No more as in EU Legislation |
| ***Latvia*** | 139 | Higher than in EU legislation |
| ***Romania*** | 142 | No more as in EU Legislation |
| ***Poland*** | 143 | No more as in EU Legislation |
| ***Lituania*** | 148 | No more as in EU Legislation |

In 2009, 35,000 fatalities on European roads have been reported.[38] Assuming that technical defects contribute to fatalities proportionately to their contribution to accidents, more than 2,000 fatalities per year in the European Union may be linked to technical defects of vehicles.[39] Based on available studies,[40] between 900 and 1,100 of these could be avoided if

37 Malta is an exception, but due to the small size of the country the figures are not representative

38 CARE Database, DG MOVE

39 Number of fatalities linked to technical defects calculated as 6% of total 35,000 fatalities.

adequate improvements to the roadworthiness testing system were put in place. The range of 900-1100 fatalities is retained in this report as an indication of the conventional (without using most costly measures) life-saving potential, of measures aimed at enhancing PTI rules.

…and environmental damage

Vehicle defects also increase emissions (e.g. CO, HC, NO and $CO_2$) by some 1.2% and 5.7%,[41] depending on the vehicle and fuel type. A large fraction of total emissions is due to a minority of vehicles with malfunctioning emission control systems.[42] 5% of the vehicle fleet causes 25% of all pollutant emissions and 20% of vehicles cause 60 % of pollutant emissions.[43] The problem is aggravated by so-called 'gross-emitters': the difference in hydrocarbon and carbon monoxide emissions of petrol engines between a properly adjusted and maintained engine and one that is poorly adjusted can amount to a factor of four or more.[44]

It has been shown that, by identifying vehicles that have maintenance problems and requiring that they are repaired, the average vehicle emissions could be reduced substantially.[45] In this respect, the Commission's report on the Auto Oil II Programme[46] concluded that:

- with regard to three way catalyst equipped vehicles (TWC), a properly operating inspection program for TWC cars could have the potential to reduce emissions in the order of 35% for CO, 25% for HC and 5% for $NO_x$;
- with regard to non-catalyst and oxidation catalyst equipped vehicles, such inspection program would have the potential to achieve a 15% reduction in CO emissions;
- with regard to Diesel vehicles, the emission reduction potential is about 25% in particulate matter (PM).

## 2.3. Underlying drivers of the problem

The results of the stakeholder consultation and the analysis undertaken by the Commission have allowed to identify two main root causes to the problem described in section 2.2 above. First, the scope of EU legislation is too narrow and the level of requirements it sets is too low. Second, information and data vital for the effectiveness of testing and enforcement of test results is not exchanged between concerned actors.

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40 AUTOFORE (2007) and 'MOT Scheme Evidence-base', op. cit.

41 AUTOFORE (2007), op.cit.

42 Air Pollution from motor vehicles, A. Faiz, C. Weaver, M. Walsh, 1996.

43 Lenz, Stricker, a.o., Identification of gross emitters, Wien 2001.

44 A damaged catalytic converter or a malfunctioning oxygen sensor can increase hydrocarbon and carbon monoxide emissions by a factor of 20 or more. Similar malfunctions could increase nitro oxide emissions by a factor of three to five. In diesel vehicles a worn out or damaged fuel injection system can increase emissions of particulate matter at least twenty fold.

45 Ibid.

46 Auto Oil Study, 2000, http://ec.europa.eu/environment/archives/autooil/pdf/auto-oil_en.pdf.

### *2.3.1. The scope of EU legislation is too narrow and the level of requirements it sets are too low*

The EU roadworthiness control system is based on seven pillars:

*Table 2: The seven pillars of the EU roadworthiness testing*

| | |
|---|---|
| (1) | Items to be inspected and inspection method |
| (2) | Definition of defects and assessment of result of test |
| (3) | Equipment to be used |
| (4) | Skills and application of staff |
| (5) | Vehicle classes to be inspected |
| (6) | Frequency of testing[47] |
| (7) | Supervision of the testers |

A comparative analysis of national PTI systems indicates that most Member States have set national requirements for several of the seven pillars at a level which is higher than required by EU legislation. Table 3 provides the classification of Member States for pillars 4 and 7.[48] The situation is similar for other elements of the roadworthiness control system.[49]

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47 For roadside testing, this would relate to the number of vehicles targeted for roadside tests each year.

48 This classification compares the organisation of PTI in different Member States, in particular the level of independency of PTI centres, the education requirements for testers and the existing accreditation systems.

49 Annex 7 indicates for instance, that only 8 Member States have set testing frequency at the minimum level required by the Directive, while 19 apply more stringent requirements; 18 Member States expanded the obligation of PTI to categories which are not covered by Directive 2009/40/EC, notably motorcycles, agricultural tractors and light trailers; finally, most Member States roadside inspections involve more than the visual inspection of the vehicles required by Directive 2000/30/EC (Cf. table 6.4. in annex 15).

*Table 3: Classification of Member States according to the level of qualifications and supervision of inspectors*

| *Requirements for the qualifications (pillar 4) and supervision of inspectors (pillar 7)* | *Member States* |
|---|---|
| ***No requirements as in Directives 2009/40/EC and 2000/30/EC*** | Bulgaria, Cyprus, Greece, Hungary, Italy, Lithuania, Malta, Poland, Romania, Slovenia. |
| ***Higher requirements than in the EU legislation*** | Austria, Czech Republic, Denmark, Estonia, France, Ireland, Latvia, Netherlands, Portugal, Slovakia, Spain, United Kingdom |
| **Very high requirements** | Belgium, Finland, Germany, Luxembourg, Sweden |

Source: Europe Economics, op. cit.

It therefore appears that the requirements of European legislation are probably set below what is perceived as an adequate scope and level of requirements by the majority of Member States. This conclusion is supported by the results of the stakeholder consultation.

*Box 1: Consequences in terms of recognition of test results between Member States*

The low level and scope of the European standards results in a heterogenous transposition of Directive 2009/40/EC into national legislations. As a result, some Member States refuse to fully honour Article 3 of the Directive which stipulates that "each Member State shall, on the same basis as if it had itself issued the proof, recognise the proof issued in another Member State showing that a motor vehicle registered on the territory of that other Member State, together with its trailer or semi-trailer, has passed a roadworthiness test complying with at least the provisions of this Directive"[50]. This provision has been in place in the PTI legislation since Directive 77/143/EEC. Despite this fact, Member States often refuse to recognise the certificates issued by other Member States for re-registration purposes and require a new test to be performed according to national rules before re-registration can take place. The European Court of Justice has stated at many occasions on the illegal character of such practices (the last time in case C-170/07 Commissions vs. Republic of Poland), but the problem has not so far been entirely resolved.

The analysis that follows identifies the main gaps and shortcomings of current EU legislation, classified according to the seven pillars identified in Table 3.

(1) Items to be inspected and inspection method

It has already been explained above that Directive 2009/40/EC does not set the obligation to thoroughly inspect electronic safety devices such as ABS, ESC, airbags, etc…[51] Even more items are left outside the scope of Directive 2000/30/EC on roadside inspections, which requires only the inspection of the braking system and exhaust emissions and requires as little as a visual assessment of these elements or checking of a recent PTI certificate.[52] This led to the introduction of more stringent inspection standards in several Member States.

In light of the above, it is not surprising that there are huge differences between how roadside inspections are carried out in Member States.[53] The proportion of vehicles found at the

50 Directive 2009/40/EC, Article 3.2.

51 By the amendment brought by Directive 2010/48/EC visual inspection of the “malfunction indicator lamp (MIL) for electronic safety systems has been introduced.

52 Directive 2000/30/EC, Art. 4.1.

53 European Commission report on the technical roadside inspection of the roadworthiness of commercial vehicles, COM(2010)754.

roadside inspection not to be compliant with roadworthiness requirements ranges from as little as 0.3% in Bulgaria to 63% in Denmark[54], with significant differences even between neighbouring countries.[55] Some Member States perform an elaborated test procedure close to a PTI test where others – still complying with the minimum requirements of the Directive - do a visual inspection or simply control the documentation. The huges differences in the failure rates at roadside checks result also from the choice between a risk-based approach in some Member States (UK, Luxembourg, Austria, etc…) against random checks in others (Poland, Germany, etc…), both being compliant with the requirements of the Directive.

(2) Definition of defects and assessment of result of test

Annex II to Directive 2009/40/EC contains a description of the reason for failure for each of the items to be inspected. However, Art. 5 thereof allows Member States to require higher minimum standards for braking efficiency than those specified, and several Member States decided to use this opportunity.[56] This is understandable in the light of the fact that the standards for brakes contained in Directive 2009/40/EC are very old, and a strong case exists for their re-examination.[57]

In 2010, the Commission has issued a Recommendation on the assessment of defects.[58] While it is too early to make conclusions on the effect of these recommendations, the fact that they are not binding will always leave the possibility for major or dangerous defects being considered as minor in some Member States and vice versa, leading to inconsistent messages being sent to vehicles owners.

(3) Equipment to be used

Current EU legislation mostly does not contain specific requirements for the equipment to be used during testing. Whereas Directive 2010/48/EU[59] has introduced some general requirements[60], there is a variety of equipments in use. Several of equipment types on the market do not make possible the detection of serious defects such as loose axles. The fact that inspection centers are not obliged to use the most efficient tools therefore means that even the defects which are already covered by Directive 2009/40/EC can not always be properly detected.

(4) Skills and application of staff

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54 Cf. Annex 6.

55 For example, suspension defects are found in 1.3% of inspected vehicles in Belgium and over 15% in the Netherlands. On the contrary, chassis defect concern only 9.2% of vehicles stopped in the Netherlands against close to 25% in Belgium.

56 E.g. While EU legislation allows maximum brake difference of 30% between the left and right side, Germany and Austria have put in place more stringent standards (respectively, 25% and 20%).

57 AUTOFORE, op. cit. Only brake efficiency limits for new vehicles have been updated by Directive 2010/48/EU.

58 Commissions recommendations of 5 July 2010 (2010/378/EU).

59 Commission Directive 2010/48/EU of 5 July 2010 adapting to technical progress Directive 2009/40/EC of the European Parliament and of the Council on roadworthiness tests for motor vehicles and their trailers. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:173:0047:0072:EN:PDF.

60 such as, e.g. "Visual inspection with vehicle over a pit or on a hoist. Wheel play detectors may be used and are recommended for vehicles over 3,5 tonnes gross vehicle mass". Directive 2010/48/EU, Annex II point 4.5.1.1.

Directive 2009/40/EC does not set minimum requirements for the education and skills of staff performing the PTIs. In view of the rising complexity of testing, the insufficient qualifications of testers can be a major hindrance to the effectiveness of controls and the level of detection of defects.

(5) Vehicle classes to be inspected

Directive 2009/40/EC does not require to test certain categories of vehicles, including light trailers, powered two-wheelers or agricultural tractors. As a result, 14 Member States do not provide for periodic inspections of motorcycles, 10 Member States – of light trailers, and 16 – of agricultural tractors.[61] Among these, at least for powered two-wheelers there is strong evidence supporting their inclusion among the vehicle types which are regularly inspected.

(6) Frequency of testing

Annex I to Directive 2009/40/EC defines minimum frequency of testing for different categories of vehicles.[62] Evidence suggests that for certain of these categories the frequency is too low to ensure optimal levels of roadworthiness of vehicles in use. The problem concerns in particular three types of vehicles:

– passenger cars in business use, which despite belonging to the group of high mileage vehicles, caracterised by high defect rates, are treated for PTI frequency purposes like normal cars;

– older vehicles: according to available evidence, defect rates are proportional to the age of the vehicle; despite that fact, Directive 2009/40/EC foresees the same, not increasing frequencies for all vehicles above 4 years of age.

– commercial vehicles, which deteriorate at a much higher rate than passenger vehicles due to their higher weight and mileage, but are inspected only twice as frequently.[63]

(7) Supervision of the testers

Insufficient supervision of testing centres can have a negative impact on road safety. This has been confirmed by the recent experience of Denmark, where complete liberalisation of PTI was accompanied by an increase in the number of fatalities.[64] Also in Germany, competition for clients between the two major players on the market of PTI – DEKRA and TUV – and the liberalisation of the PTI market was assessed by the German authorities as detrimental to the

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61 Cf. Annex 7.

62 Based on time elapsed.

63 Cf. Annex 12 for deeper analysis of the testing frequency of these vehicles.

64 PTI was completely liberalised in Denmark in 2005. An internal audit, performed by Denmark's State Audit (http://www.rigsrevisionen.dk/media(1073,1033)/11-2008.pdf), on the liberalised PTI sector concluded that the expectations to quality have not been fulfilled. The auditors stated that of all re-inspections of recently inspected vehicles carried out by the Ministry's Transport Agency in 2008, 47% disclosed inadequate tests against 41% in 2007 (one-quarter of all errors detected in 2007, and one-third of all errors detected in 2008 were significant). The auditors therefore underlined the importance of supervision by the authorities to ensure consistent vehicle testing and equal criteria to pass or fail PTI. At the same time accident statistics from Denmark showed an increase in the number of fatalities between 2006 and 2007 by 30%. The number of fatalities remained at that level also in 2008.

quality of testing and pushed the latter to strongly enhance supervision with additional inspections, mystery shopping, etc...

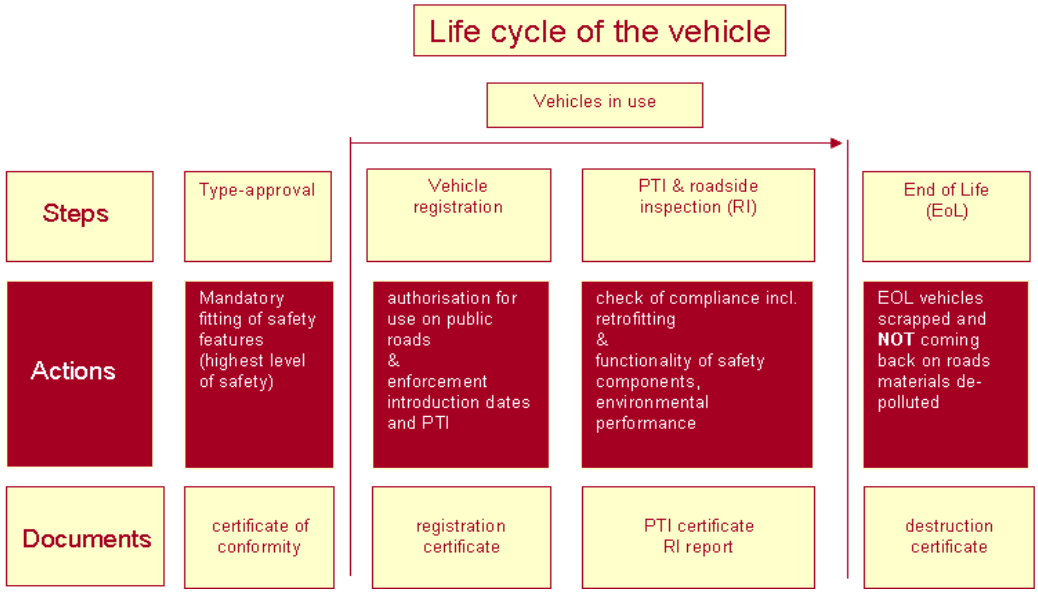
Despite these examples, Directive 2009/40/EC contains very little requirements on the supervision of testing centres.[65] This leaves a lot of flexibility to the Member States concerning the choice of the supervision model and does not prevent them from opting for suboptimal solutions like in the above mentioned examples.

### *2.3.2. Information and data vital for the effectiveness of testing and enforcement of test results is not exchanged between concerned actors*

As illustrated in Figure 1, PTI and roadside inspections are part of a wider regulatory scheme[66], governing the vehicles throughout their lifetime. Despite existing interconnections and interdependences (notably with type-approval and registration), EU legislation does not regulate the exchange of information between the different elements of the scheme and related authorities. This has a negative impact on the effectiveness and enforcement of roadworthiness testing.

In the course of PTI and roadside inspections, an important amount of data on the vehicle and its performance is collected. This data could potentially be used by the different authorities to ensure the follow up of the detection of defects, to organise targeted checks, but also to enhance their policy making. Similarly, PTI and roadside inspections would be more effective if they had access to complete information on the history of the vehicle and its technical characteristics. However, as it will be explained below, current scarce provisions in EU legislation about the exchange of PTI-relevant data are not sufficient to allow the effective flow of data to and from PTI centres.

*Figure 1: Roadworthiness testing as a part of the vehicle control regulatory scheme*




Source: DG MOVE

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65 Article 2 of the Directive only vaguely mentions that "where establishments designated as vehicle testing centres also perform motor vehicle repairs, Member States shall make every effort to ensure the objectivity and high quality of testing".

66 Annex 11 contains a more detailed description of the general vehicle regulatory scheme.

(1) Data for testing electronic safety components is often not available

The importance of testing electronic safety components (ESC, ABS, Airbags, etc) during PTI has been explained in section 2.2. However, testing of electronic systems needs the possibility to have access to their control units[67] to be able to communicate failure codes or to check the functionality of the electro-mechanical components. Currently, these tests cannot be performed by many PTI test centres because necessary technical information from the manufacturers is not available to them in an electronic format.

Electronic safety components have become essential tools for reducing the risk and the negative consequences of road accidents. The Electronic Stability Control (ESC) reduces the risk of being involved in a crash by as much as between 20% and 40%.[68] Airbags, according to different studies, reduce the risk of fatality in case of a frontal crash by 8-18% both those wearing seat-belts and those who don't.[69] The impossibility to test these equipments – imputable to the lack of a proper system for the PTI test centres to access the necessary information – has therefore a very serious impact on the safety of the road users, taking into account the fact that electronic safety components brake down as often as mechanical parts. Article 6 of Regulation 715/2007/EC on type-approval requires manufacturers to "provide unrestricted and standardised access to vehicle repair and maintenance information […] through websites using a standardised format".[70] However, this requirement was designed mainly to ensure access to data by independent repair shops. As a result, it is not precise enough concerning the data requirements of PTI centres.[71] Moreover, Article 7 of the same Regulation allows manufacturers to "charge reasonable and proportionate fees for access to vehicle repair and maintenance information", which makes it costly for PTI centres to access the data. According to the best knowledge of the Commission, only one Member State (Germany) has so far decided to centrally purchase the data from the manufacturers and provide it to the testing centres. In the remaining 26 Member States, the situation is more complicated.[72]

(2) The potential of odometer readings is not used

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67 Control units are microcomputers which control the activities of electronic safety components (eg regulating brake forces on different wheels when ABS is active).

68 Thatcham research News, Special edition 2009, *http://www.thatcham.org/research/pdfs/research_news_vol4_issue6_se.pdf.*

69 Peter Cummings, Barbara McKnight, Frederick P Rivara, David C Grossman, Association of driver air bags with driver fatality: a matched cohort study, http://www.bmj.com/content/324/7346/1119.full.pdf; And: Elisa R. Braver, Susan A. Ferguson, Michael A. Greene, Adrian K. Lund, Reductions in Deaths in Frontal Crashes Among Right Front Passengers in Vehicles Equipped With Passenger Air Bags, http://jama.ama-assn.org/content/278/17/1437.abstract.

70 Regulation (EC) No 715/2007 of the European Parliament and of the Council of 20 June 2007 on type approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:171:0001:0016:EN:PDF.

71 AUTOFORE, op.cit.: "At present, except for exhaust emission control systems, […] there are no agreed standards for on-board diagnostic systems. Each manufacturer has developed its own systems and protocols […] and defined the failure threshold levels. This makes interrogation of the operational integrity of the systems very difficult and expensive for inspection agencies."

72 A recent Belgian study found that 18% of a sample of vehicles could not be checked for faults in items such as ABS and airbag because of data problems. (source: AUTOFORE, op. cit).

Information on the real mileage is crucial for a second hand vehicle's price and the buying decision by the consumer. Mileage fraud is considered to affect between 5% and 12% of used car sales (30% to 50% for cross-border transactions) having a yearly economic effect of € 5.6 billion to 9.6 billion (EU 25).[73] Properly collected and aggregated odometer readings would also provide valuable input to transport statistics, where currently yearly mileage of different vehicle classes is modelled, often showing a significant difference to reported real data.[74]

As an answer to these problems, Directive 2010/48/EU has introduced the requirement to test the odometer for signs of manipulation and for defects[75], and to register the odometer reading on the roadworthiness certificate.[76] Without further legislation, the effect of the two provisions will be limited. Indeed, the most effective manner to detect odometer fraud is to compare the present reading with previous ones, checking if mileage grows with time. Currently, there is no obligation to present certificates from previous tests when passing a PTI, and information on odometer readings is not exchanged between testing centres.

In what concerns statistics, Directive 2010/48/EU requires PTI centres to check odometer readings, but does not impose on Member States the obligation to collect the data and does not provide any standards for doing it. As a result, there is no uniform framework that would allow the monitoring of the total and average mileages of different categories of vehicles registered in Europe. Data is provided only on a commercial basis by a number of private analysts, but it is expensive and not always entirely reliable.

(3) PTI certificates are not fraud-proof

The PTI certificate often constitutes the only proof against which enforcement authorities (police, roadside inspectors, etc…) check if the vehicle meets the environmental and safety standards of roadworthiness. Despite this capital importance for enforcement, the EU legislation does not define requirements for the security of the document. Directive 2010/48/EU only says that "the vehicle operator or driver must be notified in writing of the defects, the results of the test and the legal consequences". Very often, the PTI certificate is therefore a simple printout, which can easily be subject to fraud. As the exchange of data between PTI centres and the authorities is not regulated (see below), this fraud can go undetected most of the time.

(4) Data on PTI results not available to enforcement authorities

PTI centres are in charge of inspecting the technical state of the vehicles, but the enforcement of the results – taking defective vehicles off the roads and punishing their drivers – is the role of authorities such as the police, roadside inspectors, registration authorities, which have a number of tools at their disposal: fines, de-registration of vehicles, withdrawal or refusal to renew operator permits for access to the international transport market, etc…

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73 Study of the economical impact of mileage fraud, CRM used car management (in Proceedings of Cars 2010 conference, Brussels, 18 November 2010).

74 For example, emissions from road traffic can only be calculated based on calculation models for the annual mileage of vehicles. These models result in significant discrepancies to real mileage of vehicles. Differences up to 400% have been identified as shown by the tables in Annex VI (Mobility Study in Germany vs Fleets/Tremove calculation model).

75 Directive 2010/48/EU, Annex II, par. 4, point 7.11.

76 Directive 2010/48/EU, Annex II, par. 3.

The availability of PTI results in electronic format would help performing targeted roadside checks based on number plate recognition, sending reminders by registration authorities and enforcing circulation bans. However, the current lack of rules at European level governing the exchange of information between PTI centres and enforcement authorities makes the use of these tools difficult.

The situation is further aggravated by the persisting lack of recognition, at re-registration, of PTI certificates issued by another Member State (see Box 1). This recognition is particularly important for ensuring the continuity of roadworthiness enforcement for the 3.4 million vehicles which are re-register yearly in another Member State.[77] The continuity of enforcement is notably essential for detecting odometer fraud, defects resulting from tampering and those which are the consequence of accidents. It is also worth to mention that additional tests after re-registration constitute unnecessary cost in terms of money and time for the vehicle owner.

The table below presents in details the areas where data related to PTI is crucial but currently often unavailable.

*Table 4: Areas where the availability of PTI related data is crucial*

| *Area* | *Issue* | *Description* |
|---|---|---|
| ***Inspection*** | Certificate of Conformity (CoC) Data + technical information | For assessing the compliance of a vehicle with its technical composition at the time when it was put on the market, the information based on the CoC data (e.g. approved dimension of tyres, number of seats) as well as additional technical information for each single vehicle (e.g. secondary braking system, suspension system) is needed |
| | ABS / ESC | For an enhanced testing of ABS or ESC communication has to set up between the testing equipment (OBD-connector) and the on board control unit of these systems to trigger the actuators (interface between pure electronic system and the mechanic/hydraulic system) e.g. to apply certain brake force to a certain wheel. |
| | Airbag | Set up communication between the testing equipment (OBD-connector) and the on board unit of the airbag(s) to check their presence and to read out fault codes |
| ***Market*** | Odometer fraud and second hand vehicles market | Information on the real mileage is crucial for the vehicle's price and the buying decision by the consumer.[78] The absence of mandatory odometer reading contributes to the low level of buyers' confidence. Mileage fraud is considered to affect between 5% and 12% of used car sales having an economic effect on a EU25 scale between 5,6 and 9,6 billion €.[79]<br><br>At the cars2010 conference[80] a study on mileage fraud[81] has been |

77 DG Clima, *European second hand car market analysis*, February 2011.

78 SOURCE: DG SANCO, FOURTH EDITION OF THE CONSUMER MARKETS SCOREBOARD - "MAKING MARKETS WORK FOR CONSUMERS"(WORKING DOCUMENT, DRAFT VERSION, AUGUST 2010)

79 STUDY OF THE ECONOMICAL IMPACT OF MILEAGE FRAUD, CRM USED CAR MANAGEMENT (IN PROCEEDINGS OF CARS 2010 CONFERENCE, BRUSSELS, 18 NOVEMBER 2010)

80 WWW.CARS2010.EU.

81 THE ECONOMICAL IMPACT OF MILEAGE FRAUD AND THE COST BENEFIT ANALYSIS OF THE CAR-PASS SYSTEM

| | | |
|---|---|---|
| | | presented providing the following estimation of the problem: Mileage fraud is for national transactions in the range of 5% to 12% and at cross border transactions at a range of 30% to 50%. In the case of Germany these values would lead to a monetary effect in the range of €725 Mio to €1.357 Mio per year. The scale of the problem was confirmed by different other presentations from UK, CZ, HU and FR. Extrapolating the quoted figures for EU 27 the monetary effect would be in the range of €4.030 Mio to €7.539 Mio. |
| | Re- registration | Data for vehicle registration are derived from the Certificate of Conformity (CoC) document which is generally only available at first registration. Re-registration is done with the information contained in the registration document of the previous registration. If data is missing - as the amount of mandatory data on registration documents is minimised – such data has to be retrieved from the vehicle manufacturer. |

*Box 2: Current situation concerning PTI-related data storage and exchange*

Today data for and from roadworthiness testing is stored in disparate locations and following disparate methodologies:

***Certificate of conformity***

For each single vehicle, produced in series, that is put on the market the vehicle manufacturer is issuing a Certificate of Conformity (CoC) which contains the basis technical information retrieved out of the type-approval certificate. The content of the CoC document is fully harmonised[82] and can be provided in an electronic format. For single approved vehicles, following the single approval requirements[83], the national approval authorities are issuing a single approval certificate which has to follow the CoC requirements regarding its content. Single approval certificates are electronically stored on a national basis by the majority of Member States. German's Kraftfahrtbundesamt is currently hosting an EU wide database on type-approval certificates.

***Registration***

Vehicles that are allowed to be used on public roads have to be registered[84] by the Member States. Member States operate for the administration of this registrations national registration databases where the required data[85] are kept.

***PTI results***

Vehicle testing authorities / organisations are in general using IT solutions to gather the information during vehicle testing for establishing the roadworthiness certificate. The content of such certificates is EU wide harmonised[86] and uses the numerical system for test items and related defects as provided by the existing roadworthiness legislation.

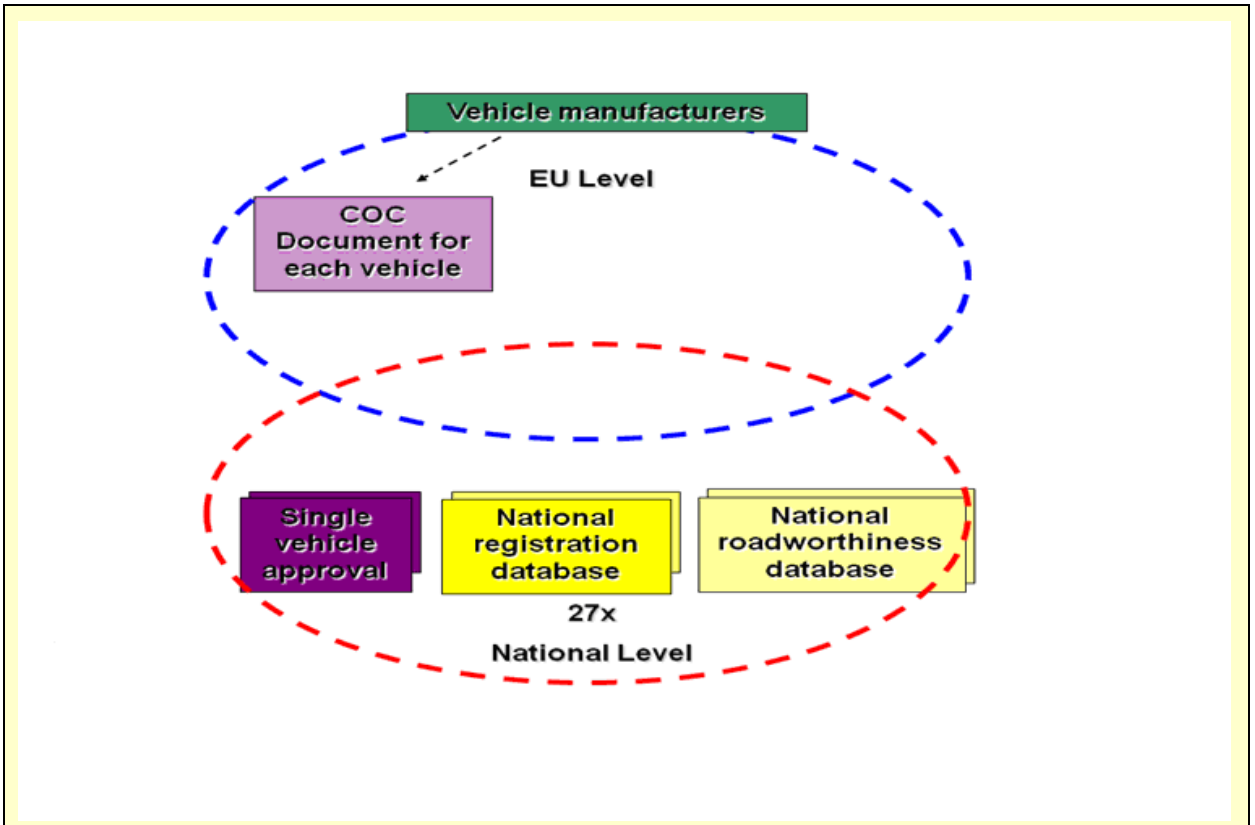
82 Regulation (EC) No 385/2009.

83 Art. 24 of Directive 2007/46/EC on the type approval for vehicles and their parts and components.

84 Directive 1999/37/EC on the registration documents for vehicles defines registration as the official authorisation for the use on public roads and the issuing of a number (registration number) for its identification.

85 Directive 1999/37/EC provides in its Annex I a harmonised set of mandatory and optional data for registration documents.

86 Directive 2010/48/EU introduces a harmonised roadworthiness certificate.




The above figure and the description above clearly show that most of the data which is needed to make the roadworthiness system more effective (in particular technical specifications from type approval, as well as data on registration and PTI results, but not technical specifications for testing electronic equipment) is already individually collected and stored. However, the different databases are currently not connected, which makes it impossible to exploit their potential for increasing the effectiveness and strengthening the enforcement of roadworthiness.

## 2.4. Who is affected by the problem?

**Road users** – including pedestrians – are the group most affected by the problem, since they are the victims of accidents involving vehicles with technical defects. **The citizens** at large are affected by the second major impact of defectious vehicles, i.e. excessive air pollution. Inhabitants of cities are disproportionately more affected by this problem since the concentration of air pollution is highest in the urban environment.

**Owners and operators of commercial vehicles** can also be seen as affected by the problem, since unequal roadworthiness standards across the European Union distort the competition between road transport undertakings.

**Vehicle owners** will necesseraly be concerned by any policy solutions that bring changes to the roadworthiness system. In particular, an increase in the stringency of tests and controls will imply higher compliance costs.[87]

**Vehicle manufacturers and PTI centres** might be affected by any solution which requires them to share data for free. Currently, manufacturers can sell technical data and PTI centres

[87] The cost of maintaining vehicles to a higher standard and a higher cost of inspections themselves.

are selling data on vehicle mileages. However, vehicle manufacturers will benefits from the possibility to provide information in one single format and not to be obliged to adapt vehicles to 27 conflicting testing systems. Moreover, inspection centres will not have to gather any more data necessary for the inspection, as it will be readily available via the data exchange system. **Testing equipment manufacturers** are affected since low testing requirements limit the value of their market and they have to follow 27 different requirements.

Finally, **authorities** are concerned in two ways: most importantly, the lack of easily available information on PTI results greatly limits the possibilities of enforcing roadworthiness through roadside inspections, registration policy and operating permits; secondly, the fact that odometer readings are not properly collected means that the national and European authorities do not have reliable statistics on vehicle use.

## 2.5. Evolution of the problem (baseline scenario)

The failures identified as drivers of the problem are *regulatory* in nature. They could evolve in any direction depending on the policy choices of Member States. The Commission has hardly any knowledge on the possible orientations of such choices in the future, apart from the fact that Netherlands and the United Kingdom have been looking at possibilities to *reduce* the frequency of PTI to save costs for vehicle owners, which would by definition have a negative impact on roadworthiness. On the EU side, the technical annexes to Directive 2009/40/EC will be updated regularly to take into account technological advances, as it has happened so far.[88] However, since the Directive allows only the list of test items and testing methods to be updated through commitology, no change to the scope and frequency of testing, and to the framework for data exchange, can be achieved in the baselie scenario.

Available projections concur to conclude that the vehicle fleet in Europe will increase in the future. The Commission estimates that, in a no policy change scenario, the number of passenger cars will increase from 220.2 million in 2005 to 307.1 million in 2050.[89] More vehicles in principle increase the risk of accident occurrence.

At the same time, the ambitious policies announced in the Road Safety Policy Orientations for 2010-2020 are expected to increase road safety. In particular, large hopes are related to the development and deployment of Intelligent Transport Systems (ITS) and related pervasive technologies and tools. On the other hand, the latter will increase the complexity of on-board electronic equipment, which is difficult to test under the present conditions since the technical data from manufacturers are not currently available in functional form. Overall, it is expected that the downwards trend in fatalities is maintained,[90] but it is probable that the share of accidents caused by technical defects will rise from the current 6%.

On the environment side, pollutant emissions will be drastically reduced as vehicles compliant with older Euro classes are gradually scrapped and new, zero-emission vehicles are marketed. As it happens, the incidence of heavy polluters (due to technical defects) on air quality will become proportionally higher.

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88 The last amendment was Directive 2010/48/EU.

89 Primes-Tremove, reference scenario.

90 The goal set for the next ten years in the Policy Orientations on Road Safety is to reduce yearly fatalities by 50%.

Finally, according to a recent report on the Second Hand Car Market[91], the number of cross-border re-registrations of vehicles in the EU is likely to increase from the current 3.4 million to 5.3 million in 2050. This will increase the magnitude of the problems related to the absence of exchange of data between the authorities and the testing centres in different Member States.

## 2.6. Does the EU have the right to act?

The right to act for the EU in the field of transport is set out in the Treaty on the Functioning of the European Union. More particularly, Art. 91 of the Treaty puts on the legislators the obligation to lay down measures to improve road safety.

Road transport – individual, passenger and particularly commercial – has a strong cross border aspect. This is particularly important for enforcement, where effectiveness depends on the seemless flow of information about the technical state of vehicles, the compliance history and fraud detection between different authorities in different Member States. Similarly, vehicle manufacturing is global, and action addressing the provision of data for PTI purpose by the manufacturers clearly has to be taken at the highest possible level.

Out of the seven pillars of the EU roadworthiness testing, as presented in Table 2, the following are fully or nearly fully within the competence of MS: the definition of defects and assessment of results; equipment to be used; skills and application of staff; supervision of the testers.

For the remaining pillars, which are partly covered by the existing Directives 2009/40/EC and 2000/30/EC, exemption possibilities and a lot of flexibility is left to the Member States in their transposition. Most notably, the Directives give the MS the possibility to define themselves high PTI standards which reflect the common objectives in terms of road safety and environment protection. The reality shows that these opportunities have not been seized by all the MS to establish high levels of roadworthiness control, resulting in a diversity of testing qualities across the continent. The baseline scenario considerations above show that this situation is likely to continue and even worsen in the future. This trend can be only reversed by concerted action at EU level.

The optimal level of intervention of the EU remains to be established. In order to avoid falling in the trap of looking at legislative solutions only, the Commission will also analyse the impacts of an intervention based purely on soft-low, including peer reviews and screening, research on optimal PTI solutions, awareness campaigns focusing on vehicle owners, enhancement of roadside inspections and testing as well as supervision by Member States, as well as recommendations for voluntary action by vehicle manufacturers. A mixed soft and legislative approach will also be assessed.

The Commission believes that some aspects of the review of the roadworthiness system should be left to the MS, who can achieve the goals in a more effective way. In particular, this would concern the following aspects:

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91 Öko-Institut e.V., Transport & Mobility Leuven, COWI, *European second-hand car market analysis* – Final report, February 2011.

- Roadside technical inspections: while the amendment of the relevant Directive would set general rules and objectives, the choice of the exact way on how to reach these objectives would be left to the MS.

- Training: In the policy options based on legislative action, DG MOVE intends to provide general curricula for the training of the inspectors, but would leave the organisation of these trainings to the MS.

- Supervision: DG MOVE believes that the Commission should provide the standards for supervision, but leave their execution to the MS.

## 3. OBJECTIVES

### 3.1. General objectives

As indicated above, the Commission adopted in July 2010 the policy orientations on road safety 2011-2020, with the target of halving the overall number of road deaths in the European Union between 2010 and 2020. The 2011 White Paper on Transport provides the additional goal of moving to zero fatalities in road transport at the horizon 2050. There is also an ongoing debate and a number of ongoing initiatives addressing the problems of air pollution and climate change.[92]

In this context, the two general objectives of this initiative are:

1. To contribute to the achievement of the goal of halving the overall number of road deaths in the European Union between 2010 and 2020 and moving to zero fatalities in road transport by 2050, through measures aiming at increasing the quality and better coordinating national PTI and roadside inspection systems, and

2. To contribute to the reduction of the emissions of GHG and air pollutants from road transport through measures aiming at detecting more effectively and removing from circulation vehicles which are over-polluting because of technical defects.

### 3.2. Specific objectives

In light of the root causes identified in section 2.3 above, the general objective can be translated into two specific objectives:

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92 On 18 January 2011 the Commission held an orientation debate (PV(2011)1944) to discuss further elements of the air quality programme. The meeting concluded that improving air quality is a pressing need and a shared responsibility requiring joint efforts. The Commission also prepared a staff working paper on the implementation of EU Air Quality policy (SEC (20011)342). In this document, the promotion of clean and energy efficient road transport vehicles plays a strong role, in line with the Communication a European Strategy on clean and energy efficient vehicles (COM(2010) 186 final). The EU also adopted an integrated energy and climate change policy in December 2008 (COM(2008) 30 final) including ambitious targets for 2020, the so called "20-20-20 strategy", which notably envisages to cut greenhouse gases by 20% (30% if international agreement is reached). Finally, in the 2011 White Paper on Transport (COM(2001) 144 final), the Commission set the goal of reducing the greenhouse gas (GHG) emissions from transport in Europe by 60% till 2050 compared to 1990 levels.

(1) Increase the scope and the level of requirements for roadworthiness testing and roadside controls across the European Union;

(2) Create the appropriate framework for seamless flow of information between actors and Member States involved in the enforcement of PTI results.

*Table 5: Correspondence between problem, problem drivers and objectives*

| *Problem* | *Drivers* | *General objectives* | *Specific objectives* |
|---|---|---|---|
| ***Too many vehicles with technical defects on the road*** | 1. Scope and level of requirements for roadworthiness testing and roadside controls are too low | ***1. To increase road safety through better and more coordinated PTI and roadside inspections*** | 1. To increase the scope and the level of requirements for roadworthiness testing and roadside controls across the European Union |
| | 2. Information and data is not exchanged between concerned actors | ***2. To reduce emissions from road transport through better and more coordinated PTI and roadside inspections*** | 2. To create the appropriate framework for seamless flow of information |

### 3.3. Operational objectives

The specific objectives can be translated in turn into the following two operational objectives, to be reached three years after the entry into force of all elements of the new legislation (including the set-up of the data exchange system):

(1) Reduce the number of fatalities caused by technical defects by as close as possible to 1,100 yearly, which has been estimated as the maximum potential; and

(2) Move towards eliminating the "gross emitting" vehicles from the fleet in use.

The choice of the time horizon (three years after the entry into force of the legislation) is dictated by the delay in the effectiveness of proposed measures. In particular, any change to the PTI system will have a direct impact on vehicles only at the moment when they are called for a PTI. Currently, as a minimum standard, vehicles of four years and more of age must undergo a PTI every two years.

## 4. DESCRIPTION OF POLICY OPTIONS

In light of the above, the Commission has identified a set of policy options – besides the baseline scenario – that combine specific EU actions across the two areas for action described in section 2 above. The design of policy options builds on the achievements and deficiencies of current policies outlined in section 2. All policy options have been designed to be able to address both specific objectives defined in section 3 on a standalone basis.

At this stage, it is worth noting that the Commission has also considered the discontinuation of EU action. Under this option, the EU would withdraw from regulating the requirements for PTI and leave it to the Member States to decide on the optimal testing needs to ensure the roadworthiness of vehicles. However, this Policy Option has been discarded at an early stage, since 'doing less' would not be in line with the recently adopted EU policy orientation on road safety and the strategic policy directions outlined in the Commission's White Paper – Roadmap to a Single European Transport Area,[93] Further, 'doing less' at EU level would most probably result in more diverse national PTI schemes within the EU. It can therefore not be excluded that the developing differences at national level may also lead to less rigorous PTI testing procedures in some cases. This could ultimately result in more accidents due to technically non-fit vehicles and therefore impact negatively on road safety and air pollution and climate change.

Policy options 2a-c (on a standalone basis and as part of options 3a-c) reflect the need to move towards a more risk-based approach to PTI and roadside inspections. In PTI, such risk factors as vehicle age and mileage (passenger cars in business use) are proposed to be taken more into account for the testing frequency. In roadside inspections, options 2a-c foresee targeted checks, which are more sophisticated in options 2b and 2c.

As regards targeted technical roadside inspections the Commission is aware of the fact that some countries have adopted a more comprehensive risk-based approach to roadworthiness testing. Notably in the UK, company profiling is used for targeted checks in the context of roadside inspections. A similar system at the European scale could be imagined. Based on the result of RSI a risk rating of companies could be set up. A similar system is already in place for the purpose of checking driving- and resting time (Article 9 of Directive 2006/22/EC) and for the rules concerning the conditions to be complied with to pursue the occupation of road transport operator (Regulation (EC) No 1071/2009 Article 16). National registers on road transport undertakings containing the most serious infringements have to be installed and will be interconnected by a European network (ERRU) mentioned in Figure 2 of the IA report.

Compliant transport undertakings benefit from targeted roadside checks as they are less likely to be interrupted in their operational activities by unpredicted ad hoc controls.

The concept of targeted roadside control is already established in the aquis communautaire for the control of driving time and resting periods for the professional transport of goods and passengers. Given that, Member States may use the arrangements established for those purposes without any additional investments. Therefore all policy options (apart from business as usual) include the concept of targeted checks to be applied to technical roadside inspections.

As regards periodic roadworthiness tests the targeted approach through company profiling could also be used to determine different frequencies of periodic roadworthiness testing for compliant and non-compliant operators. To avoid unfair competition and destruction of the market, such a regime would have to be put in place in all Member States and become effective once the data exchange and the profiling of companies is fully operational.

Estimating that 20% of commercial vehicles are operated by the best performing operators and such vehicles will have to show up for PTI every second year instead of every year until the

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93 COM (2011)144 final.

age of 6 years[94] would lead to a reduction of up to 8.9 million tests per year for commercial vehicles. This would result in a reduction of the overall compliance costs by € 890 million.

However, the potential benefits of the profiling of European transport companies have to be seen in the light of the potentially very large costs of the set up and maintenance of such a profiling system. Those costs being probably much higher than the benefits, it was decided not to include company profiling system for periodic roadworthiness tests in any of the policy options but to generally foresee targeted technical roadside inspections.

### 4.1. Policy Option 0 - 'No policy change' approach

Policy option 0 (PO 0) provides the reference case against which the effects of other policy options are compared.[95] Within this option, the present EU legal framework for PTI and roadside inspections would be maintained. Also, there would be no short-term adaptation of the technical annex of Directive 2009/40/EC, since the annex has been recently amended through comitology (with Directive 2010/48/EU). The scope and frequency of PTI will therefore not change in PO 0, and no further measures related to the exchange of information will be adopted. The absence of a framework for exchanging data will persist.

Table 6 below describes the baseline in more details.

94 TÜV BUS-REPORT 2010/2011 AND VERKEHRSSICHERHEITSREPORT LKW 2009(DEKRA)

95 See in this respect section 2 above on problem definition for the description of the baseline scenario.

*Table 6***:** *Current legal framework at EU level*

| Components | Elements | Content |
|---|---|---|
| **Minimum EU standards for PTI and roadside inspections** | **Technology and Procedures** | **General:** pit or power lift<br>**Brake testing:** roller brake test bench, brake pressure measurement for power brakes<br>**Lights testing:** head lamp aiming device<br>**Emissions testing:** CO – lambda for petrol and K-value measurement for Diesel engines<br>*Items only need to be visually inspected and procedures for the use of roller brake testing are as mentioned as a reference to ISO 26096.* |
| | **Frequency of Tests** | **For passenger cars ($M_1$) and vans up to 3.5t ($N_1$):**[96] first inspection after four years, then every two years (4-2-2);<br>**For buses and coaches ($M_{2,3}$), trucks ($N_{2,3}$), heavy trailers ($O_{3,4}$), taxis and ambulances:** every year (1-1-1) |
| | **Vehicle Categories Covered** | Vehicles with at least four wheel carrying passengers ($M_1M_2M_{3)}$<br>Vehicles with at least four wheel carrying goods ($N_1N_2N_3$)<br>Heavy trailers ($O_3O_4$) |
| | **Personal Skills and Qualifications** | no definition |
| | **Supervision and Enforcement** | special measures if non-public bodies are involved (Art. 2 of Directive 2009/40/EU) |
| | **Road side inspection** | Roadside Inspections – Reporting to the Commission |
| **System for data exchange** | **Data exchange** | none |

## 4.2. Policy Option 1 - Soft law approach

Policy Option 1 (PO 1) would consist in a better implementation and better monitoring of the application of existing legislation.

96 An explanation on the vehicle categories is contained in annex 9. Vehicle categories in accordance with Annex II of Directive 2007/46/EC establishing a framework for the approval of motor vehicles and their trailers and of systems, components and separate technical units intended for such vehicles (OJ L 263, 9.10.2007, p.1).

This option would not introduce new legislation, but there would be new and increased efforts by the Commission to improve the standards of testing and enforcement, as well as actions to incentivise the exchange of data.

In practice, these efforts would encompass an increased use of peer reviews and screening by the Commission and the exploration of optimal levels of investment in PTI and roadside testing in cooperation with the Member States. Furthermore, under this policy option, the Commission and Member States would explore the scope for risk-based testing regimes, including e.g. vehicle warranty and age, mileage, or the previous involvement of the vehicle into an accident. The option would also include looking into the enforcement of legal responsibilities of individuals not presenting their vehicles to required PTI. Enforcement measures would include awareness campaigns focusing on vehicle owners, enhancement of roadside inspections and testing as well as supervision by Member States. Finally, to ensurre better availability of data for inspections, PO 2 would include recommendations for voluntary action by vehicle manufacturers.

### 4.3. Policy Option 2 - Legislative approach

Policy Option 2 would be based on two components.

In order to meet the first specific objective, the first component is to revise upwards the minimum EU standards for PTI and RSI and define mandatory standards for all the seven pillars of the roadworthiness system.[97] This is essential to avoid that gaps in the system (eg. one of the pillars left over) reduce the effectiveness of roadworthiness enforcement as a whole. Three alternative scenarios for minimum standards will be identified (see section 4.3.1).

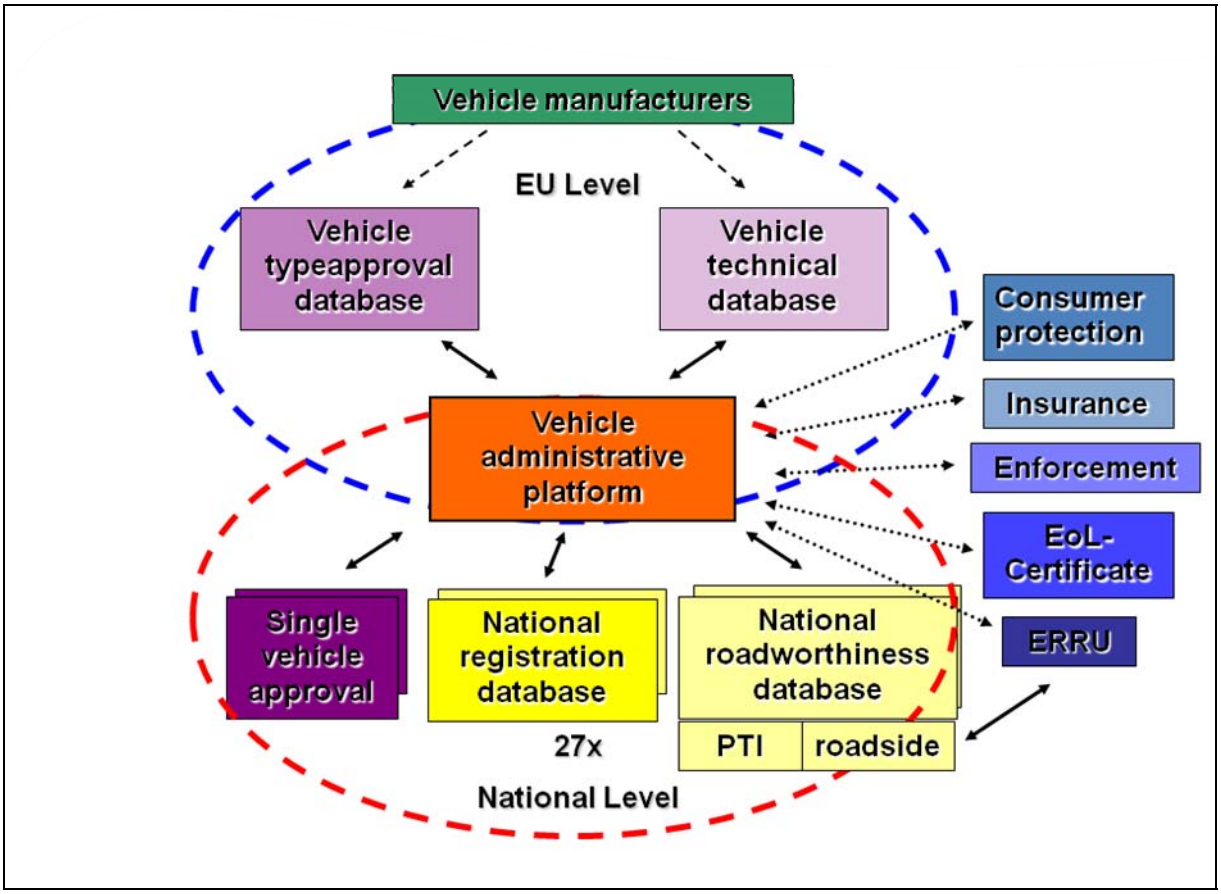
In order to meet the second specific objective, the second component is to put in place a harmonised data exchange system linking the existing databases and ensuring:

- the access by all PTI centres to data at the level of the Certificate of Conformity and the data on electronic safety systems (such as ABS/ESC/airbags/…);
- the exchange of inspection results between Member States, with accessibility of most important enforcement authorities to the system;
- the reporting of inspection results – and in particular odometer readings – by PTI centres to national and European authorities for enforcement and statistical purposes.

Figure 2 provides an illustration of how such a system would complete and connect existing databases to untap their potential for increasing the effectiveness of testing and roadworthiness enforcement. Figure 2 should be compared with Figure 1 in section 2.3.2.

[97] Cf. point 0 for the list of the seven pillars of roadworthiness.

*Figure 2: The harmonised data exchange system ("vehicle administrative platform") in the context of existing and foreseen PTI-related databases*




*ERRU is the European Register of Road Transport Undertakings (Commission Regulation EU/1213/2010);
**EoL stands for "End of Life" (Directive 2000/53/EC).
Source: DG MOVE.

In order to protect the fundamental rights of those citizens whose data might be exchanged through the new system, the following three principle will have to be respected:

- The purpose of the system is to exchange only data related to the vehicles, not to their owners or operators;
- Any personal data linked to the vehicles will have to be kept at national level in registration databases;
- The definition of access rights will have to guarantee that only technical, non sensitive data can be accessed.

*4.3.1. Identification of sub-options*

Policy Option 2 will be broken down in three suboptions (from a to c) according to the level of requirements. The data exchange platform will be a common element to the three suboptions for the reasons explained in section 4.3.2. below.

**Policy Option 2a: Moderate increase of minimum requirements and system for data exchange**

PO 2a increases the scope of RSI beyond checking emissions and brakes; sets detailed requirements for the equipment to be used at PTI; puts in place the obligation for government departments to perform regular quality checks on PTI centres; includes motorcycles ($L_{3,4,5,7}$) and light trailers ($O_2$) among vehicles to be inspected at PTI; pushes forward the date of the first mandatory PTI from the fourth year after registration to the third; and sets regular training requirements for inspectors, both for PTI and RSI. Table 7 summarises the content of PO 2a with changes in comparison to the baseline highlighted in grey.

*Table 7: Policy Option 2a: Moderate increase of minimum requirements and system for data exchange*

| Components | Elements of test | Content |
|---|---|---|
| **Minimum EU standards for PTI and roadside inspections** | **Technology and Procedures** | **General:** pit or power lift, automated data collection<br>**Brake testing:** roller brake test bench, brake pressure measurement for power brakes, suspension test bench<br>**Lights testing:** head lamp aiming device<br>**Testing of safety related electronic systems:** access to On-board diagnostics (OBD) to read out defect codes<br>**Emissions testing:** CO – Lambda for petrol and K-value measurement for Diesel engines, On-board diagnostics (OBD) |
| | **Frequency of Tests** | **For passenger cars (M1), vans up to 3.5t (N1), light trailers** ($O_2$) and motorcycles ($L_3$): first test after three years, then evey seond year (3-2-2)<br>**For busses and coaches ($M_{2,3}$), trucks ($N_{2,3}$), heavy trailers ($O_{3,4}$), taxis and ambulances:** every year (1-1-1) |
| | **Vehicle Categories Covered** | Vehicles with at least four wheel carrying passengers ($M_1M_2M_{3)}$<br>Vehicles with at least four wheel carrying goods ($N_1N_2N_3$)<br>Light and heavy trailers ($O_2O_3O_4$)<br>Motorcycles ($L_{3,4,5,7}$) |
| | **Personal Skills and Qualifications Supervision and Enforcement** | Personnel with technical background with yearly training on PTI of more than two days.<br>Undercover tests, regular quality checks done by governmental departments – quality assurance system following the priciples of ISO 17020. |
| | **Road side inspection** | targeted selection of commercial vehicles, which are obviously badly maintained. Checks covering all test items which are inspected at the PTI |
| **System for data exchange** | **Vehicle administrative platform** | centrally defined but regionally administered data stores holding local information only |

### Policy Option 2b: Advanced increase of minimum requirements and system for data exchange

Policy Option 2b, in addition to Policy Option 2a sets higher standards for testing equipment at PTI centres (including for testing electronic safety components) and for RSI (testing 15% of vehicles at roadside inspections with mobile roadside inspection units); increases the specific training requirements for ispectors (PTI and RSI) to 4 days a year; includes mopeds ($L_{1,2,6}$) among vehicles tested at PTI and vans ($N_1$) with commercially used small trailers ($O_{1,2}$) among vehicles tested at RSI; increase the testing frequency for older small vehicles (every year

instead of every two years for $M_1N_1O_{1,2}L_{3,4,5,7}$); sets a minimum requirement of 10% of commercially used vehicles being tested at RSI; and increases the quality of supervision of PTI centres. Table 8 summarises the content of Policy Option 2b with changes in comparison to Policy Option 2a highlighted in grey.

*Table 8: Policy Option 2b: Advanced increase of minimum requirements and system for data exchange*

| Components | Elements of test | Content |
|---|---|---|
| **Minimum EU standards for PTI and roadside inspections** | **Technology and Procedures** | **General:** pit or power lift, automated data collection and storage<br>**Brake testing:** roller brake test bench, brake pressure measurement for power brakes, suspension test bench, load simulation for trucks<br>**Lights testing:** head lamp aiming device<br>**Testing of safety related electronic systems:** On-board diagnostics (OBD), use of scan tools and functionality tests<br>**Emissions testing:** CO – Lambda for petrol and K-value measurement for Diesel engines, On-board diagnostics (OBD), use of scan tools |
| | **Frequency of Tests** | **For passenger cars (M1), vans up to 3.5t (N1), light trailers ($O_{1,2}$):** first test after three years, then after two years, then every year (3-2-1)<br>For motorcycles ($L_{3,4,5,7}$) and mopeds ($L_{1,2,6}$): first test after three years, then every year (3-1-1)<br>**For busses and coaches ($M_{2,3}$), trucks ($N_{2,3}$), heavy trailers ($O_{3,4}$), taxis and ambulances:** every year (1-1-1) |
| | **Vehicle Categories Covered** | All vehicles that are registered (M – N – L – O) |
| | **Personal Skills and Qualifications** | Personnel with technical background with yearly training on PTI of more than four days. |
| | **Supervision and Enforcement** | Undercover tests, regular quality checks done by governmental departments – quality assurance system following the priciples of ISO 17020. |
| | **Road side inspection** | Roadside inspection for vans ($N_1$) and light trailers used for commercial purpose ($O_{1,2}$) in addition to $M_{2,3}$, $N_{2,3}$ and $O_{3,4}$; 15% targeted checks with mobile inspection units out of the 10% of commercial vehicles checked |
| **System for data exchange** | **Vehicle administrative platform** | centrally defined but regionally administered data stores holding local information only |

**Policy Option 2c: Highest increase in mimimum standards and system for data exchange**

Policy Option 2c, in addition to Policy Option 2b, introduces emission testing for all categories of vehicles at RSI by the use of remote sensing technology with a target of 15% of vehicles tested; expands RSI to all categories of vehicles; and increase the frequency of testing of light vehicles ($M_1N_1O_{1,2}$ $L_{3,4,5,7}$) to yearly counting from the moment of registration and for heavier vehicles to every half a year instead of every year for $M_{2,3}N_{2,3}O_{3,4}$. Table 9 summarises the content of Policy Option 2c with changes in comparison to option 2b highlighted in grey.

*Table 9:Policy Option 2c: Highest increase in mimimum standards and system for data exchange*

| Components | Elements of test | Content |
|---|---|---|
| **Minimum EU standards for PTI and roadside inspections** | **Technology and Procedures** | **General:** pit or power lift, automated data collection and storage<br>**Brake testing:** roller brake test bench, brake pressure measurement for power brakes, suspension test bench, load simulation for trucks<br>**Lights testing:** head lamp aiming device<br>**Testing of safety related electronic systems:** On-board diagnostics (OBD), use of scan tools and functionality tests<br>**Emissions testing:** CO – Lambda for petrol and K-value measurement for Diesel engines, On-board diagnostics (OBD), use of scan tools |
| | **Frequency of Tests** | **For passenger cars ($M_1$), vans up to 3.5t ($N_1$), light trailers ($O_{1,2}$), motorcycles ($L_{3,4,5,7}$) and mopeds ($L_{1,2,6}$):**every year (1-1-1)<br>**For busses and coaches ($M_{2,3}$), trucks ($N_{2,3}$), heavy trailers ($O_{3,4}$), taxis and ambulances:** every half a year (0.5-0.5-0.5) |
| | **Vehicle Categories Covered** | M – N – L – O (all vehicles that are registered) |
| | **Personal Skills and Qualifications** | Personnel with technical background with yearly training on PTI of more than four days. |
| | **Supervision and Enforcement** | Undercover tests, regular quality checks done by governmental departments – quality assurance accreditation system according to ISO 17020. |
| | **Road side inspection** | 15% targeted checks with mobile inspection units out of the Roadside inspection for 15% of commercial vehicles vehicles, 15% emission screening with remote sensing units; RSI of other categories of vehicles recommended |
| **System for data exchange** | **Vehicle administrative platform** | centrally defined but regionally administered data stores holding local information only |

### *4.3.2. Choice of the optimal data exchange system*

The Commission initially considered all three potential technical solutions for ensuring the exchange of data from and for PTI between the involved stakeholders, being:

- Centralised data store – merging all current national databases into one single database at EU level, containing all PTI relevant information for the 27 Member States;

- Centrally defined data store with full replication of all data to each Member State – existence of national databases with information on vehicles from the whole EU; all databases would update automatically to changes introduced in one of them;

- Centrally defined but regionally administered data stores holding local information only – national databases would continue to contain only information on the vehicles registered in the given Member State, but an additional functionality would allow consulting and importing data from the other 26 national databases and from the central type-approval and technical databases.

The Commission has asked an IT expert to analyse the pros and cons of each option.[98] Very rapidly, it turned out that, given the extremely high number of inputs (over 300 million vehicles are concerned) and the diversity of types of national databases in place, only the last option is technically feasible. The centralised data store, according to the analysis, "would be cost-prohibitive and cause the vehicle testing applications of each Member State to slow unacceptably". Also full replication and merging of databases (second solution) would be "prohibitively expensive in terms of central infrastructure needs", and also "[place] a restriction on Member State initiatives for modernisation and innovation in case it disrupts the data integration. With many different application vendors each rolling out updates this option is not feasible".

For the above reasons, it has been decided to discard the first two solutions for putting in place a data exchange system and retain for further analysis only the solution of "centrally defined but regionally administered data stores holding local information only", which has the additional benefit of having been tested for other applications such as the Tachonet.[99] This solution will therefore be the common element of all the three sub-options 2 a to c.

### *4.3.3. Discussion on the legal instrument for Policy Option 2*

The European legislation on PTI is currently in the form of a Directive (Directive 2009/40/EC). The nature of this legal instrument has partly led to the large heterogeneity of the PTI systems in Europe, since the Directive in question leave a wide margin of interpretation to the Member States in the implementation of the minimum rules. One of the consequences of this heterogenity, described above, is the persisting lack of recognition of PTI certificates issued by another Member State at the occasion of a re-registration; others include the difficulties with enforcing roadworthiness rules based on unharmonised documentation and the impossibility to precisely benchmark the PTI systems due to the lack of a common reference standard.

An overall consequence of the large flexibility given to the Member States in the implementation of the Directive is that the perception of a common European road safety area is lost to the detriment of one of conflicting and competing 27 national systems. This is

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98 This analysis, performed by Centiq (www.centiq.co.uk), is presented in Appendix 4 to: Europe Economics, final report, February 2011, *Report of contribution to impact assessment of policy options to improve the EU system of PTI and of roadside vehicle testing* (see the separate annex to this IA report, pp. 153-176.

99 TACHOnet is a telematic network in operation across the EU to allow an automated exchange of information between Member States concerning the use of tachographs and tachograph driver cards. More information can be found under: http://ec.europa.eu/transport/road/social_provisions/tachograph/tachonet_en.htm.

incompatible with the approach presented in the 2011 White Paper on Transport[100] and the 2010 Policy Orientations on Road Safety, which explore common solutions for common problems. This is indeed already the approach taken by Directive 77/143/EC[101], the recital to which says that "the growth of road traffic and the resultant increase in danger and nuisances present all Member States with safety problems of a similar nature and seriousness".

Finally, Policy Option 2 in its three forms proposes to set more detailed minimum standards in a much wider range of aspects than it is currently the case. Notably, the new legislation considered under Policy Option 2 would regulate the testing equipment, the supervision regime over garages, as well as encompass vehicle categories which are currently left out. It is probable that a Directive would not any more be the most effective instrument for setting such detailed rules.

On the basis of the above argumentation, a Regulation would probably be a more appropriate tool for translating the changes to the PTI system in policy option 2 into legislation. The choice of this instrument would also be compatible with the rest of the legislative body in the vehicle control regulatory scheme (see figure 1 for more details), and notably Regulation 715/2007/EC on type-approval.

On the other hand, in what concerns the roadside inspections, experience with Directive 2006/22/EC, which determines the minimum level of enforcement required to ensure compliance with the rules set out in Regulation (EC) 561/2006 (driving times and rest periods) and Regulation (EEC) 3821/85 (tachograph), shows that a Directive can be an efficient tool for regulating roadside inspections. In this situation, subsidiarity suggests to go for the least stringent legislative tool and not to change Directive 2000/30/EC into a Regulation.

In addition, two policy elements analysed in this report will require refinement before they can be turned into legislation. These are the curricula of the training for inspectors and the detailed specifications of the data exchange systems. Both elements, foreseen by Policy Option 2a-c, will be adopted through implementing measures as annexes to the new Regulation on PTI specifications of the data exchange system and training curricula).

#### *4.3.4. Considerations on fundamental rights*

The data exchange system that Policy Option 2 puts in place relates only to vehicle related data. Strictly speaking it does not concern personal data and therefore does not affect fundamental rights. Nevertheless, there is a risk that the information exchanged becomes personal data in the meaning of Art. 2 of Directive 95/46/EC[102] once technical data can be linked to the owner of the vehicle or the driver. The legislation should be designed in a way to limit the possibility of such linking. However, it is impossible to avoid it completely, since eg. The registration authorities will have access to the details of the vehicle together with the personal data of the owner. It is therefore essential that data processing is carried out in accordance with the principles enshrined in Directive 95/46/EC, such as purpose limitation, accuracy of data, relevance of data, data collected should not be excessive, storage of data no

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100 White Paper on transport, op.cit., initiative 16.

101 The first PTI Directive – see section 2 for more details.

102 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 [OJ L 281 , 23/11/1995 P. 0031 – 0050].

longer than necessary for the purpose of collection, etc....Strict and adequate safeguard measures will need to be put in place to prevent unlawful or unauthorised access and processing of the collected data. In particular, it is important that not more of the personal data than what is strictly needed is available publicly. Measures will be in compliance with relevant fundamental rights and principles as embodied in the Charter of Fundamental Rights of the European Union.

### 4.4. Policy Option 3 – Soft law and legislative approaches combined

For reasons further explained in section 5 below, but basically related to the high cost-efficiency of Policy Option 1 and the much higher effectiveness of Policy Option 2 in all the sub-options, the combination of both options will also be analysed.

### 4.5. Summary of identified Policy Options

*Table 10: Summary table of Policy Options*

| | | ***Minimum EU standards for PTI and roadside inspections*** | ***Data exchange*** |
|---|---|---|---|
| ***Policy Option 0*** | | *No policy change* | |
| ***Policy Option 1 (PO 1)*** | | *Soft law* | |
| ***Policy Option 2*** | | *Legislative approach* | |
| | ***PO 2a*** | Moderate increase in the minimum standards for PTI and roadside testing | Data exchange platform |
| | ***PO 2b*** | Advanced increase in the minimum standards for PTI and roadside testing | |
| | ***PO 2c*** | Highest increase in the minimum standards for PTI and roadside testing | |
| ***Policy Option 3*** | | *Soft law + Legislative approach* | |
| | ***PO 3a*** | PO 2a + PO 1 | PO 2 + PO1 |
| | ***PO 3b*** | PO 2b + PO 1 | |
| | **PO 3c** | PO 2c + PO 1 | |

## 5. ANALYSIS OF IMPACT

The analysis of impacts follows the logic of a partial cost-benefit analysis. The main economic, social and environmental impacts are classified according to whether they constitute costs or benefits. Of course, what is a cost for one group can be a benefit for another: for example additional PTI generate costs for vehicle owners and benefits for the garages. The analysis below therefore deals with what can be perceived as *social* costs and benefits. In the end of the section, impacts concerning particular stakeholder groups are detailed, eg. impacts on SMEs, citizens and public authorities.

All the costs are presented in a monetized form. On the benefit side, most of the impacts related to road safety and environment were monetized, and gains in term of new jobs created

are also quantified. However, some important benefits could not be quantified and are presented in qualitative terms. Annex 13 explains the methodology used for estimating major impacts. Annex 13a contains the detailed tables with disaggregated results of the calculations.

The major weakness of the cost-benefit approach is that the conclusions to which it leads are valid under the condition that the right assumptions have been made. In particular the estimated benefits of the different options in this IA are based on assumptions concerning: the percentage of accidents which are due to defects, the detection rate of defects at PTI and the costs of congestions. In what follows, benefits are estimated based on literature-derived most probable values for the above indicators. However, in order to explore the impact on the choice of the preferred option of uncertainties related to the assumptions made, the results of a sensitivity analysis are provided in section 6.

Table 24 in section 6 presents a summary of the assessment of impacts for the envisaged Policy Options.

## 5.1. Assessment of Policy Option 1 (PO1)

### *5.1.1. Costs*

The costs of this PO1 would be mainly related to additional peer reviews and screenings. Such costs could be calculated on the basis of two additional one-day meetings of experts from Member States per year in Brussels. If these meetings were attended by two national experts from each Member State, this would result in 108 return trips to Brussels. With a daily subsistance allowance (DSA) of around € 90 per day, fixed additional allowance (FAA) of € 250 per day,[103] transport costs of around € 300 per return trip and accommodation costs of around € 100 per trip, this would equate to a cost of € 79,920.[104]

Exploring the optimal levels of investment in PTI and roadside testing would not be related to high costs, when based on exchange of best practice between Member States. Investments themselves could be done in a stepwise approach with a reduced impact on Member States' budgets. Within international organisations for vehicle testing, like the International Motor Vehicle Inspection Committee (CITA), or roadside enforcement, like Euro-Contrôle-Route (ECR), systematic exchange of best practice is already established. Furthermore, ECR has established bi- and multilateral trainings for roadside inspectors where high quality roadside inspections are trained (with or without the use of equipment).

An increase in awareness of the importance of keeping vehicles roadworthy could be achieved with a communication campaign aimed directly at citizens. The campaign could be initiated at EU level, or the EU could encourage Member States to perform campaigns at national level. The legal obligation of motorists in some Member States to keep their vehicles safe could be reinforced in such a campaign. For instance, reminders could be sent to drivers at the approach of the next date for a PTI.

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103 http://ec.europa.eu/enlargement/taiex/pdf/experts/guide_for_experts.pdf.

104 The following calculation was made: (€90+€250+€300+€100)x108.

The costs of designing and leading such a campaign could be large: the average cost of comparable EU-wide information campaigns were around €200,000 per year[105], although campaigns with significantly higher costs are not rare in the field of road safety.[106] The results of such a campaign – in the form of a significant and sustained behavioural change of vehicle owners – are alo subject to uncertainty.

Regarding roadside inspections, the costs of arranging better implementation are likely to be modest, particularly if it takes place alongside the enhanced arrangements for peer review and screening as discussed above.

*5.1.2. Benefits*

The direct benefits of this PO1 are improved average PTI testing standards and a changed behaviour of vehicle owners with regard to keeping their vehicles technically fit. Both are likely to translate into a reduction of fatalities on the roads, but it is very difficult to quantify these impacts.

A 2009 study investigating the effects of road safety campains[107] found out that they can result on average in a 9% decrease in accident levels.[108] Applying this estimation to the accidents caused by technical defects (6% - see part 2 above) and taking the simplifying assumption that the campaigns will become effective in countries with a lower level of qualifications and supervision of inspectors (see table 2) – which can be used as a proxy for the lower level of PTI as a whole – the number of fatalities reported there is about 7,605. With 6% of these fatalities linked to technical defects, about 456 fatalities have to be considered. The potential of a reduction by 9% results in the range of saving of 41 lives. Using the figure of average number of fatalities, serious and slight injuries per accident provided in the CARE database, it can be derived that also 1,885 accidents, 6,930 serious injuries and 38,498 slight injuries could be avoided.

Using the standard values for monetising the cost of accidents (see annex 13 for more details on the methodology), this could be translated into a saving of € 183.7 million. The reduction in congestion resulting from the reduced number of accidents translates into an additional saving of € 9.4 million.

Additional peer reviews and screeenings, and of the exploration of optimal levels of investment in PTI and RSI are also expected to result in some increase of the average scope and level of requirements at PTI and RSI in national legislations. With the available evidence, it is not possible to quantify or even estimate the order of magnitude of these effects. The analysis of the impacts of POs 2 a-c gives however an idea of the overall potential – in terms

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105 Sonja Forward and Ali Kazemi (ed.), Campaigns and Awareness-Raising Strategies in Traffic Safety (CAST) (2009), *A theoretical approach to assess road safety campaigns: Evidence from seven European countries*, Project co-financed by DG Energy and Transport.

106 A Dutch seatbelt campaign carried out in 2008 costed € 490,000, and a campaign for child restrain in Austria - € 462,000. Source: Campaigns and Awareness-Raising Strategies in Traffic Safety (CAST) (2009) "A theoretical approach to assess road safety campaigns: Evidence from seven European countries" Project co-financed by DG Energy and Transport

107 Sonja Forward and Ali Kazemi (ed.), op.cit.

108 According to weighted average effects and calculated after accounting for publication bias. The results also showed that road safety campaigns resulted in a 25% increase in seatbelt use, a 16% reduction in speeding, a 37% increase in yielding behaviour and a 16% increase in risk understanding.

of road safety and environment protection – of measures aimed at increasing the level and scope of PTI requirements.

*Table 11 Summary of estimated costs and benefits of PO 1*

| ***Estimated costs (annually)*** | | | ***Estimated quantified benefits*** | |
|---|---|---|---|---|
| ***Peer reviews and screenings*** | **Communication campaign** | **Total** | **less accidents/ fatalities (monetised value)** | **Cost savings due to less congestion** |
| ***€ 79,920*** | € 200,000 | € 279,000 | 1,885/41<br>(€ 183.7 million) | € 9.4 million |
| | | | ***Estimated non quantified benefits*** | |
| | | | *Increased road safetyy and less environmental pollution resulting from:*<br>– additional peer reviews and screenings<br>– exploration of optimal levels of investment in PTI and roadside testing | |

## 5.2. Assessment of Policy Option 2a (PO 2a)

### *5.2.1. Costs*

*Equipment*

PO 2a includes the setting of basic requirements for the equipment to be used at PTI centres. A major share of the testing centres in the EU already use compliant equipment, but exact numbers are not available. In order to estimate the total costs of necessary upgrades, and with the approval of PTI experts from DEKRA,[109] the classification according to the level of qualifications and supervision of testers (see table 2) was used as a proxy. It was assumed that the Member States which did not set additional requirements for these two elements are also the ones where PTI centres do not meet the basic requirements for testing equipment as set in PO 2a. Table 10 below indicates the number of PTI centres in each of the three categories of Member States.

[109] DEKRA is one of the world's leading expert organisations, which was a partner of Europe Economics in the preparation of their report for the present Impact Assessment.

*Table 12: Number of testing stations per category of Member States, established according to the requirements for the qualifications and supervision of inspectors*

| ***Requirements for the qualifications and supervision of inspectors*** | ***Member States*** | ***Estimated number of test stations[110]*** |
|---|---|---|
| ***No requirements as in Directives 2009/40/EC and 2000/30/EC*** | Bulgaria, Cyprus, Greece, Hungary, Italy, Lithuania, Malta, Poland, Romania, Slovenia | 14,000 |
| ***Higher requirements than in the EU legislation*** | Austria, Czech Republic, Denmark, Estonia, France, Ireland, Latvia, Netherlands, Portugal, Slovakia, Spain, United Kingdom | 40,500 |
| ***Very high requirements*** | Belgium, Finland, Germany, Luxembourg, Sweden | 40,500 |
| | **Total (approx.)** | 95,000 |

Source: DG MOVE analysis based on Europe Economics, DEKRA, CITA.

The main costs for upgrading equipment to the level imposed by PO 2a would be the following[111]:

– € 10,000 for new suspension test bench;

– € 4,000 for equipment for testing modern electronic devices (OBD read out);

– the "automated data collection" mentioned in PO 2a will use existing equipment.

Depreciating the above total costs of € 14,000 over five years would lead to an annual cost of € 2,800 a year, which would lead to an aggregated annual of € 39.2 million for the technical upgrade.

*Staff*

It has been estimated[112] that ensuring that inspectors have a technical background and that they are trained specifically for the purpose of PTI at least two days a year will increase the labour costs by approximately 20% for those PTI stations where this is not yet the case. *Grosso modo*, this corresponds to the centres located in the Member States belonging to the first category in table 10. These 14,000 testing centres employ approximately 28,500 testers.[113] Based on the wages for technical staff of the countries concerned provided in the Standard Cost Model, the 20% increase in the employment costs for PTI inspectors will translate into € 73.1 million per year.

The requirement to use inspectors with technical background set in PO 2a also applies to roadside inspections. The cost of technical labour for RSI at € 12 per vehicle on average.[114]

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110 DG MOVE estimate based on figures from DEKRA and CITA.
111 Data provided by EGEA (European Garage Equipment manufacturers Association).
112 Europe Economics, op.cit.
113 CITA, *General Questionnaire*, 2006, op.cit.
114 Europe Economics, February 2011, op.cit..

There are about 3.6 million RSI performed in the EU per year.[115] This means that the overall staff costs reach approximately € 43.2 million. Approximately half of Member States are already using staff with technical skills for the purpose of the RSI, with the other half relying on regular (non specialised) police force.[116] For these Member States, additional technical staff costs for RSI would therefore reach € 21.6 million (0.5*€ 43.2 million).

*Vehicle classes to be inspected*

PO 2a extends the PTI obligation to the motorcycles and light trailers. The cost implications to the vehicle owners for making the test can be estimated at € 20 per test.[117] However, in many Member States the test for motorcycles ($L_3$) is already mandatory. The introduction of the tests in countries where it's not mandatory yet,[118] and the increase of the frequency in those countries where the frequency is lower than 3-2-2 will result in an additional 3.49 million tests, translating into additional costs of € 70 million for all Member States.

Training for a qualification for testing powered two-wheeler can be seen as an additional cost but these costs are not significant.

PTI for light trailers is currently mandatory in 21 Member States. Applying a similar methodology as for motorcycles and assuming a cost of € 35 per test, it can be estimate that including light trailers in the list of vehicles which must undergo PTI in the remaining Member States would cost approximately € 80 million.

*Testing frequency*

PO 2a pushes one year forward the date of the first mandatory PTI and of all subsequent PTIs for private cars. This means that the minimum number of PTI in a statistical life of a car moves from 7.5 to 8 inspections per vehicle. As indicated in table 11 below, currently nine Member States have testing frequencies which translate into 7.5 inspections per vehicle. For these Member States, on average 1/34 extra inspections per year would be necessary for about 85 million vehicles. At an average inspection price of € 50, this results in an annual costs of approx. € 125 million.

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115 Report from the Commission to the Council and the European Parliament on the application by the Member States of Directive 2000/30/EC of the European Parliament and of the Council of 6 June 2000 on the technical roadside inspection of the roadworthiness of commercial vehicles circulating in the Community [Reporting periods 2005–2006 and 2007–2008.

116 Europe Economics, op. cit.

117 Ibid.

118 These are: Bulgaria, Cyprus, Greece, Finland, France, Lithuania, Malta, The Netherlands, Portugal, Romania and Sweden.

*Table 13: Overview on the number of PTI in the lifetime of a passenger car per Member State*

| *Number of inspections during average life of private cars (17 years)* | *Member States* | *Number of registered private cars * 1000* | *Number of inspections per year *1000* |
|---|---|---|---|
| ***7.5*** | Czech Republic, Denmark, Greece, Ireland, France, Italy, Cyprus, Hungary, Malta | 84,441 | 37,253 |
| ***8*** | Germany | 41,321 | 19,445 |
| ***8.5*** | Lithuania, Romania | 5,698 | 2,849 |
| ***11*** | Spain | 22,145 | 14,329 |
| ***12*** | Estonia, Portugal | 4,960 | 3,501 |
| ***13*** | Slovenia | 1,045 | 799 |
| ***14*** | Belgium, Austria, Finland, Sweden, Poland | 32,475 | 26,744 |
| ***15*** | Luxembourg, The Netherlands, UK, Slovakia | 38,695 | 34,143 |
| **17** | Latvia | 933 | 933 |

Source: Eurostat, Europe Economics, op. cit.

*Supervision of testing centres*

PO 2a imposes on Member States the obligation to regularly check the quality of PTI centres. According to the Netherlands, which already proceed with such checks, average costs can be estimated at € 0.70 per year and vehicle.[119] This includes quality insurance and other measures of the involved PTI organisations such as audit-inspection, 'mystery shopping' or statistical analysis as well as administrative costs for governments. Although there are differences in the wage levels, it was assumed that this is a good estimate for the EU average cost for supervision.

At present, some Member States (UK, S, AT, LV, NL, H, RO, EE) are having a certain level of supervision already in place, which means that the additional cost could be rather lower than € 0.70. For this reason, we apply an average value of € 0.30 per year and vehicle as the cost of adapting to the quality check requirement across the EU.[120] Following this methodology, the total costs for supervision is estimated at about € 42.6 million.

*Data exchange*

Setting up a data exchange system as foreseen by PO 2 (independently of the sub-option) would entail costs, both for the Member States and centrally for the EU. The costs can be divided into the (i) one-off capital expenditure, (ii) the ongoing operational support costs

119 As stated by Dutch Royal Service for Road Safety (RDW) during the experts workshop.

120 Europe Economics, February 2011.

(maintenance) and (iii) the administration service review costs (management).[121] The costs for PTI centres are negligible, since they wouldn't need more than a computer and an internet connection to be able to supply and receive data. Table 12 presents the costs according to this classification.

*Table 14 Cost of setting up the data exchange system*[122]

| *Yearly Costs (€ million)* | *Member States* | *EU* | *Total* |
|---|---|---|---|
| ***One-off (5-year amortisation assumed)*** | 4.3 | 0.6 | 4.9 |
| ***Maintenance*** | 2.5 | 0.4 | 2.9 |
| ***Management*** | 0.3 | 0.04 | 0.3 |
| **Total** | 7.0 | 1.0 | 8.0 |

Source: Commission calculations using cost estimates in Europe Economics, *op. cit.*, pp. 173-176.

*Cost for vehicle owners, drivers and operators*

Higher PTI and RSI standards will result in a higher number of vehicles failing the tests and more defects being detected. Vehicle owners, drivers or operators will be forced to perform a higher number of repairs after inspections, and will also be subject to a higher number of fines and more time lost at roadside inspections. These costs are difficult to estimate, but are obviously directly linked to the benefits resulting from taking dangerous and/or polluting vehicles off the roads.

**Summary of costs for PO 2a**

Table 15 below provides a summary of the quantifiable costs arising from the measures foreseen in PO 2a. The overall cost estimate would be around € 459.5 million per year.

*Table 15: Estimated costs of PO 2a*

| *Cost item* | | *annual costs (in million €)* |
|---|---|---|
| ***1*** | Equipment | 39.2 |
| ***4*** | Staff | 73.1+21.6=94.7 |
| ***5*** | Vehicle classes to be inspected | 70+80=150 |
| ***6*** | Testing frequency | 125 |
| ***7*** | Supervision of testing centres | 42.6 |
| ***8*** | Data exchange | 8 |
| **Total cost estimate** | | **459.5** |

121 Europe Economics, *op. cit.*, p. 170.

122 Data used for the calculation of these costs can be found in Europe Economics, *op. cit.*, p. 173-176.

### *5.2.2. Benefits*

#### 5.2.2.1. Road safety

The major impact of the measures contained in PO 2a relates to increased road safety. Annex 13 provides the methodology for estimating these benefits.

*Quantified benefits*

Based on the methodology used, it is estimated that PO 2a will lead to a yearly reduction of 7,391 in the number of accidents and allow avoiding 749 fatalities. In particular, 333 lives would be saved thanks to the mandatory testing of electronic safety components (testing of ESC 158 and testing of Airbag 175). Expanding the scope of vehicles tested to motorcycles will avoid 220 fatalities per year. Using the values of statistical life and risk values for injuries[123], the monetised social benefit arising from the reduction in accidents, saving of lives and avoided injuries can be estimated at € 1,576 million. The reduction in congestion resulting from the reduced number of accidents translates into an additional saving of € 16.67 million.[124]

*Non-quantified benefits*

Although no data is available to support this claim, not all defects which are detectable with the available equipment and testing methods are actually detected at PTI. The reasons for this can be numerous, among which the lack of appropriate competence of the staff on the one hand, and fraud on the other. It can therefore be expected that the specific requirements on the training of inspectors and on the supervision of PTI centres, which are introduced under PO 2a, will increase the rate of detected defects. Given the high share of vehicles with defects in the entire fleet (6%), even a small increase in the detection rate can have a substantial impact on road safety and the environment. However, given the lack of concrete data, it is not possible to estimate in quantitative terms the increase in the detection rate which can be expected as a result of the measures described under PO 2a.

PO 2a also introduces the requirement to make targeted roadside inspections for commercial vehicles, meaning that obviously badly maintained (rusted, body damaged, etc…) vehicles are inspected in priority. Those countries which already apply targeted checks (notably the United Kingdom, Austria, Cyprus, Denmark) proceed to the immobilisation (forbidding further operation) of a very significant share of the inspected vehicles – approximately 50% - while immobilisation rates in other Member States are much lower (for reference, 2.3% in Germany)[125]. On this basis, it can be expected that expanding targeted checks to all 27 Member States will have a positive impact on the effectiveness of RSI in taking off the roads vehicles with defects (in particular serious defects, which lead to immobilisation). As a result, it will have a positive impact on overall road safety, which it was however not possible to estimate in quantitative terms.

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123 Handbook on estimation of external costs in the transport sector (2008): http://ec.europa.eu/transport/sustainable/doc/2008_costs_handbook.pdf.

124 This figure relates only to accidents involving cars as it has been assumed that accidents with motorcycles don't cause huge congestions.

125 European Commission report on the technical roadside inspection of the roadworthiness of commercial vehicles COM(2010)754.

The establishment of a data exchange system, which is introduced by PO 2a, will allow better enforcement of roadworthiness test results by the authorities. For instance, registration authorities will be able to proceed to de-registration of vehicles which have not passed their PTI in the foreseen time. Similarly, police forces and roadside inspectors will have easier access to roadworthiness related data which are needed to detect and fine non-compliant drivers. Finally, the availability of data from the Certificate of Conformity and the PTI will enhance the functioning of the re-registration process for vehicles originating from another Member State. It was not possible to quantify these impacts, but it is reasonable to expect that they will be positive and significant.

5.2.2.2. Environment

More frequent testing of vehicles will allow higher detection level of big polluters. This will allow to decrease the overall yearly $CO_2$ and $NO_x$ equivalent[126] emissions of road vehicles in the EU by 0.1%. In absolute terms, this corresponds to approximately 900,000 tons of $CO_2$ and 300 tons of $NO_x$ equivalent per year, translating into monetary savings of respectively € 27.9 million and € 1.4 million. [127]

The testing of emissions using on-board diagnostics (OBD) will ease the process and therefore reduce the costs of testing for PTI centres and for the drivers, but available evidence does not suggest that it will increase the rate of detection of defects.

5.2.2.3. Employment

The higher frequency of PTI introduced by PO 2a will translate into some 6.3 million additional test per year (2.5 million test for passenger cars, 2 million test of light trailers and 1.8 million tests of motorcycles). Around 1,450 additional PTI inspectors would be needed to fulfil these requirements.[128]

5.2.2.4. Statistics and internal market

PO 2a introduces the requirement for PTI centres to report the odometer readings of tested vehicles. These readings will be collected at Member State level according to common EU standards. This will allow their use for statistic purposes, notably to feed in policy supporting models developed by the European Union and the Member States.

The availability of odometer readings with centralised access will also allow to combat more effectively the mileage fraud, which is currently distorting the second hand car market. As already mentioned, this problem is said to currently affect 5% and 12% of used car sales (30% to 50% for cross-border transactions) having a yearly economic effect of € 5.6 to 9.6 billion (EU 25) (Cf. section 2.3.2 above).

It is difficult to estimate in quantitative terms the potential of the centralised collection of odometer reading on the quality of policy making and on the internal market for second-hand cars, but it can be reasonably expected that the effects will be positive and significant.

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126 $NO_x$ equivalent represents the toxicity of all CO, HC and $NO_x$ gaseous emissions.

127 We use the methodology established by Directive 2009/33/EC on clean and efficient vehicles, which provides the price of emissions which should be used for calculating the monetary impact of CO2 emissions (€ 30/ton) and NOx equivalent emissions (€ 4,400/ton).

128 DG MOVE estimate based on CITA *General Questionnaire*, 2006, op. cit.

### *5.2.3. Summary*

The table below provides a summary of the costs and benefits expected from PO 2a.

*Table 16: Estimated costs and benefits of PO 2a*

| ***Estimated costs (annually)*** | ***Estimated benefit (annually)*** | | | | |
|---|---|---|---|---|---|
| | **reduced accidents/fatalities** | **additional jobs** | **avoided congestion** | **$CO_2$** | **Air pollutants** |
| ***€ 459.5 million*** | 7,391/749<br><br>€ 1,576 million | 1,450 | € 16.67 million | 0.97 million tons (€ 27.9 million) | 308.2 tons NOx equivalent (€ 1.4 million) |
| | *Estimated non-quantified benefits* | | | | |
| | – increase in the rate of detected defects thanks to better training of inspectors and supervision of PTI centres;<br><br>– more "heavy offenders" detected at RSI thanks to targeted roadside inspections;<br><br>- *better enforcement of PTI results by the authorities thanks to data exchange;*<br><br>- *better policy making and more reliable second-hand car market thanks to data exchange;*<br><br>- *better functioning of re-registration process for vehicles originating from an other Member State due to the availability of data (CoC and PTI).* | | | | |

## 5.3. Assessment of Policy Option 2b (PO2b)

### *5.3.1. Costs*

*Equipment*

PO 2b includes more advanced brake testing in heavy duty vehicles with load simulation. The necessary technical adaptations to the existing roller brake testers would cost € 8 000 per unit.[129] Approximately 10,000 test stations[130] in Europe would need to upgrade their equipment to stay in line with this requirement. Around 54,500 stations[131] would not yet be equiped with the enhanced equipment for testing the functionality of electronic safety components during brake tests, worth € 2,000 the piece. Overall, the investment in equipment required in PO 2b, additional to the one already required by PO 2a, would amount to € 189 million. Depreciated over 5 years, this would translate into an annual additional cost of € 37.8 million.

129 Source EGEA (European Garage Equipment Manufacturers).
130 Europe Economics, op.cit.
131 Ibid.

PO 2b also introduces the obligation to perform targeted checks with the so called "mobile inspection units". The number of mobile units required to ensure a sufficient degree of targeted checks (15% of all roadside inspections) across the EU has been estimated at 130.[132] Under these assumptions, the additional annual cost of this measure would amount to € 2.08 million.

*Staff*

In comparison to PO 2a, PO 2b increases the training requirements for PTI inspectors to at least 4 days a year. This would translate – in addition to the investment needed to meet the training requirements set under PO 2a – into an increase of labour costs by 10% in 54,500 stations.[133] These stations employ approximately 80,000 inspectors.[134] Based on the Standard Cost Model, this would mean an aggregated additional yearly cost of € 164.5 million.

The mobile test units would need to be operated by additional specialised staff. Assuming one inspector per unit this would result in an additional cost of employment reaching € 4.1 million per year.[135]

PO 2b also introduces a mandatory threshold of 10% commercial vehicles checked yearly at roadside inspections. This will require some Member States to deploy additional inspectors on the roads. It could be estimated that this would increase RSI costs for the EU as a whole by approximately € 5.5 million.[136]

*Vehicle classes to be inspected*

PO 2b extends the PTI obligation to mopeds. The cost of the tests are similar to the ones for motorcycles (average cost of € 20 per vehicle). In some Member States the test for mopeds is already mandatory. The introduction of the tests in countries where it's not mandatory yet, [137] and the increase of the frequency in those countries where the frequency is lower than 3-1-1 will result in an additional 6.17 million tests, translating into additional costs of € 123.5 million.

*Testing frequency*

PO 2b increases the frequency of the testing for older cars (at least six year old) to every year instead of every second year. This means that the minimum number of PTI in a statistical life of a car moves from 8 inspections per vehicle under PO 2a to 14 inspections under PO 2b. Based on the information provided in table 11, such an increase in the frequency will require an additional 50.4 million car tests per year compared to the situation under PO 2a. At an average inspection price of € 50, this translates into additional annual costs of approximately € 2,520 million.

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132 DG MOVE own calculations.

133 Ibid.

134 CITA, 2006, op. cit.

135 Staff costs calculation based on the Standard Cost Model.

136 Calculations using the Standard Cost Model.

137 These countries are Belgium, Bulgaria, Cyprus, Czech Republic, Germany, Greece, Finland, France, Lithuania, Malta, The Netherlands, Portugal, Romania, Sweden and UK.

PO 2b also increases the frequency of the testing for motorcycles to annual after the third year. This will result in an additional 11.23 million tests, translating into an additional cost of € 224.6 million;

15% of all road side inspections would be done using the mobile inspection units at an estimated cost of € 75[138] per vehicle. Given that it would be required to test some 3.2 million vehicles, this would result in overall cost of € 36 million per year at the scale of the EU.

*Cost for vehicle owners, drivers and operators*

The same considerations as for PO 2a apply.

**Summary of costs for PO 2b**

Table 17 below provides a summary of the quantifiable costs arising from the measures foreseen in PO 2. These costs include the costs of meeting the requirements set in PO 2a. The overall cost estimate would be around € 3,350 million.

*Table 17: Estimated costs of PO 2b*

| *Cost item* | | *annual costs (in million €)* |
|---|---|---|
| ***1*** | Equipment | 39.2 + 37.8+2.08 = 79.08 |
| ***2*** | Staff | 94.7+ 164.5+4.1 = 263.3 |
| ***3*** | Vehicle classes to be inspected | 150 + 123.5 = 273.5 |
| ***4*** | Testing frequency | 125 + 2,520 + 36 = 2,681 |
| ***5*** | Supervision of testing centres | 42.6 |
| ***6*** | Data exchange | 8 |
| **Total cost estimate** | | **3,347.48** |

### *5.3.2. Benefits*

#### 5.3.2.1. Road safety

*Quantified benefits*

Like for PO 2a, the major impact of the measures contained in PO 2b relates to increased road safety. Using the methodology presented in annex 13, it is estimated that PO 2b will lead to a yearly reduction of 36,562 in the number of accidents and allow avoiding 1,241 fatalities. In comparison to PO 2a, the measure with the greatest effect seems to be more frequent testing of older vehicles, but also the inclusion of mopeds will have an important positive impact. Finally, performance testing of electronic safety systems is expected to have the potential to save an important number of additional lives, but available evidence is not sufficient to

[138] Calculation of Europe Economics based on the Annual report of Austrian Rechnungshof (2006).

quantify this impact. The monetised social benefit arising from the reduction in accidents, saving of lives and avoided injuries can be estimated at € 4,928 million. The reduction in congestion resulting from the reduced number of accidents translates into an additional saving of € 119.3 million.

*Non-quantified benefits*

The same non-quantified benefits as in PO 2a can be expected.

In addition, PO 2b extends the RSI to other categories of vehicles than commercial vehicles and sets a minimum target of 10% commercial vehicles undergoing RSI in any given year. It was not possible to quantify the impact of these measures in terms of road safety. It can nevertheless be expected that such expansion of roadside testing will allow a greater detection rate of defects and therefore increase road safety.

Moreover, in comparison to PO 2a, PO 2b introduces higher training requirements for the inspectors involved in roadworthiness testing. While it is not possible to quantify the exact impact it will have in terms of an increased rate of detection of defects during tests, it is reasonable to expect that this impact will be positive and significant.

5.3.2.2. Environment

It was estimated that the measures contained in PO 2b would allow to decrease the overall yearly $CO_2$ and $NO_x$ equivalent emissions of road vehicles in the EU by 2%. In absolute terms, this corresponds to approximately 18,165 million tons $CO_2$ and 6,979.5 tons of $NO_x$ equivalent per year. These can be translated into monetary savings of respectively € 545 million and € 30.7 million.[139]

5.3.2.3. Employment

The higher frequency and the increased scope of PTI introduced by PO 2b will translate into some 61.7 million additional passenger car tests, and 6.4 million moped tests in addition to what would be performed under PO 2a. Around 12,000 additional PTI inspectors would be needed to fulfil these requirements.[140]

*5.3.3. Summary*

The table below provides a summary of the costs and benefits expected from PO 2b.

[139] Using the methodology established by Directive 2009/33/EC on clean and efficient vehicles (See footnote 127).

[140] DG MOVE estimate based on CITA 2006, op. cit.

*Table 18: Estimated costs and benefits of PO 2b*

| ***Estimated costs (annually)*** | ***Estimated benefit (annually)*** | | | | |
|---|---|---|---|---|---|
| | **reduced accidents/fatalities** | **additional jobs** | **avoided congestion** | **$CO_2$** | **Air pollutants** |
| ***€ 3,347.48 million*** | 36,562 / 1,241<br><br>(€ 4,928 million) | 12,000 | € 119.3 million | 18.2 million tons (€ 545 million) | 6,979 tons NOx equivalent (€ 30.7 million) |
| | *Non-quantified benefits (additional to PO 2a):* | | | | |
| | *Increased road safety resulting from the extended RSI (mandatory target for commercial vehicles and inclusion of other vehicle types)*<br><br>*Higher increase in the rate of detected defects thanks to better training of inspectors* | | | | |

## 5.4. Assessment of Policy Option 2c (PO 2c)

### *5.4.1. Costs*

#### 5.4.1.1. Equipment

PO 2c introduces the emission screening of vehicles at RSI (measurement of emission components of vehicles passing by without the necessity of stopping them) which requires the remote sensing technology. This technology is comparable to speed controls with speed-cameras. To screen the emission behaviour of 15% of the whole EU vehicle fleet 74 remote sensing units would be needed (nearly all Member States would need to upgrade their emission testing systems). Each remote sensing unit would cost € 0.2 million and could perform emission tests for 1,000 vehicles per hour.[141] This would create costs of about € 2.6 million a year, applying a 5 year period of depreciation for the investments.

*Staff*

The remote sensing units would need to be operated by additional specialised staff. Assuming three inspectors per unit and provided an annual average cost of € 55,000 per specialist this would result in an additional cost of employment reaching € 1.2 million per year.[142]

PO 2c also introduces a mandatory threshold of 15% of commercial vehicles being checked yearly at roadside inspections. This will require all Member States to deploy additional inspectors on the roads. It was estimated that establishing a 15% threshold for RSI of commercial vehicles would increase costs for the EU as a whole by approximately € 8.8 million in comparison to PO 2b.

141 Europe Economics, op.cit.

142 Staff costs calculation based on the Standard Cost Model.

*Vehicles to be inspected*

Also 15% of vehicles will be subject to an emission screening. This would result in some 71 million emission measurements. The operational costs is about € 0.1 per tested vehicle,[143] meaning that the overall yearly operational costs of the remote emission testing would amount to € 7.1 million.

*Testing frequency*

PO 2c increases the frequency of the testing for passenger cars, vans, light trailers and powered two wheelers to annual from the first year. It also increases the frequency of testing heavy vehicles to twice a year instead of once a year. This means an additional 38.4 million PTIs for passenger cars, with costs of about € 1,920 million; an additional 7.6 million tests of motorcycles with costs of € 151.3 million; an additional 7.4 million tests for mopeds with associated costs of about € 147.8 million; an additional 2.25 million tests of light trailers with associated costs of about € 78.8 million; and 47.5 million additonal tests for heavy vehicles with associated costs of € 3,562.5 million[144]. In total, the cost of higher frequency of testing in PO 2c in comparison to PO 2b would amount to approximately € 5,860.4 million.

*Cost for vehicle owners, drivers and operators*

The same considerations as for PO 2a and 2b apply.

**Summary of costs for PO 2c**

Table 19 below provides a summary of the quantifiable costs arising from the measures foreseen in PO 2c. These costs include the costs of meeting the requirements set in PO 2a and 2b. The overall cost estimate would be around € 9,227 million.

*Table 19: Estimated costs of PO 2c*

| *Cost item* | | *annual costs (in million €)* |
|---|---|---|
| ***1*** | Equipment | 79.08+2.6=81.68 |
| ***2*** | Staff | 263.3+1.2+8.8=273.3 |
| ***3*** | Vehicle classes to be inspected | 273.5+7.1=280.6 |
| ***4*** | Testing frequency | 2,681+5,860=8,541 |
| ***5*** | Supervision of testing centres | 42.6 |
| ***6*** | Data exchange | 11.2 |
| **Total cost estimate** | | **9,227.18** |

143 Europe Economics, op.cit.

144 Based on the assumption that the test for a Heavy Duty Vehicle costs € 75 (Source: CITA *General Questionnaire* 2009).

*5.4.2. Benefits*

5.4.2.1. Road safety

*Quantified benefits*

Like for PO 2a and 2b, the major impact of the measures contained in PO 2c relates to increased road safety. Using the methodology presented in annex 13, it is estimated that PO 2c will lead to a yearly reduction of 60,162 in the number of accidents (23,600 less compared to PO 2b) and allow avoiding 1,441 fatalities (200 more than PO 2b). The monetised social benefit arising from the reduction in accidents, saving of lives and avoided injuries can be estimated at € 6,175 million. The reduction in congestion resulting from the reduced number of accidents translates into an additional saving of € 199 million.

*Non-quantified benefits*

The same non-quantified benefits as in PO 2b can be expected.

5.4.2.2. Environment

Following the methodology indicated in annex 13, it was estimated that the measures contained in PO 2b would allow to decrease the overall yearly $CO_2$ and $NO_x$ equivalent emissions of road vehicles in the EU by 2.2%. In absolute terms, this corresponds to approximately 19.9 million tons $CO_2$ and 12,224 tons of $NO_x$ equivalent per year. These can be translated into monetary savings of respectively € 599 million and € 53.8 million.[145]

5.4.2.3. Employment

The higher frequency of PTI introduced by PO 2c will translate into some 47.5 million heavy duty vehicle tests, 38.4 million passenger car tests, 7.6 million tests of motorcycles, 7.4 million tests for mopeds and 2.25 million tests of light trailers in addition to what would be performed under PO 2b. Around 34,260 additional PTI inspectors would be needed to fulfil these requirements.[146]

*5.4.3. Summary*

The table below provides a summary of the costs and benefits expected from PO 2c.

[145] Using the methodology established by Directive 2009/33/EC on clean and efficient vehicles.

[146] DG MOVE estimate based on CITA 2006, op. cit.

*Table 20: Estimated costs and quantified benefits of PO 2c*

| ***Estimated costs (annually)*** | ***Estimated benefit (annually)*** | | | | |
|---|---|---|---|---|---|
| | **reduced accidents/fatalities** | **additional jobs** | **avoided congestion** | **$CO_2$** | **Air pollutants** |
| ***€ 9,227.18 million*** | 60,162/1,441<br><br>(€ 6,175 million) | 34,260 | € 199 million | 19.9 million tons (€ 599 million) | 12,224 tons NOx equivalent (€ 53.8 million) |
| | *Estimated non quantified benefit* | | | | |
| | Same as in PO2b | | | | |

## 5.5. Assessment of Policy Option 3 (PO3)

PO 1 provides some benefits in terms of road safety and environment protection at a relatively low cost. It seems that it allows the collection of "low hanging fruits" while PO2 contain much more costly, but also much more effective measures. It seems reasonable to combine the two approaches to achieve high results without foregoing the easiest gains. Table 21 provides the estimated costs and benefits of the PO 3 a to c.

*Table 21:Estimated costs and quantified benefits of Policy Option3*

| ***Policy option*** | ***Estimated costs (annually)*** | ***Estimated benefit (annually)*** | | | | |
|---|---|---|---|---|---|---|
| | | **reduced accidents/fatalities** | **additional jobs** | **avoided congestion** | **$CO_2$** | **Air pollutants** |
| ***PO 3a*** | € 459 million | 9,276/790<br><br>€ 1,759 million | 1,450 | € 26.07 million | 0.97 million tons (€ 27.9 million) | 308.2 tons NOx equivalent (€ 1.4 million) |
| ***PO 3b*** | € 3,347 million | 38,447/1,282<br><br>€ 5,122 million | 12,000 | € 192.5 million | 18.2 million tons (€ 545 million) | 6,979 tons NOx equivalent (€ 30.7 million) |
| **PO 3c** | € 9,227<br><br>million | 62,047/1,482<br><br>€ 6,359 million | 34,260 | € 208.4 million | 19.9 million tons (€ 599 million) | 12,224 tons NOx equivalent (€ 53.8 million) |

## 5.6. Considerations on administrative costs

The establishment of a system for data exchange (PO 2a-c and 3a-c) will help reduce the administrative costs of complying with the PTI requirement for vehicle owners and also

reduce the administrative procedures for authorities and PTI test stations. This will be achieved through a replacement of manual procedures with electronic data input and exchange. The related benefits are difficult to estimate in a reliable way, since cost savings are very different in each Member State, depending on their current PTI system.

The effect of the policy options on the administrative costs has been estimated in terms of time needed to complete the PTI cerficate after the test. That time concerns both the vehicle owner and the person in charge of the PTI. The data exchange platform could speed up the PTI certification process in the following manner: up to 7 minutes saved for the PTI on trucks and up to 5 minutes saved for the PTI on passenger cars.[147]

Since these reductions are limited and variable from a Member State to another, they were not included in the evaluation of the benefits.

### 5.7. Impact on SMEs from the PTI sector

Periodic technical inspections are, in many Member States (among which such big Member States as the UK and Italy), performed by independent garages. It is therefore important to identify if the proposed policy options do not impose excessive burden on SMEs.

PO 1 will not have a quantifiable impact on the garages, either in terms of costs or benefits. The additional costs for SMEs under PO 2 will mainly relate to the cost of additional equipment, cost of staff training and hiring additional staff. On the benefit side, PO 2 will increase the number of PTI performed in Europe, therefore creating additional business opportunities for PTI centres. The table below provides an overview of these costs and benefits at EU level. While this approach does not take account of the regional differences, it has the merit of allowing a full cost-benefit analysis. It shows that all sub-options of PO 2 have a positive benefit/cost ratio. The costs and benefits presented below are roughly the same for PO 3.

147 DG MOVE estimations.

*Table 22: Costs and benefits for SMEs in the PTI sector*

| *Policy option* | *Costs (€ million)* | *Benefits (€ million)* | *Benefits/costs (€ million)* |
|---|---|---|---|
| ***PO 2a/PO 3a*** | Equipment: 39.2 | Additional tests: | 1.68 |
| | Training: 73.1 | 275 | |
| | Employment: 51.4 | | |
| | **Total: 163.7** | | |
| ***PO 2b/PO 3b*** | PO 2a + | Additional tests: | 3.34 |
| | Equipment: 37.8 | 2,643.5 | |
| | Training: 164.5 | | |
| | Employment: 425.5 | | |
| | **Total: 791.5** | | |
| ***PO 2c/PO 3c*** | PO 2b + | Additional tests: | 2.92 |
| | Employment: 1,214.8 | 5,860.4 | |
| | **Total: 2,006.3** | | |

## 5.8. Impact on vehicle owners and operators

The requirement to undergo roadworthiness testing, can be seen as generating compliance costs (related to the necessity to return to base to undergo the PTI) for the commercial vehicle owners/operators, many of which belong to the category of small/micro businesses. These costs must however be estimated in light of Figure 4 in Annex 12, which shows that commercial vehicles under normal circumstances anyway need to undergo regular service and maintenance at least 4-5 times a year. The annual PTI can easily be combined in time with one of these checks. The cost of a PTI being negligible (on average 100 euro/year for a heavy commercial vehicle) in comparison with other operating costs, and neither of the policy options considering the increase of testing frequency to below 6 months, no considerable impacts in terms of increasing the compliance costs are to be expected from the proposed measures.

Another issue is the burden of PTI for SMEs using low-mileage vehicles, which need to undergo regular tests like any other commercial vehicles. The lack of reliable tools for monitoring the mileage of these vehicles is however an obstacle for designing special rules for them. Section 2.3 explains the wide spread problem of fraud on the odometer, and another recent IA study[148] showed the possibility of fraud on the tachograph (which in any case is not fitted in all vehicles). Therefore any special measures for low-mileage vehicles would require

[148] IA report on measures enhancing the security, effectiveness and efficiency of the tachograph in road transport, not yet published.

retrofitting all/parts of the fleet with reliable mileage-monitoring tools, which would probably be prohibitively costly.

Moreover, the technical condition of the vehicles deteriorates not only with mileage, but also with age. Therefore, the frequency of PTI for low-mileage commercial vehicles could be reduced only to the level applied to non-commercial vehicles of the same category (eg. Taxies with low mileage could be tested with the same frequency as private cars).

To sum up, while the compliance costs for low mileage commercial vehicles can be seen as administrative burden in a limited number of situations, it is overall a minor issue, and addressing it with currently available technology would be prohibitively costly.

### 5.9. Impact on citizens

Increasing the frequency and scope of PTI will impose additional costs on vehicle owners. With over 300 million vehicles on the roads in Europe, the average additional annual burden per vehicle owner will be close to € 1 under PO 2a, close to € 9 under PO 2b and close to € 19 under PO 2c. The same estimates are valid for PO3 a-c.[149] These figures include the time cost per capita of the time spent for an additional PTI which is equal, on average, to € 2.75.[150]

However, the same vehicle owners will also be among the main beneficiaries of the increased road safety and reduced congestion, but also reduced noise thanks to removing vehicles with technical defects from circulation, which will compensate the additional cost of testing. This will be also the case under PO1, which does not incur additional costs for vehicle owners. All these benefits will even more apply to the most vulnerable road users – the pedestrians and cyclists.

### 5.10. Impact on public administrations

Under PO 1, the EU would cover the – limited – costs of additional peer reviews and screenings and of the information campaign. Together they would amount to ca. € 279,000. Under PO 2, the additional yearly costs for public administrations would be linked to more frequent and sophisticated RSI, the supervision of garages and the set-up of the vehicle exchange data. Under PO 2a, these costs would arise to € 72.2 million, under PO 2b – to € 112.3 million, and under PO 2c – to € 129.4 million. Under each of the PO 2a-c, the yearly cost for EU – linked to the data exchange system – would be 1 million; the rest would be costs for the Member States.

Under PO 3, additional yearly costs for public authorities will be the sum of the costs they would incur under PO 1 and PO 2.

The direct benefits to both national and EU authorities would relate to the availability of more reliable statistical data.

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149 These estimates are the result of the following calculation: for each policy option, we divided its total costs by 300 million.

150 Annex 13a shows the details behind this calculation based on the average hourly wage in the EU Member States.

### 5.11. Impact on competition in the internal market

Changes to the PTI and roadside inspection system could potentially affect the competition on the international road haulage market by reducing the possibility of gain competitive advantage through non-complying with roadworthiness rules. However, the international haulage is an extremely competitive market, with notably high pressure on delivery times. In order to meet the expectations of the customers, hauliers typically invest in most modern fleets and their regular maintenance to reduce break downs and other delays. In this respect, the technical condition of the vehicles is typically not – in the reality of this market segment –an element of competition between the market players. The impact of the different policy options on the competitive situation on the internal market would be therefore negligible.

## 6. COMPARISON OF OPTIONS

All the policy options have been designed in such a way that they can meet, on a stand-alone basis, the specific objectives as set in section 3.2. However, they differ in their **effectiveness** in reaching these objectives:

PO 1, which relies exclusively on *soft law*, is expected to have an impact on the *scope and level of requirements for roadworthiness testing and roadside controls across the European Union* (specific objective 1), but this impact is impossible to estimate and probably limited. In what concerns the second specific objective, relating to the *seamless flow of data*, PO 1 addresses only one element of the identified problem driver (see section 2.3.2), i.e. the availability of data for testing electronic safety components. It does so by setting the framework for voluntary action by manufacturers.

PO 2, which relies on legislation, addresses the two specific objectives in a more complete manner. All three sub-options expand the minimum scope and increase the minimum requirements for PTI and RSI in Europe. In this respect, PO 2a introduces relatively less stringent changes, while those brought up by PO 2c are the most stringent. As a consequence, PO 2c can be seen as meeting in the most effective way the first specific objective.

In terms of data exchange, all three sub-options of PO 2 propose the same solution, i.e. setting up a system for the exchange of data between all the stakeholders. Therefore they are equally effective in meeting the second specific objective. The table below provides a classification of the policy options according to their effectiveness in reaching the specific objectives.

The effectiveness of PO 3 in meeting the objectives is similar but slightly higher than for PO2.

*Table 23: Compared effectiveness of PO in meeting the objectives (1 – most effective, 4 – less effective)*

| | PO1 | PO2a/3a | PO2b/3b | PO2c/3c |
|---|---|---|---|---|
| Specific obj. 1:"increase scope and level of PTI and RSI" | 4 | 3 | 2 | 1 |
| **Specific obj. 2:"ensure seamless flow of information"** | 2 | 1 | 1 | 1 |

In section 5 "Analysis of impacts", it was possible to quantify and monetize most costs and a major part of benefits of the four policy options against the baseline. However, some important benefits could not be monetized (impacts on employment) while others could be evaluated only in qualitative terms. The policy options can be therefore compared on the basis of a partial cost-benefit analysis, where net quantified benefits are confronted with the qualitative assessment of the other benefits. The results of this comparison are provided in table 22 below.

*Table 24: Comparison of policy options (partial cost-benefit analysis)*

| *Policy option* | *Cost (€ million)* | *Monetized benefit (€ million)* | *Monetized benefit/cost ratio* | *Other benefits* |
|---|---|---|---|---|
| ***PO1*** | **0.28** | **184** | **656:1** | *Increased average scope and level of PTI and RSI resulting from additional peer reviews and screenings and from the exploration of optimal levels of investment in PTI and roadside testing.* |
| ***PO2a*** | **459.5** | **1,622** | **3.53:1** | *- 1,450 additional jobs created;*<br><br>*- increase in the rate of detected defects thanks to better training of inspectors and supervision of PTI centres;*<br><br>*- more "heavy offenders" detected at RSI thanks to targeted roadside inspections;*<br><br>*- better enforcement of PTI results by the authorities thanks to data exchange;*<br><br>*- better policy making and more reliable second-hand car market thanks to data exchange.* |
| ***PO2b*** | **3,347** | **5,623** | **1.68:1** | *Benefits of PO 2a plus:*<br><br>*- 12,000 additional jobs created*<br><br>*- increased detection of defects at RSI due to increased scope (target numbers and all vehicle categories checked);*<br><br>*- higher increase in the rate of detected defects thanks to better training of inspectors.* |
| ***PO2c*** | **9,227** | **7,027** | **0.76:1** | *Benefits of PO 2b plus:*<br><br>*- 34,260 additional jobs created.* |
| ***PO3a*** | **460** | **1,806** | **3.93:1** | *Benefits of PO 1 plus benefits of PO 2a* |
| ***PO3b*** | **3,347** | **5,807** | **1.73:1** | *Benefits of PO 1 plus benefits of PO 2b* |
| ***PO3c*** | **9,227** | **7,211** | **0.78:1** | *Benefits of PO 1 plus benefits of PO 2c* |

From the analysis in table 22, it appears clearly that PO 1 has by far the best cost-benefit ratio, with an estimated € 656 benefit per each invested Euro. This result is based on assumptions carrying an important degree of uncertainty (see section 5.2 for the details), but the extremely high benefit-cost ratio makes this option a clearly interesting solution.

The weak point of PO 1 is that its effects are limited, with a mere 41 avoided fatalities. This raises the question of the coherence of this policy option with the EU goal on road safety as stated in the 2011 White Paper on Transport, i.e. "By 2050, move close to zero fatalities in road transport. In line with this goal, the EU aims at halving road casualties by 2020".[151] The second element of this goal was made the general objective of the Policy Orientations on road safety 2011-2020[152], which described concrete actions needed to reach it.

PO 1 does not include any of these concrete actions, and generally contributes to a limited extent only to the road safety goals.

On the contrary, PO 2, in its three versions, has been inspired by the concrete actions proposed in the Policy Orientations on road safety, and has been designed in a way to allow considerable improvements in road safety, estimated at 749 lifes saved under PO 2a, 1,241 under PO 2b and 1,441 under PO 2c. However, the measures foreseen under POs 2a-c are also very costly. As a result, the PO 2a has a cost-benefit ratio of 3.53:1, PO 2b – of 1.68:1, while the monetized benefits of PO2c are lower than the required investments.

Finally, PO 3a allows saving 790 lifes with a benefit-cost ratio of 3.93; PO 3b allows saving 1,282 lifes with a benefit-cost ratio of 1.73; and PO 3c allows saving 1,482 lifes with a benefit-cost ratio of 0.78 which means that its monetized benefits are below the required investments.

**Preferred policy option**

The above analysis indicates that PO 1 allows reaching the "low hanging fruit", i.e. achieving a limited increase in road safety and environment protection at a very low price. It is however far from exploiting the full potential of the roadworthiness system in contributing to increasing road safety, which is estimated in different studies at 900-1,100 avoided fatalities per year (see section 2.2). The tools contained in PO 2a are far more effective, since they allow avoiding 749 fatalities yearly. PO 2b – after taking into account the possible margin of error in the estimation of impacts – probably allows unleashing the full potential of roadworthiness systems in avoiding accidents, injuries and fatalities. PO 2c goes beyond what can be considered as the "normal" potential with 1,441 avoided fatalities, which explains its prohibitive cost.

In the light of the above considerations and of the EU's overarching goals in terms of road safety, the following conclusions can be made:

- PO 1 is very cost-efficient, but does not sufficiently contribute to the EU goals on road safety and environment;

- PO 2a is relatively cost-efficient and allows considerable increases in road safety and environment protection, but below what is commonly estimated as the "conventional" potential;

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151 White Paper on Transport. Roadmap to a single European transport area – towards a competitive and resource efficient transport system, COM (2011) 144 final.

152 *Policy orientations on Road Safety 2011-2020*, op.cit.

- PO 2b allows exploiting the "conventional" full potential of roadworthiness testing in increasing road safety and environment protection, and still has a positive cost-benefit ratio;

- PO 2c allows achieving slightly better results than PO 2b, but at a much higher cost (benefit to cost ratio below 1).

- PO 3 in all its versions combines the advantage of the cost-efficiency of PO1 with the effectiveness of PO 2.

The above analysis indicates that options 3a-c each allows to reach a decent level of achievement of the general objectives, and in particular the objective of contributing to halving the number of road fatalities in Europe in the upcoming 10 years. **Policy option 3b offers the highest reduction in fatalities under a positive cost-benefit ratio, and is thus seen as the preferred option.** It must however be stated that, depending on the relative preference for road safety on the one hand, and cost minimisation on the other, options 3a and 3c constitute viable alternatives.

Table 25 below provides the results of the sensitivity analysis, under which alternative assumptions concerning the percentage of accidents which are due to defects, the detection rate of defects at PTI and the costs of congestions have been explored. Calculations have been made for the following values, which were estimated as corresponding to extreme assumptions:

*Table 25: Extreme and average values used in the framework of the sensitivity analysis*

| | ***Value corresponding to the highest benefits*** | ***Average value (used in main calculations)**** | ***Value corresponding to the lowest benefits*** |
|---|---|---|---|
| ***% of accidents due to defects*** | 10% | **6%** | 2% |
| ***Detection rate of defects at PTI*** | 80% | **60%** | 40% |
| **Cost of congestion [€]** | 15000 | **5000** | 5000 |

Table 26 provides the comparison of the results in terms of benefits and cost/benefit ratio under the different assumptions. One can observe that under most extreme circumstances option 3b has a slightly negative cost/benefit ratio (when the lowest benefits of policies are assumed); similarly, when the highest responsiveness to policies is assumed, the cost/benefit ratio for option 3c becomes slightly positive. Overall however the sensitivity analysis indicates that the results of the analysis are relatively robust.

*Table 26: Results of the sensitivity analysis for PO3*

| | ***Option 3a*** | ***Option 3b*** | ***Option 3c*** |
|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| ***Costs million €*** | | 460 | 3,347 | 9,227 |
| ***max benefit*** | mil € | 1,930.9 | 8,285.7 | 9,818.8 |
| | Cost/benefit | 4.20:1 | 2.48:1 | 1.06:1 |
| ***normal benefit*** | mil € | 1,806 | **5,807** | 7,211 |
| | Cost/benefit | 3.93:1 | **1.73:1** | 0.78:1 |
| ***low benefit*** | mil € | 1,451.2 | 3,079.5 | 3,785.1 |
| | Cost/benefit | 3.16:1 | 0.92:1 | 0.41:1 |

## 7. MONITORING AND EVALUATION

Within five years after the entry into force of all elements of the new legislation (including the set-up of the data exchange system), the Commission will report to the Council and the Parliament on the effectiveness of the measures in reaching the objectives. In particular and in line with the operational objectives, the Commission will commission a scientific study to estimate if the number and proportion of accidents, injuries, fatalities and emissions attributed to technical defects has decreased and to what extent.

The Commission will use the results extracted form the national risk rating system of road transport companies for the monitoring of the compliance of commercial vehicles with the roadworthiness requirements and its impact on the number and proportion of accidents related to this category of vehicles.

The Commission will use the potential synergies stemming from the revision of the legislation on type approval for motorcycles.[153] This new regulation on type-approval for powered two- and three wheelers foresees requirements on anti-tampering measures. The enforcement of these measures, as indicated in the accompanying IA report, will be subject to roadworthiness testing (both PTI as well as RSI) and create together with the elements related to market surveillance further input for monitoring.

Further synergies will be used for monitoring and evaluation in correlation with the recently started preparation for a legislative initiative on re-registration[154]. As one of the main problems at re-registration, the availability of data will be solved via the Vehicle Administrative Platform, which will provide a deep insight into the functionality of the intra EU information exchange and will allow real time monitoring of the system.

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153 Proposal for a Regulation of the European Parliament and of the Council on the approval and market surveillance of two- or three-wheel vehicles and quadricycles COM(2010)542 final.

154 Registration of motor vehicles previously registered in another Member State http://ec.europa.eu/enterprise/policies/single-market-goods/files/car_registration/roadmap_en.pdf.

The Commission will also use the existing reporting system for roadside technical inspections, as required by Article 6 of Directive 2000/30/EC on roadside technical inspections, to monitor that Member States perform the required number of inspections of commercial vehicles. These reports will also allow to monitor the changes in the frequency of occurrence of defects resulting from the enhanced PTI system.

**Annex 1: Main acronyms and abbreviations**

CARE: Community database on road accidents

CITA: Comité international de l'Inspection Technique Automobile

CoC: Certificate of Conformity

CoD: Certificate of Distruction

DfT: UK Department for Transport

DG CLIMA : Direction General Action for Climate of the European Commission

DG ENTR : Direction General Industry and Enterpreneurship of the European Commission

DG INFSO : Direction General Information Society and media of the European Commission

DG MOVE : Direction General Mobility and Transport of the European Commission

DSA: Daily Subsistence Allowance

EAP: Environmental Action Programme

FAA: Fixed Additional Allowance

ITV: Spanish Technical Vehicle Inspection

KBA: Federal motor transport authority in Germany

OIB : Office for infrastructure and logistics of the European Commission

PTI: Periodic Technical Inspections

PTW: Powered Two Wheelers

RSI: Roadside inspections

SG : Secretariat General of the European Commission

TAXUD : Direction General Taxation and customs union of the European Commission

TFEU: treaty on the functioning of the European Union

TWC: three way catalyst

**ANNEX 1A: Bibliography**


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ACEM HTTP://WWW.ACEM.EU/CMS/MARKETFIGURES.PHP

**Annex 2: Procedural Issues**

| *Procedural step* | *Date* |
|---|---|
| IASG[155] meeting | 02.07.2010 |
| IASG meeting | 26.07.2010 |
| Internet Consultation | 29.07.2010-24.09.2010 |
| IASG meeting | 24.08.2010 |
| Experts' meeting | 31.08.2010 |
| Stakeholders' meeting | 08.09.2010 |
| IASG meeting | 29.10.2010 |
| IASG meeting | 15.11.2010 |
| IASG Meeting | 03.02.2011 |
| IASG Meeting | 23.02.2011 |
| IASG Meeting | 27.04.2011 |
| Last consultation of the IASG by e-mail | 31.05.2011 |

[155] IASG: Impact Assessment Steering Group.

**Annex 3: List of participants and summary of the findings of the expert meeting & the stakeholder meeting**

**Expert meeting – list of organisations, Brussels, 31 August 2010**

ACEA (European Automobile Manufacturers' Association)

ACEM (The Motorcycle Industry in Europe)

Belgium Ministry Transport

Centiq

CITA (International Motor Vehicle Inspection Committee)

CLEPA (European Association of Automotive Suppliers)

DEKRA

Estonian Road Administration

ETRMA (European Type & Rubber Manufacturers Association)

FEMA (The Federation of European Motorcyclists' Associations)

FIA European Bureau

Fresenius University

FSD (on behalf of BMVBS)

GOCA (Belgium)

ITS (Poland)

Ministry of Transport

RDW (Netherlands)

Road Traffic Safety Directorate

SNCT Luxembourg

TDT (Transportation Technical Supervision Poland)

Trafi (Finnish Transport Safety Agency)

Transport Malta

**Stakeholders meeting – list of Organizations, Brussels, 8 September 2010**

ACEA (European Automobile Manufacturers' Association)

ACEM (The Motorcycle Industry in Europe)

CITA (International Motor Vehicle Inspection Committee)

CSDD (Latvia Road Traffic Safety Department)

Danish Transport Authority

DEKRA

ECG (Association of European Vehicle Logistics)

EGEA (European Garage Equipment Association)

EGEA ASA (Germany)

Estonian Road Administration

ETRMA (European Type & Rubber Manufacturers Association)

FEMA (The Federation of European Motorcyclists' Associations)

FIA EB

FSD / German BMVBS

IRU (International Road Transport Union)

Ministère des transports (France)

RDW (Netherlands)

SNCT (La Société Nationale de Contrôle Technique)

TDT (Transportation Technical Supervision Poland)

TÜV SÜD

VdTÜV

**Summary of the findings**

The most important issues identified by the participants of the **expert meeting** (participants' list see annex 2) were the lack of mutual acceptance of PTI results between EU Member States, the difficulties encountered with regard to quality of vehicle testing and that in some

Member States it is observed that vehicles are moved towards testing sites where the testing quality is lower.

Experts agreed that there is a lack of information on vehicles, which would be needed for a proper inspection. Participants stated that the inspections could be improved, if information about the history of the vehicle would be available for the PTI test stations. Missing data on the vehicle would include in particular information on past PTI results, past accident occurrences and rehabilitation procedures, plus any modifications made to the vehicle. Participants proposed a harmonisation of PTI standards across the EU at least at a medium standard.

The **stakeholder meeting** was attended by various organisations, among others ACEA for the car manufacturers, ACEM representing the motorcycle industry, CITA for organisations in charge of vehicle inspections, CLEPA for the automotive suppliers, FEMA representing the motorcyclists and IRU for the road transport operators (for full list of participants see annex 2).

At the stakeholder meeting participants confirmed that the system of PTI in the EU is highly fragmented in terms of the items to be checked[156], vehicle categories, testing frequencies[157] and quality control & supervision. Several participants informed the Commission about the fact that important data, essential for the inspection of the vehicles, is often not available at the test stations.

The majority of participants were strongly advocating to harmonise the different national PTI systems and to establish an EU-wide common PTI system. The level of harmonisation requested by stakeholders included, inter alia, higher testing standards, quality control and availability of technical data.

Furthermore, according to the ETB (European Transport Board), 14% of commercial vehicles travel empty once a year to their country of registration to undergo PTI. In addition, the stakeholder meeting discussed the calculation models related to cost-benefit-analysis in the field of PTI[158], which are used in this IA report for the analysis of impacts of the different policy options.

Finally, the Dutch Royal Service for Road Safety (RDW), the organization in charge of PTI and roadside checks in the Netherlands, explained the bilateral agreement with Belgium and their future project in Spain.

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156 For example tyre-pressure is checked only in France, electronic safety systems are checked only in Germany.

157 e.g. for Powered Two Wheelers PTW

158 Prof. Dr W. Schultz, from the University of Cologne

**Annex 4: Result of the Internet consultation**

The internet consultation was launched on 29 July and lasted 8 weeks ending on 24 September 2010. It aimed at collecting the opinion of the citizens about a possible modification of PTI system in Europe. More than 9000 responses were received from citizens, Member State authorities, equipment suppliers, testing centres, garages associations and vehicle manufacturers. The results of the consultation are affected by a campaign conducted by the motorcyclists who are in general against the inclusion of Powered two wheels (PTWs) in the PTI system, according the position of the representative association. After the launch of this campaign[159] (around mid August 2010) the number of contributions raised from 400 to 9000. Moreover, some motorcyclists' websites published misleading information with respect to the internet consultation[160].

Therefore the strategy for analysing the results of the consultation is as follows: presentation of the results before the beginning of the motorcyclists' action and presentation of the overall results of the consultation.

The main results of the consultation after 3 weeks (roughly 400 answers on 17.08.2010) are:

43.6 % of respondents could see room for positive changes in PTI (e.g. 44% were in favour of the inclusion of caravans, 37% of the inclusion of all trailers, 35% of the inclusion of passengers cars in business use; 68% thought that a new technical inspection is necessary after an accident and 52% after a modification of the vehicle), 57% thought that roadside inspections should be extended to all vehicles. Moreover, 51% of the respondents were in favour of data exchange on PTI between Member States. Concerning the policy options proposed, 40% of the respondents chose the "no action" option and 30% voted for option 4a (application of the most rigorous system in the EU). This can be explained looking at the countries of origin of the respondents: 94% were from UK where the PTI system is one of the stricter in Europe.

The main result after 8 weeks is the following: more than three quarter of respondents did not see any aspects of PTI which could be improved; 39 % of respondents think that all commercial vehicles should be subject to roadside inspections; three quarters of respondents were against a fully standardised PTI system in the EU. These results need to be seen in the light of the fact that it triggered a campaign of the Federation of European Motorcyclists' Associations (FEMA)[161], launched one month after the start of the consultation, which resulted in about 5 000 responses supporting FEMA's position, which is against the inclusion of powered two wheelers (PTW) into periodic inspections.[162]

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159 See FEMA position statement on PTI http://www.fema-online.eu/uploads/documents/vehicle%20aspects/20100903_FEMA_Position_Statement_PTI.pdf

160 www.motorcyclenews.com, 22 September 2010.

161 See FEMA position on PTI http://www.fema-online.eu/uploads/documents/vehicle%20aspects/20100903_FEMA_Position_Statement_PTI.pdf, and www.motorcyclenews.com, 22 September 2010.

162 A detailed summary of the results of the consultation is contained in annex 4 and is also available on the Commission website http://ec.europa.eu/transport/road_safety/take-part/public-consultations/pti_en.htm).

Concerning the exchange of PTI results between Member States, 27 % of respondents felt that they should be available to government authorities in the EU and 15 % felt that they should be available to those carrying out tests, but almost half (48 %) were of the opinion that inspection results should not be available to either those carrying out tests or government authorities.

## Annex 5: Current legislative framework for PTI and Roadside inspections

### PTI

#### Directive 2009/40/EC (Periodic inspections of vehicles)

Directive 2009/40/EC was adopted in May 2009 as recast of Directive 96/96/EC. It Requires that vehicles registered in each Member State shall be tested for roadworthiness after a certain period; defines the categories of vehicles to be tested, how frequently the tests must then take place and the items to be tested; requires that proof of having passed a test be available; allows some exemptions[163]; Member States may bring forward the date for the first compulsory roadworthiness test and, where appropriate, require the vehicle to be submitted for testing prior to registration; shorten the interval between two successive compulsory tests; make the testing of optional equipment compulsory; increase the number of items to be tested; extend the periodic test requirement to other categories of vehicles; prescribe special additional tests; require for vehicles registered on their territory higher minimum standards for braking efficiency than those specified in Annex II and include a test on vehicles with heavier loads, provided such requirements do not exceed those of the vehicle's original type-approval.

It allows the Commission to adopt further Directives to lay down more specific rules regarding the minimum standards to be used in tests. Requires that no later than three years after the introduction of regular testing of speed limitation devices, the Commission examine whether, on the basis of the experience gained, the tests laid down are sufficient to detect defective or manipulated speed limitation devices or whether the rules need to be amended.

#### Directive 2010/48/EU (Periodic inspections of vehicles)

Directive 2010/48/EU seeks to achieve further harmonization of road worthiness testing, requires that specified testing methods should be introduced for each of the test items and includes electronic systems among the items to be tested.

#### Recommendation 2010/378/EU (Periodic inspections of vehicles)

The Recommendation provides a guideline on standards and testing methods referred to in 2009/40/EC for inspectors conducting vehicle tests in order to ensure a harmonized assessment of the failures listed in Annex II of the Directive. Three categories of failure are introduced (minor, major and dangerous defect), to reflect the seriousness of the defect, with the consequences for the use of the vehicle in that condition given.

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163 Exemptions were granted to armed forces, the forces of law and order and the fire service. Member States may, after consulting the Commission, exclude from the scope of this Directive, certain vehicles operated or used in exceptional conditions and vehicles which are never, or hardly ever, used on public highways, including vehicles of historic interest which were manufactured before 1 January 1960 or which are temporarily withdrawn from circulation.

**ROADSIDE CHECKS**

**Directive 2000/30/EC (Roadside checks)**

Directive 2000/30/EC was adopted in June 2000. It required all Member States to introduce technical roadside inspections[164] designed to improve road safety and the environment by ensuring that vehicles comply with certain technical conditions.

These roadside inspections were required to comprise at least a visual assessment of the maintenance condition of the commercial vehicle (whilst stationary) or else a check on a recent document attesting to the vehicle's technical roadworthiness. The inspection may also include a check for irregularities in one or more of the vehicle parts.

**Directive 2010/47/EU (Roadside checks)**

This new Directive updates Annex I of Directive 2000/30/EC concerns the roadside checks reports.

**Recommendation 2010/379/EU (Roadside checks)**

The Recommendation provides a guideline on standards and testing methods for the assessment of deficiencies listed in Annex II of Directive 2000/30/EC for inspectors conducting technical roadside inspections in order to achieve a more harmonized roadside testing system and to avoid unequal treatment at technical roadside inspections. Three categories of failure are introduced (minor, major and dangerous defect).

**Interpretative communication on car registration and its impact on PTI**

In order to encourage Member States to be more flexible about the registration of cars coming from another Member State, the European Commission has issued an interpretative communication on car registration issues[165.]

The communication highlights that Member States can require a new PTI before the re registration of a vehicle coming from abroad for those elements that are not covered by the previous PTI. The communication specifies that duplication of control should be avoided.

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164 Defined as: an inspection of a technical nature, not announced by the authorities and therefore unexpected, of a commercial vehicle circulating within the territory of a Member State carried out on the public highway by the authorities, or under their supervision.

165 Commission interpretative communication on procedures for the registration of motor vehicles originating in another Member State, 2007/C 68/04.

## Annex 6: Failure rates in roadside tests, 2007-2008

| *Reporting Member State* | *Vehicles checked* | *% non-compliant vehicles^* |
|---|---|---|
| **Austria** | 12,658 | 41.4 % |
| **Belgium** | 18,732 | 13.3 % |
| **Bulgaria** | 472,324 | 0.3 % |
| **Cyprus** | 919 | 197.3 %^^ |
| **Czech Republic** | 52,842 | Not available |
| **Germany** | 2,679,907 | 2.3 % |
| **Denmark** | 265 | 63.0 % |
| **Estonia** | 2,236 | 19.2 % |
| **Finland** | 9,267 | Not available |
| **France** | 1,669,391 | 3.3 % |
| **Greece** | 22,360 | 14.2 % |
| **Hungary** | 351,690 | 6.5 % |
| **Ireland** | 5,204 | Not available |
| **Italy** | 13,577 | Not available |
| **Lithuania** | Not available | Not available |
| **Luxembourg** | 896 | 33.0 % |
| **Latvia** | 9,294 | 0.5 % |
| **Malta** | 3,579 | 55.2 % |
| **Netherlands** | 4,147 | 2.8 % |
| **Poland** | 1,254,706 | 0.6 % |
| **Portugal** | 558 | 5.0 % |
| **Romania** | 43,700 | 36.8 % |
| **Sweden** | 165,263 | 20.0 % |
| **Slovenia** | 3,179 | 3.8 % |
| **Slovakia** | 4,631 | na |
| **United Kingdom** | 165,927 | 48.9 % |
| **TOTAL** | **6,967,252** | **4.2 %** |

Source: EC, Report on the technical roadside inspection of the roadworthiness of commercial vehicles COM(2010)754 final

^ The percentage of non compliant vehicles can be more than 100 % due to the counting of vehicle combinations "road train" and "articulated vehicles" as single vehicles where both vehicles or the combination or only one of them could be counted as a non compliant one.

^^ The figure of 197.3 % in Cyprus is probably based on a different method of counting.

**Annex 7: National PTI frequencies Member States**

| State | Private cars | Goods vehicles < 3,500 kg | Goods vehicles > 3,500 kg | Passenger vehicles < 8 passengers | Passenger vehicles > 8 passengers | Trailers < 3,500 kg | Trailers > 3,500 kg | Agricultural tractors | Motorcycles |
|---|---|---|---|---|---|---|---|---|---|
| ***Belgium*** | 4/1/1 | 6m/6m/6m | 6m/6m/6m | 6m/6m/6m | 3m/3m/3m | 1/1/1 | 6m/6m/6m | 6m/6m/6m | na |
| ***Bulgaria*** | 3/2/1/1 | - | 1/1/1 | - | 1/1/1 | - | 1/1/1 | - | - |
| ***Czech Republic*** | 4/2/2 | 4/2/2 | 1/1/1 | 4/2/2 | 1/1/1 | 4/2/2 | 1/1/1 | 4/4/4 | 4/2/2 |
| ***Denmark*** | 4/2/2 | 4/1/1 | 1/1/1 | 1/1/1 | 1/1/1 | 2/2/2 | 1/1/1 | na | na |
| ***Germany*** | 3/2/2 | 2/2/2 | 1/1/1 | 1/1/1 | 1/1/1 | 3/2/2 (<750kg)<br>2/2/2 (>750kg) | 1/1/1 | 2/2/2<br>1/1/1 | 2/2/2 |
| ***Estonia*** | 3/2/2/2/1 | 1/1/1 | 1/1/1 | 1/1/1 | 1/1/1 | 3/2/2/2/1 | 1/1/1 | 2/1/1/1 | 3/2/2/2/1 |
| ***Ireland*** | 4/2/2 | 4/2/2 | 1/1/1 | 1/1/1 | 1/1/1 | 1/1/1 | na | na | na |
| ***Greece*** | 4/2/2 | 4/2/2 | 1/1/1 | na | 1/1/1 | na | na | na | na |
| ***Spain*** | 4/2/2/1 | 2(x3)/1(x4)/6m | 1(x10)/6m | 2/1/1/1/6m | 1(x5)/6m | 2(x3)/1(x4)/6m | 1(x10)/6m | 1(x10)/6m | 5/2/2 |
| ***France*** | 4/2/2 | 4/2/2 | 1/1/1 | 4/2/2 | - | - | - | - | - |
| ***Italy*** | 4/2/2 | 4/2/2 | 1/1/1 | 4/2/2 | 1/1/1 | 1/1/1 | 1/1/1 | - | 4/2/2 |
| ***Cyprus*** | 4/2/2 | - | 1/1/1 | - | 1/1/1 | - | 1/1/1 | - | - |
| ***Latvia*** | 2/2/2 | 1/1/1 | 6m/6m/6m | 6m/6m/6m | 1/1/1 | 1/1/1 | 1/1/1 | na | 1/1/1 |
| ***Lithuania*** | 3/2/2 | - | 1/1/1 | - | 1/1/1 | 3/2/2 | 1/1/1 | - | - |
| ***Luxembourg*** | 3.5/1/1 | 1/1/1 | 6m/6m/6m | 3.5/1/1 | 6m/6m/6m | 3.5/1/1 | 6m/6m/6m | 3.5/1/1 | 3.5/1/1 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Hungary*** | 4/3/2/2 | 2/2/1/1 | 1/1/1 | 3/3/2/2 | 1/1/1 | 2/2/1/1 | 1/1/1 | 3/3/2/2 | 3/3/2/2 |
| ***Malta*** | 1/1/1 | - | 1/1/1 | - | 1/1/1 | - | 1/1/1 | - | - |
| ***Netherlands*** | 4/2/2/1 | 3/1/1 | 1/1/1 | 1/1/1 | 1/1/1 | - | 1/1/1 | - | - |
| ***Austria*** | 3/2/1 | 1/1/1 | 1/1/1 | 1/1/1 | 1/1/1 | 3/2/1 | 1/1/1 | 3/2/1 | 1/1/1 |
| ***Poland*** | 3/2/1 | 3/2/1 | 1/1/1 | 1/1/1 | 1/1/1 | 3/2/1 | 1/1/1 | 3/2/2 | 3/2/1 |
| ***Portugal*** | 4/2/2/1 | 2/1/1 | 1(x7)/6m | 1(x7)/6m | 1(x7)/6m | na | 1(x7)/6m | 1(x7)/6m | na |
| ***Romania*** | 2/2/2 | - | 1/6m/6m | - | 1/1/1 | - | 1/1/1 | - | - |
| ***Slovenia*** | 3/2/2 | 3/1/1 | 1/1/1 | 3/1/1 | 1/1/1 | 3/1/1 | 1/1/1 | 3/1/1 | 3/1/1 |
| ***Slovakia*** | 3/1/1 | - | 1/1/1 | - | 1/1/1 | - | 1/1/1 | - | - |
| ***Finland*** | 3/2/1 | 3/1/1 | 1/1/1 | 1/1/1 | 1/1/1 | 2/2/2 | 1/1/1 | na | na |
| ***Sweden*** | 3/2/1 | 1/1/1 | 1/1/1 | 1/1/1 | 1/1/1 | 4/2/2 | 1/1/1 | na | 4/2/2 |
| ***United Kingdom*** | 3/1/1 | 3/1/1 | 1/1/1 | 1/1/1 | 1/1/1 | na | 1/1/1 | na | 3/1/1 |

Source: AUTOFORE Study on the Future Options for Roadworthiness in the European Union: WP540 – Analysis of pass/fail rates and accidents for different vehicle types in relation to PTI – frequency and vehicle age; DEKRA

## Annex 8: Yearly Vehicle Kilometres

| Item 1 | | Yearly vehicle kilometers (2008; category M1, vkm) | | | |
|---|---|---|---|---|---|
| Country | | <2y | 2-4y | 5-9y | >10y |
| Poland | Eurostat | 5719 | 7888 | 8151 | 8358 |
| | TREMOD/FLEETS/TREMOVE | 39830 | 37032 | 31924 | 22732 |
| Sweden | Eurostat | 14879 | 22607 | 14684 | 12906 |
| | TREMOD/FLEETS/TREMOVE | 13336 | 12966 | 11870 | 8748 |
| Norway | Eurostat | 17967 | 19032 | 16368 | 11495 |
| | TREMOD/FLEETS/TREMOVE | 9965 | 9750 | 8648 | 6151 |

Table 69 : Comparison yearly vehicle kilometers differentiated for vehicle age Mobility study Germany vs TREMOD/FLEETS/TREMOVE

| Items 1 | Yearly vehicle kilometers (2008) | | | | |
|---|---|---|---|---|---|
| Germany | | Diesel | | Gasoline | |
| Construction year | Vehicle age | Mobility study Germany | FLEETS/ TREMOVE | Mobility study Germany | FLEETS/ TREMOVE |
| 1990 | 19 | 16781 | 4440 | 9583 | 21185 |
| 1991 | 18 | 15454 | 5040 | 12879 | 22350 |
| 1992 | 17 | 13922 | 5699 | 9193 | 23554 |
| 1993 | 16 | 16721 | 6418 | 10833 | 24794 |
| 1994 | 15 | 16330 | 7197 | 10688 | 26067 |
| 1995 | 14 | 18832 | 8037 | 11577 | 27372 |
| 1996 | 13 | 15842 | 8936 | 11450 | 28703 |
| 1997 | 12 | 15992 | 9892 | 11180 | 30057 |
| 1998 | 11 | 19534 | 10899 | 12500 | 31430 |
| 1999 | 10 | 18333 | 11953 | 11417 | 32814 |
| 2000 | 9 | 18831 | 13046 | 11719 | 34205 |
| 2001 | 8 | 18423 | 14167 | 12515 | 35595 |
| 2002 | 7 | 19061 | 15304 | 11843 | 36977 |
| 2003 | 6 | 21241 | 16443 | 12421 | 38341 |
| 2004 | 5 | 20854 | 17567 | 11629 | 39678 |
| 2005 | 4 | 24359 | 18655 | 12687 | 40976 |
| 2006 | 3 | 26943 | 19685 | 12816 | 42221 |
| 2007 | 2 | 30650 | 20630 | 13585 | 43398 |
| 2008 | 1 | 27154 | 21458 | 13550 | 44485 |

## Annex 9: Vehicle categories

**Category M: Motor vehicles with at least four wheels designed and constructed for the carriage of passengers.**

- Category M1: Vehicles designed and constructed for the carriage of passengers and comprising no more than eight seats in addition to the driver's seat.
- Category M2: Vehicles designed and constructed for the carriage of passengers, comprising more than eight seats in addition to the driver's seat, and having a maximum mass not exceeding 5 tonnes.
- Category M3: Vehicles designed and constructed for the carriage of passengers, comprising more than eight seats in addition to the driver's seat, and having a maximum mass exceeding 5 tonnes.

**Category N: Motor vehicles with at least four wheels designed and constructed for the carriage of goods.**

- Category N1: Vehicles designed and constructed for the carriage of goods and having a maximum mass not exceeding 3,5 tonnes.
- Category N2: Vehicles designed and constructed for the carriage of goods and having a maximum mass exceeding 3,5 tonnes but not exceeding 12 tonnes.
- Category N3: Vehicles designed and constructed for the carriage of goods and having a maximum mass exceeding 12 tonnes.

**Category O: Trailers (including semi-trailers).**

- Category O1: Trailers with a maximum mass not exceeding 0,75 tonnes
- Category O2: Trailers with a maximum mass exceeding 0,75 tonnes but not exceeding 3,5 tonnes.
- Category O3: Trailers with a maximum mass exceeding 3,5 tonnes but not exceeding 10 tonnes.
- Category O4: Trailers with a maximum mass exceeding 10 tonnes.

**Category L :**

- Category L1: Mopeds
- Category L2: 3 and 4 wheel light Motorcycles
- Category L3: Motorcycles
- Category L4: Motorcycles with sidecar
- Category L5: Motortricycles
- Category L6: Light quadricycles
- Category L7: Heavy quadricycles

**Annex 10: Changes in the PTI legislation since 1977**

The first EU legislative act in this field is Council Directive 77/143/EEC on the approximation of the laws of the Member States relating to roadworthiness tests for motor vehicles and their trailers. Since then, EU legislation has been amended several times to reflect the increasing importance attributed to road safety, and also with a view to incorporating technological developments. The scope of this legislation in terms of vehicles to which it applies has also continually been broadened since then. Originally it only applied to commercial vehicles of more than 3.5 tons, taxis and ambulances, which were subject to testing once a year (1-1-1). As of 1988 the scope also includes light goods vehicles, with a test frequency 4-2-2, and as of 1991 also passenger cars, with a test frequency 4-2-2. In terms of technical content, the brake section was updated and the 'reasons for failure' were added in 1992. Then the exhaust emission testing was included and the brake performance and efficiency values were updated in line with type approval requirements. Some additional amendments have been made from 1999 to 2010, concerning emissions limits, the introduction of roadside inspections for trucks and new testing items, such as airbags, ABS, EBS. The current legislation on roadworthiness and on roadside testing is laid out in the following Directives: Commission Directive 2000/30/EC (Roadside technical checks) and Commission Directive 2009/40/EC (Roadworthiness directive); Commission Directive 2010/47/EU (amending Directive 2000/30/EC) and Commission Directive 2010/48/EU (amending Directive 2009/40/EC), Recommendation 2010/378/EU (Assessment of defects during roadworthiness testing), Recommendation 2010/379/EU (Risk assessment of deficiencies detected during technical roadside inspections of commercial vehicles).

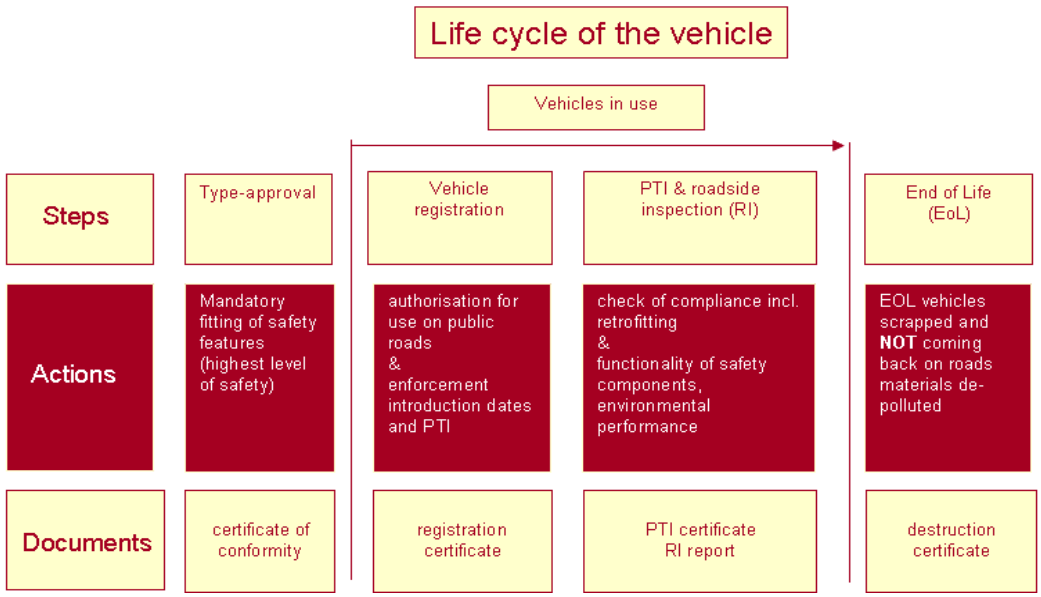
## Annex 11: Roadworthiness testing as a part of the vehicle regulatory scheme

Before a vehicle is allowed to be put on the market, it has to fulfil all the relevant type or individual approval requirements[166]. These are covered by more than 50 European legislative acts as well as more than 110 UN/ECE regulations guarantying an optimal level of safety and environmental standards. After passing the approval tests vehicle manufacturers are obliged to issue for each single vehicle that is put on the market a "Certificate of Conformity" (CoC), which contains its basic technical characteristics[167]. Every Member State has the obligation to register for the first time any vehicle that got the European type-approval on the basis of the CoC. The registration is the official authorisation for the use on public roads and enforces the different introduction dates of different vehicles' requirements.

Following the approval, cars in use have to undergo regularly PTI to check the compliance of the vehicles and its fulfilment of retrofitting requirements. Tests include also whether the safety and environmental performance is guaranteed. Commercial vehicles are additionally covered by the regime of technical roadside inspections by which their environmental and technical condition can be verified anytime and anywhere inside the EU.

During a vehicle's lifetime it may be subject to re-registration, due to a change of ownership, or a transfer to another Member State for permanent use[168]. When a vehicle is taken out of service and scrapped, a "Certificate of Destruction" – confirming the proper dismantling of parts and de-pollution of materials – has to be issued and registration authorities have to be informed thereof.[169]

*Figure 1: Roadworthiness testing as a part of the vehicle control regulatory scheme*




Source: DG MOVE

166 Directive 2007/46/EC on the framework for approval of vehicles and their trailers
Directive 2002/24/EC on the approval of powered two- or three-wheeled vehicles
Directive 2003/37/EC on the approval of agricultural tractors and their trailers

167 Regulation 1014/2010 on the content of CoC documents

168 Directive 1999/37/EC on the registration documents for vehicles

169 Directive 2000/53/EC on end of life vehicles

## Annex 12: Categories of vehicles which are particularly subject to too low PTI frequencies according to the provisions of Directive 2009/40/EC

### Passenger cars in business use

Mileage travelled is an important factor influencing the roadworthiness of vehicles. Inspection results show that the average rate of defects in the vehicles increases in relation to the yearly mileage, from about 14.8% of defects (including 4.4% of serious defects) up to 31.1% of defects (including 10.7% of serious defects) for the vehicles in the highest mileage class.[170] This is why taxis and ambulaces, which belong to the group of high mileage travelling cars (above 40,000 km/year), are inspected once per year, while other cars and vans are inspected every second year and only 4 years after initial registration for the first time.[171]

Passenger cars in business use (registered by companies) often belong to the group of vehicles with high mileage. In fact, the average mileage for such vehicles is over 68 thousand km/year, which is even more than for taxis (58 thousand km/year). However, this fact is not acknowledged in the legislation which does not set for passenger cars in business use a higher testing frequency.

Older vehicles

Statistics on the failure rate of vehicles at PTI have been analysed during the AUTOFORE study (see figure 2) showing that the number of vehicles not passing the test is strongly correlated with the vehicle's age.

In line with the results of PTI, statistics indicate that twice as many vehicles which are eight years or older are involved in accidents attributable to technical defects than newer vehicles. Even if the accident figures are compared on the basis of the distances travelled, older vehicles are involved in accidents twice as often as newer vehicles. Furthermore, older vehicles are responsible for fatal accidents disproportionately more often than newer vehicles.[172] Despite this evidence, Directive 2009/40/EC foresees the same, not increasing frequency of testing (every two years) for all the vehicles after a certain age (4 years for passenger cars, one year for commercial vehicles). Figure 3 presents in schematic manner the impact of age on the rate of vehicle deterioration and the benefits arising from more frequent testing of older vehicles.

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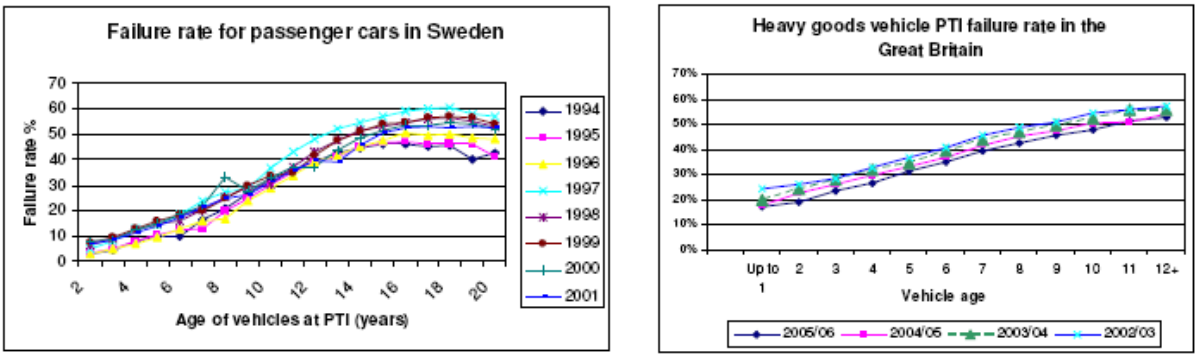
170 Europe Economics, op.cit.

171 Directive 2009/40/EC requires annual testing of taxis and ambulances

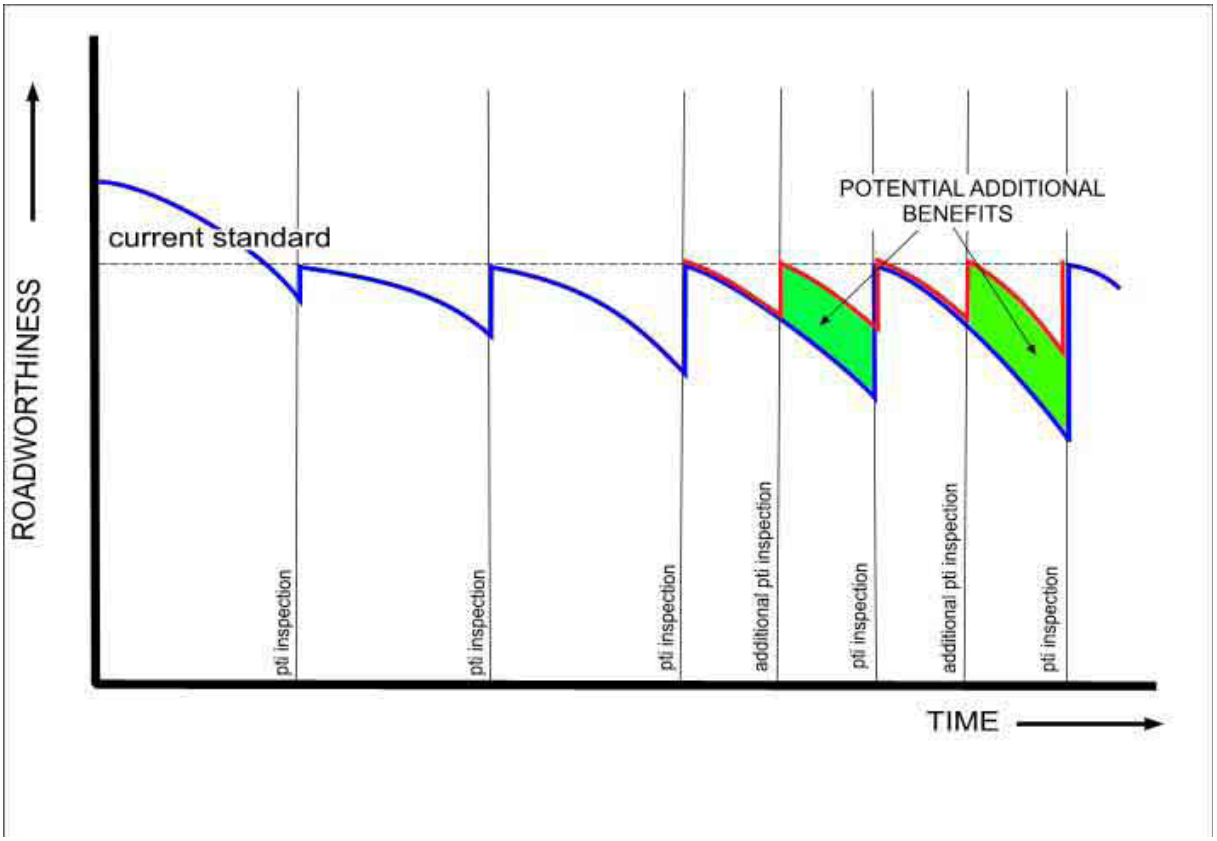
172 AUTOFORE (2007)

**Figure 2 Failure rates at PTI as a function of vehicle age**




Source: AUTOFORE

**Figure 3 Benefits of increasing PTI inspection frequency**




Source: AUTOFORE

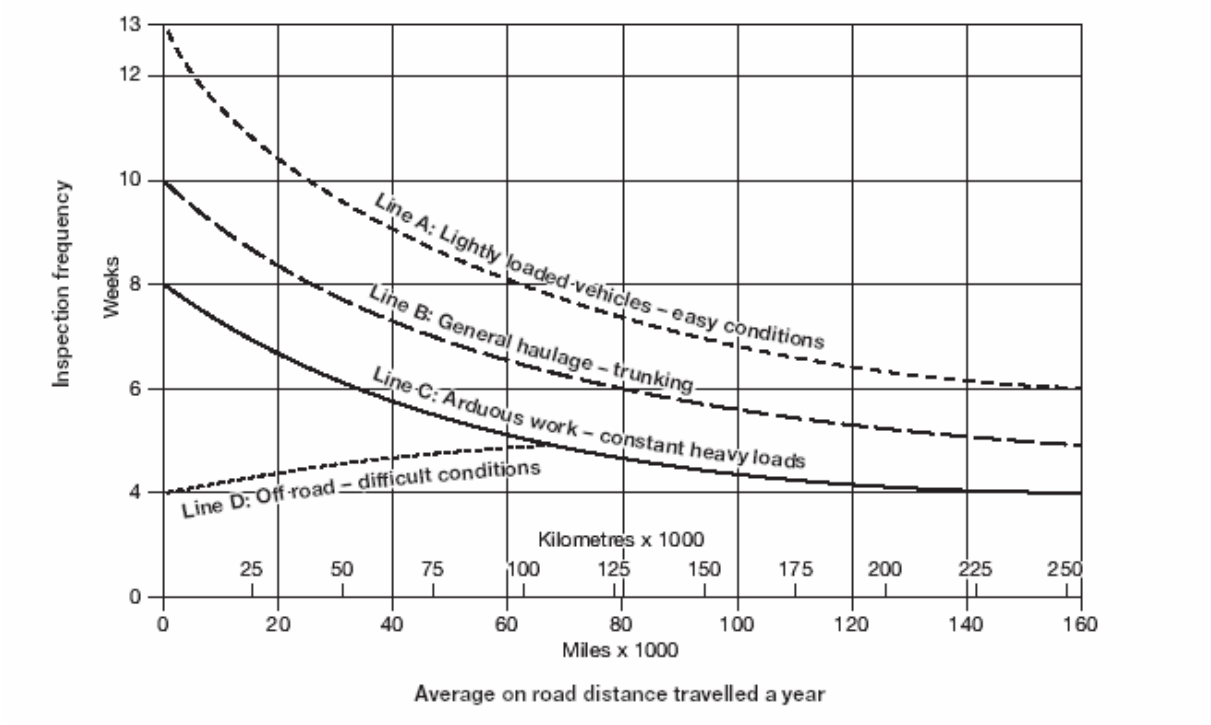
## Commercial vehicles

As indicated in the AUTOFORE study, it is well accepted that commercial vehicles deteriorate at higher rates than passenger vehicles due to their higher weight. In addition, many heavy vehicles travel between 50 and 200 thousand km/year, which is well above even the high mileages observed for taxis and ambulances.[173] The British Department of Transport provides

[173] AUTOFORE

guidance for the maintenance inspection intervals for such heavy vehicles, based on the expected time to failure (see figure 4 below). These intervals are similar to what is recommended by vehicle manufacturers.[174] While the recommended inspection frequency depends on the yearly mileage, it is never lower than once every 13 weeks, and can be as high as once every 4 weeks. Directive 2009/40/EC is far away from these standards, as it sets as minimum requirement to test heavy commercial vehicles once a year.

**Figure 4 Typical routine maintenance inspection intervals from the British Guide to Maintaining Roadworthiness**




Source: AUTOFORE

174 Ibid.

## Annex 13: Assumptions and methodologies used for calculating the benefits of policy options 2a-c

The methodology for estimating the benefits in terms of avoided accidents, fatalities and injuries, as well in terms of reduced air pollution, is based on two main sources:

- The AUTOFORE Study, Working Paper 700, which provides a methodology for calculating the impact of increasing the testing frequency.
- FITSA / Universidad Carlos III de Madrid / Applus Idiada, November 2008, "Estudio para la Incoperación del Diagnóstico Electrónico an las ITV".

The policy options presented in the impact assessment report contain each a number of individual measures. Below it is explained what methodology has been used for estimating the impacts of each type of measures.

### 1. Estimating the benefits of increased testing frequency

In the AUTOFORE Study, the following calculation formula has been elaborated by the University of Cologne (Prof. Dr. Schulz):

**Number of avoided accidents** = Acc * TD * RED * RAT * DefVeh,

Where:

– [Acc] is the number of accidents of vehicles in a given year;

– [TD] is the percentage share of accidents caused by technical defects (we assume 6% - see part. 0 of the main report for explanation);

– [RED] is an empirical derived reduction ratio for the percentage share of accidents (assumed to be equal to 0.6 in the AUTOFORE study);

– [RAT] is the ratio for number of additional inspections and number of inspections under the existing regime;

– [DefVeh] is the percentage share reflecting how many of all defect cars belong to the period with annual inspections

**It is important to mention that this methodology provides rather conservative estimates. For example, a study by the UK Department for Transport (DfT) of December 2008), "MOT Scheme Evidence-base"[175], estimated that moving back from the 3-1-1 frequency to 4-2-2 would result in an increase in the number of fatalities of 408. The above described model would estimate this same impact at a mere 48 additional fatalities.**

[175] http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/pgr/roads/vehicles/mot/mot/

The CARE database[176] provides estimations of the number of fatalities, serious and slight injuries per accident. The Handbook on estimation of external costs in the transport sector[177] provides estimated monetized costs of fatalities, serious and slight injuries:

| | *Costs per unit in €* |
|---|---|
| ***Saved life*** | 1 500 000 |
| ***Avoided serious injury*** | 195 000 |
| ***Avoided slight injury*** | 15 000 |

These two sources allow the translation of the number of avoided accidents in monetary terms.

The following table provides, as an example, the calculation of the impact of moving from the current testing frequency of 4-2-2 to 3-2-1 in France:

| *Acc* | *TD* | *RED* | *RAT* | *DefVeh* | *Reduced Acc* |
|---|---|---|---|---|---|
| **74487** | 5,8% | 0.6 | 0,86667 | 1,000065 | 2286 |

This number of avoided accidents then translates into the following number of fatalities and injuries:

| *Reduced Acc* | *Fatalities rate* | *Saved lives* | *Severe injuries rate* | *Avoided severe injuries* | *Slight injuries rate* | *Avoided slight injuries* |
|---|---|---|---|---|---|---|
| **2286** | 0.0296 | 68 | 0.4694 | 1073 | 0.7898 | 1806 |

Using the estimations of the monetary value of fatalities and injuries, we can estimate the monetised benefit of increasing the testing frequency of cars in France at € 338.3 million.

2. Estimating the benefits of testing the electronic safety components (airbag and ESC)

The electronic safety components are crucial for reducing the severity of accidents and their consequences. Their impact in terms of life saving is therefore proportionately much higher than their potential to reduce the number of accidents. For facility, we therefore decided to estimate only the impact in terms of reduced number of fatalities – omitting the benefits related to the lower number of accidents – while being conscious of the fact that it provides saving estimations which are lower than in reality.

ESC

The following equation was used to estimate the number of lives saved with the testing of ESC during PTI:

**Number of fatalities avoided** = POT * DEF * RED,

176 http://ec.europa.eu/transport/road_safety/specialist/statistics/care_reports_graphics/index_en.htm.

177 Handbook on estimation of external costs in the transport sector (2008), op.cit.

Where:

– [POT] is the overall life-saving potential of ESC for the whole European fleet (estimated at 2 250 by the "Cost-benefit assessment and prioritisation of vehicle safety technologies" study[178];

– [DEF] is the defect rate of ESC. IDELSY estimates this rate at 17%, taking into account all the defects of the ESC, some of which can only be detected with advanced tools introduced by option 2b.[179] AUTOFORE only deals with the defects which are stored in the control unit, which can be detected with simple OBD testing introduced by option 2a, and comes with a lower figure of 7%;

– [RED] is the ratio of detection of inspected defects during PTI. For ESC, it has been estimated at 80% by AUTOFORE.

The above methodology leads us to the estimates of the life-saving potential of ESC inspections in options 2a and 2b:

– In 2a, it is: 2 250 * 0.07 * 0.8 = 126 lives

– In 2b, it is: 2 250 * 0.17 * 0.8 = 306 lives

Airbags

According to the FITSA study, 0.5% of all fatalities could be avoided if airbags were better inspected. With a total number of fatalities of 35 000 in the EU[180], 175 lives could be saved if airbags were included in the PTI. As no more precise estimations are available, we assume the same potential for the testing as introduced by options 2a and 2b.

3. Estimating the benefits of better implementation

As a main element of better implementation the raising of awareness by communication campaigns has been identified. As a result of the meta-analysis carried out in the CAST study[181] a reduction of 9% of accidents levels may be achieved by such campaigns.

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178 COWI (2006), Cost-benefit assessment and prioritisation of vehicle safety technologies.

179 Related to the functionality testing of electronic safety components today, only a few pilots are in place in Europe. Examples of the benefits of a functionality testing have been presented by FSD (Fahrzeug System Daten GmbH, Germany) where i.a. in case of ESC a wrong mounting of the yaw rate sensor (mounted 180° rotated) after a repair of the audio system in the car has been detected. This kind of wrong mounting would result in an additional destabilisation of the car in case of an activation of the ESC ending up in supporting the accident! Furthermore from practical experience by the different testing organisations and by CITA the interface between electronic and mechanic parts – called activators - are those with the highest defect rates of such systems. Such activators cannot be checked by electronic means and therefore testing of the functionality is important.

180 CARE, DG MOVE.

181 A theoretical approach to assess road safety campaigns (CAST 2009).

Assuming that the effect of campaigns will become effective in countries at lower quality level of PTI the number of fatalities reported there is about 7,605. With 6% of these fatalities linked to technical defects about 456 fatalities have to be considered. The potential of a reduction by 9% results in the range of saving of 41 lives. This would lead to a reduction by 1,885 accidents ending up in 41 lives saved and 6,930 serious and 38,498 slight injuries avoided.

Emissions: CO2 saving; reduction of toxic local emissions

To derive the quantities of $NO_x$-, HC- and CO-emissions, we use emission factors provided in the AUTOFORE study. The emission factor for $NO_x$ is 0.0845 g per km, for HC the emission factor has the value 0.0663 g per km, and the emission factor for CO is 0.9808 g per km. The reduction which is achievable with an annual inspection of older cars with petrol engines is a lowering of 6% in $NO_x$-emissions, 12% lowering in HC-emissions and 13% lowering in CO-emissions.

The HC and CO-emissions can be transformed into $NO_x$-units. The toxicity factor for HC is 1.5 and for CO the toxicity factor is 0.003.

Using the AUTOFORE model, DG MOVE calculated for all Member States the environmental benefits from the annual testing for vehicles older than eight years due to a reduction in local toxic emissions from petrol powered cars. The following table provides the example calculation for PO 2b.

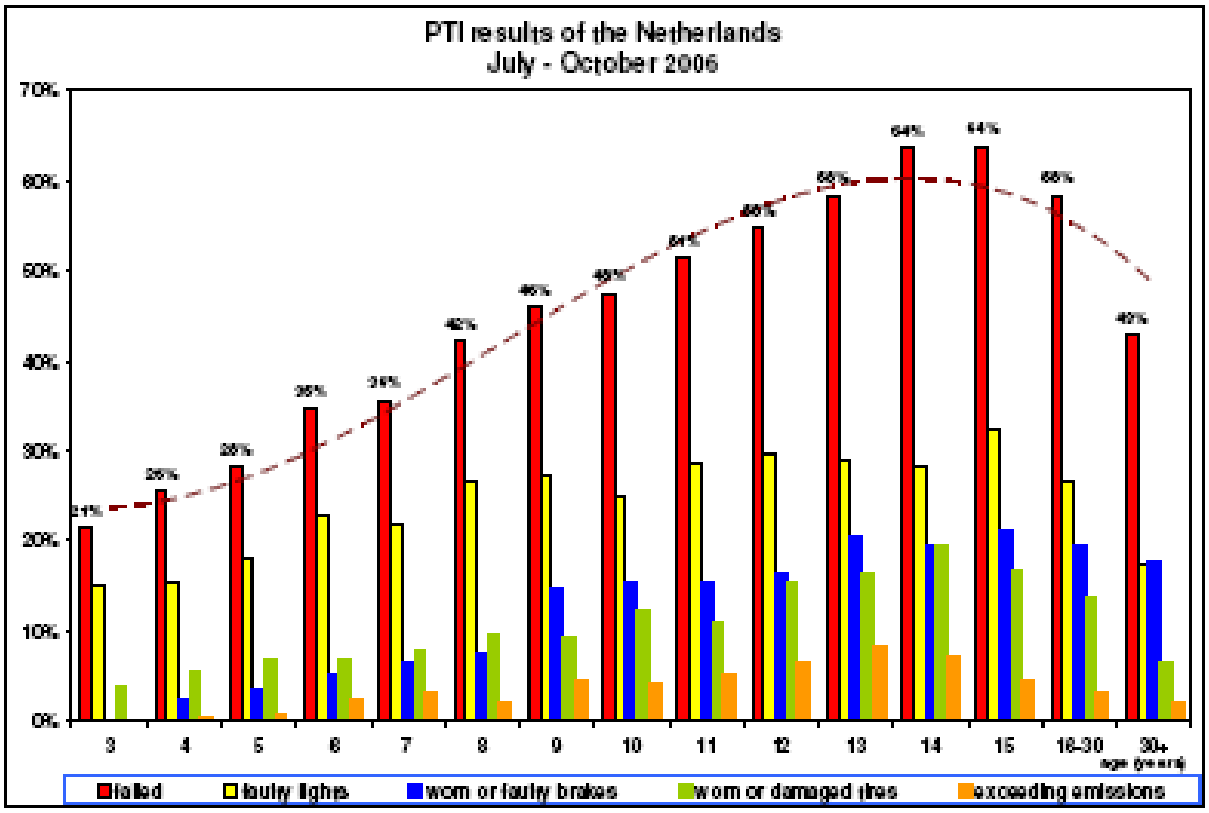
| *Relevant Member States* | *Number of additional Inspected Passenger Cars* | *Share of Petrol Cars [%]* | *Reduction of Emissions in Tons* | | | |
|---|---|---|---|---|---|---|
| | | | NOx | HC | CO | NOx-Equivalent |
| ***BELGIUM*** | 0 | 42% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***DENMARK*** | 879.565 | 90% | 80,3 | 126,0 | 2.018,5 | 275,2 |
| ***GERMANY*** | 10.813.765 | 74% | 658,4 | 1.033,3 | 16.558,8 | 2.258,0 |
| ***GREECE*** | 1.356.971 | 70% | 60,5 | 95,0 | 1.522,4 | 207,6 |
| ***SPAIN*** | 2.002.059 | 51% | 131,9 | 207,1 | 3.318,2 | 452,5 |
| ***FRANCE*** | 5.452.353 | 46% | 359,3 | 563,9 | 9.036,6 | 1.232,2 |
| ***IRELAND*** | 652.447 | 80% | 43,0 | 67,5 | 1.082,5 | 147,6 |
| ***ITALY*** | 8.411.841 | 60% | 511,7 | 803,0 | 12.869,2 | 1.754,8 |
| ***LUXEMBOURGH*** | 0 | 40% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***NETHERLANDS*** | 0 | 80% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***AUSTRIA*** | 0 | 46% | 0,0 | 0,0 | 0,0 | 0,0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| ***PORTUGAL*** | 433.059 | 50% | 26,3 | 41,3 | 662,5 | 90,3 |
| ***FINLAND*** | 0 | 83% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***SWEDEN*** | 0 | 90% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***UK(GB)*** | 0 | 74% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***CYPRUS*** | 154.088 | 91% | 6,9 | 10,8 | 173,1 | 23,6 |
| ***CZECH REPUBLIC*** | 1.303.824 | 77% | 58,2 | 91,3 | 1.462,8 | 199,5 |
| ***ESTONIA*** | 49.824 | 77% | 1,9 | 3,0 | 47,6 | 6,5 |
| ***HUNGARY*** | 1.022.029 | 81% | 45,6 | 71,5 | 1.146,6 | 156,4 |
| ***LATVIA*** | 0 | 76% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***LITHUANIA*** | 405.479 | 75% | 14,9 | 0,0 | 375,0 | 16,0 |
| ***MALTA*** | 65.696 | 71% | 2,7 | 4,2 | 67,0 | 9,1 |
| ***POLAND*** | 0 | 66% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***SLOVAK REPUBLIC*** | 0 | 70% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***SLOVENIA*** | 42.960 | 70% | 1,9 | 3,0 | 48,2 | 6,6 |
| ***BULGARIA*** | 0 | 70% | 0,0 | 0,0 | 0,0 | 0,0 |
| ***ROMANIA*** | 938.559 | 72% | 41,9 | 65,7 | 1.053,0 | 143,6 |
| **TOTAL** | **33.984.517** | | **2045,4** | **2.074,9** | **33.252,7** | **6.979,5** |

Source: Based on: Autofore (2007),op.cit.

Savings of $CO_2$ have been calculated as proportional to the reduction in fuel consumption, considering the fuel savings resulting from more frequent inspections. According to AUTOFORE, a reduction of 2% of $CO_2$ emissions is achievable. This results in a saving of 342.5 kg of $CO_2$ per vehicle inspection.

The below data for the Netherlands on the number of defects related to emissions for vehicles of different ages shows that the potential for reducing $CO_2$ emissions with more frequent inspections of younger cars (aged 3 years or less) is very small. This fact has been taken into consideration for calculations on the $CO_2$ savings for options with an annual test for all vehicles by assuming only a 2.2% emission reduction potential.




Source: AUTOFORE

4. Estimating the benefits in terms of reduced congestion resulting from the smaller number of accidents

Indirect benefits for the society include the reduced amount of congestion due to accidents. AUTOFORE estimations for congestion costs resulting from an accident range from € 5,000 to € 15,000. In this report, we used the more conservative value of € 5,000.

5. Estimation of additional staff needed for PTI

The time for testing of a car is 25 minutes.[182] We assume that an inspector works 8 hours a day and therefore completes 20 inspections per day. The average number of working days per year being 220, one inspector can complete 4,400 inspections per year. In order to estimate the number of additional staff needed under each policy option, we simply divide the additional number of tests by 4,400.

6. Estimation of additional staff costs for RSI

It is assumed that a RSI of a commercial vehicle in average takes 20 minutes.[183] Therefore, in order to estimate the cost of additional RSI, we multiply the number of such inspections by the average hourly wage of a technician (according to the Standard Cost Model) divided by 3. The number of additional inspections is estimated on the basis of the table below.

182 'MOT scheme evidence base', op.cit.

183 DG MOVE estimations.

**Table: Cost of additional staff for more RSI – describe methodology, using the table**

| *Reporting Member State* | *RSI performed* | *registered HDV* | *10% RSI* | *15% RSI* | *difference to 10%* | *difference to 15%* | *labour cost per h ** | *10% RSI* | *15% RSI* | *costs today* |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Austria*** | **13.360** | 362990 | 36.299 | 54.449 | 22.939 | 41.089 | 11,84 | 90502 | 162108 | 52.710 |
| ***Belgium*** | **19.265** | 662780 | 66.278 | 99.417 | 47.013 | 80.152 | 9,45 | 148093 | 252483 | 60.686 |
| ***Bulgaria*** | **472.324** | 273570 | 27.357 | 41.036 | -444.967 | -431.289 | 1,03 | 0 | 0 | 162.322 |
| ***Cyprus*** | **919** | 119795 | 11.980 | 17.969 | 11.061 | 17.050 | 8,51 | 31368 | 48355 | 2.606 |
| ***Czech Republic*** | **106.470** | 589598 | 58.960 | 88.440 | -47.510 | -18.030 | 3,00 | 0 | 0 | 106.534 |
| ***Germany*** | **2.833.493** | 2346678 | 234.668 | 352.002 | -2.598.825 | -2.481.491 | 14,04 | 0 | 0 | 13.256.060 |
| ***Denmark*** | **265** | 34629 | 3.463 | 5.194 | 3.198 | 4.929 | 22,99 | 24507 | 37777 | 2.031 |
| ***Estonia*** | **2.236** | 75317 | 7.532 | 11.298 | 5.296 | 9.062 | 2,62 | 4624 | 7912 | 1.952 |
| ***Finland*** | **14.198** | 424498 | 42.450 | 63.675 | 28.252 | 49.477 | 14,63 | 137745 | 241229 | 69.224 |
| ***France*** | **1.669.391** | *5569683* | 556.968 | 835.452 | -1.112.423 | -833.939 | 12,86 | 0 | 0 | 7.158.243 |
| ***Greece*** | **24.431** | *1180000* | 118.000 | 177.000 | 93.569 | 152.569 | 8,02 | 250188 | 407944 | 65.324 |
| ***Hungary*** | **351.690** | *419416* | 41.942 | 62.912 | -309.748 | -288.778 | 2,80 | 0 | 0 | 327.674 |
| ***Ireland*** | **5.204** | *345874* | 34.587 | 51.881 | 29.383 | 46.677 | 18,50 | 181177 | 287810 | 32.088 |
| ***Italy*** | **13.863** | *4437638* | 443.764 | 665.646 | 429.901 | 651.783 | 9,49 | 1359707 | 2061484 | 43.846 |
| ***Lithuania*** | ***31.197*** | 128733 | 12.873 | 19.310 | -18.324 | -11.887 | 2,28 | 0 | 0 | 23.724 |
| ***Luxembourg*** | **896** | 28571 | 2.857 | 4.286 | 1.961 | 3.390 | 14,88 | 9729 | 16816 | 4.445 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Latvia*** | **9.441** | 113978 | 11.398 | 17.097 | 1.957 | 7.656 | 2,29 | 1494 | 5847 | 7.210 |
| ***Malta*** | **3.579** | *44402* | 4.440 | 6.660 | 861 | 3.081 | 6,07 | 1742 | 6231 | 7.238 |
| ***Netherlands*** | **4.147** | 951282 | 95.128 | 142.692 | 90.981 | 138.545 | 14,36 | 435345 | 662939 | 19.843 |
| ***Poland*** | **1.328.828** | 2511677 | 251.168 | 376.752 | -1.077.660 | -952.076 | 3,07 | 0 | 0 | 1.358.507 |
| ***Portugal*** | **558** | *1350000* | 135.000 | 202.500 | 134.442 | 201.942 | 4,16 | 186337 | 279892 | 773 |
| ***Romania*** | **43.700** | 612179 | 61.218 | 91.827 | 17.518 | 48.127 | 2,03 | 11882 | 32643 | 29.640 |
| ***Sweden*** | **165.263** | 502036 | 50.204 | 75.305 | -115.059 | -89.958 | 14,90 | 0 | 0 | 820.926 |
| ***Slovenia*** | **4.026** | 74238 | 7.424 | 11.136 | 3.398 | 7.110 | 5,27 | 5968 | 12487 | 7.071 |
| ***Slovakia*** | **5.637** | 246893 | 24.689 | 37.034 | 19.052 | 31.397 | 2,41 | 15327 | 25258 | 4.535 |
| ***United Kingdom*** | **165.927** | 3652061 | 365.206 | 547.809 | 199.279 | 381.882 | 17,67 | 1173658 | 2249103 | 977.231 |
| ***Spain*** | **0** | 5192219 | 519.222 | 778.833 | 519.222 | 778.833 | 8,06 | 1395495 | 2093243 | 0 |
| ***Total*** | **7.259.111** | | **3.225.074** | 4.837.610 | | | | **5.464.889** | **8.891.560** | **24.602.444** |

*_standard cost model

**Annex 13a**

| | | | | | Total employed time lost for PTI (min)* | | | time cost per capita, per MOT (€) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **COUNTRY** | **National Average Per Capita Income using PPP method (€)**** | **Average working minutes per Year** | **Average Income per minute worked (€/min)** | **PTI Price in 2004 (€)** | **Low** | **Medium** | **High** | **Low** | **Medium** | **High** |
| BELGIUM | 21100 | 345600 | 0,0611 | 24,5 | 36,4 | 55,4 | 79,3 | 2,22 | 3,38 | 4,84 |
| DENMARK | 18800 | 345600 | 0,0544 | 53,8 | 36,4 | 55,4 | 79,3 | 1,98 | 3,01 | 4,31 |
| GERMANY | 22700 | 345600 | 0,0657 | 40 | 36,4 | 55,4 | 79,3 | 2,39 | 3,64 | 5,21 |
| GREECE | 18200 | 345600 | 0,0527 | 36 | 36,4 | 55,4 | 79,3 | 1,92 | 2,92 | 4,18 |
| SPAIN | 19100 | 345600 | 0,0553 | 31 | 36,4 | 55,4 | 79,3 | 2,01 | 3,06 | 4,38 |
| FRANCE | 22100 | 345600 | 0,0639 | 55 | 36,4 | 55,4 | 79,3 | 2,33 | 3,54 | 5,07 |
| IRELAND | 19700 | 345600 | 0,0570 | 48,4 | 36,4 | 55,4 | 79,3 | 2,07 | 3,16 | 4,52 |
| ITALY | 19400 | 345600 | 0,0561 | 35 | 36,4 | 55,4 | 79,3 | 2,04 | 3,11 | 4,45 |
| LUXEMBOURG | 38901 | 345600 | 0,1126 | 20,9 | 36,4 | 55,4 | 79,3 | 4,10 | 6,24 | 8,93 |
| NETHERLANDS | 20900 | 345600 | 0,0605 | 20,9 | 36,4 | 55,4 | 79,3 | 2,20 | 3,35 | 4,80 |
| AUSTRIA | 22200 | 345600 | 0,0642 | 37 | 36,4 | 55,4 | 79,3 | 2,34 | 3,56 | 5,09 |
| PORTUGAL | 15600 | 345600 | 0,0451 | 24,63 | 36,4 | 55,4 | 79,3 | 1,64 | 2,50 | 3,58 |
| FINLAND | 20200 | 345600 | 0,0584 | 49 | 36,4 | 55,4 | 79,3 | 2,13 | 3,24 | 4,64 |
| SWEDEN | 20800 | 345600 | 0,0602 | 33 | 36,4 | 55,4 | 79,3 | 2,19 | 3,33 | 4,77 |
| UK(GB) | 21800 | 345600 | 0,0631 | 52,49 | 36,4 | 55,4 | 79,3 | 2,30 | 3,49 | 5,00 |
| CYPRUS | 19000 | 345600 | 0,0550 | 36 | 36,4 | 55,4 | 79,3 | 2,00 | 3,05 | 4,36 |
| CZECH REPUBLIC | 13300 | 345600 | 0,0385 | 50 | 36,4 | 55,4 | 79,3 | 1,40 | 2,13 | 3,05 |
| ESTONIA | 10600 | 345600 | 0,0307 | 30 | 36,4 | 55,4 | 79,3 | 1,12 | 1,70 | 2,43 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| HUNGARY | 11000 | 345600 | 0,0318 | 20,18 | 36,4 | 55,4 | 79,3 | 1,16 | 1,76 | 2,52 |
| LATVIA | 9100 | 345600 | 0,0263 | 35 | 36,4 | 55,4 | 79,3 | 0,96 | 1,46 | 2,09 |
| LITHUANIA | 11400 | 345600 | 0,0330 | 35 | 36,4 | 55,4 | 79,3 | 1,20 | 1,83 | 2,62 |
| MALTA | 12772 | 345600 | 0,0370 | 36 | 36,4 | 55,4 | 79,3 | 1,35 | 2,05 | 2,93 |
| POLAND | 11500 | 345600 | 0,0333 | 21,29 | 36,4 | 55,4 | 79,3 | 1,21 | 1,84 | 2,64 |
| SLOVAK REPUBLIC | 13000 | 345600 | 0,0376 | 35 | 36,4 | 55,4 | 79,3 | 1,37 | 2,08 | 2,98 |
| SLOVENIA | 16000 | 345600 | 0,0463 | 35 | 36,4 | 55,4 | 79,3 | 1,69 | 2,56 | 3,67 |
| ROMANIA | 8500 | 345600 | 0,0246 | 35 | 36,4 | 55,4 | 79,3 | 0,90 | 1,36 | 1,95 |
| BULGARIA | 5600 | 345600 | 0,0162 | 35 | 36,4 | 55,4 | 79,3 | 0,59 | 0,90 | 1,28 |
| | **average time costs per citizen:** | | | | | | | **1,81** | **2,75** | **3,94** |

*Europe Economics, UK-MOT Scheme Evidence Base

** EUROSTAT

*TABLE: MAIN RESULTS OF BENEFIT CALCULATIONS:*

| | | OPTION A | | | **OPTION B** | | | OPTION C | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | LIVES SAVED | INJURIES AVOIDED | | LIVES SAVED | INJURIES AVOIDED | | LIVES SAVED | INJURIES AVOIDED | |
| MEASURES | | | SEVERE | SLIGHT | | SEVERE | SLIGHT | | SEVERE | SLIGHT |
| TESTING ITEMS | ESC | 158 | | | 158 | | | 158 | | |
| | AIRBAG | 175 | | | 175 | | | 175 | | |
| | SHOCK-ABSORBER | 181 | 403 | 2079 | 181 | 403 | 2079 | 181 | 403 | 2079 |
| | ENHANCED HDV BRAKE TEST | | | | 70 | 1293 | 17361 | 70 | 1293 | 17361 |
| CATEGORY & FREQUENCY OF TESTING | CARS 3-2-2 | 15 | 183 | 1019 | | | | | | |
| | CARS 3-2-1 | | | | 289 | 5337 | 21910 | | | |
| | CARS 1-1-1 | | | | | | | 320 | 5944 | 24486 |
| | PTW 3-2-2 | 220 | 1275 | 2947 | | | | | | |
| | PTW 3-1-1 | | | | 279 | 3585 | 7086 | | | |
| | PTW 1-1-1 | | | | | | | 352 | 4523 | 8941 |
| | MOPED 3-1-1 | | | | 89 | 1142 | 3134 | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | MOPED 1-1-1 | | | | | | | 173 | 2336 | 6509 |
| | HDV 0,5-0,5-0,5 | | | | | | | 12 | 222 | 2976 |
| | | | | | | | | | | |
| TOTAL | | 749 | 1861 | 6045 | **1241** | **11760** | **51570** | 1441 | 14721 | 62352 |

| | | | |
|---|---|---|---|
| BENEFIT TO SOCIETY [MILLION €] | 1577 | **4928** | 5967 |

| | | | |
|---|---|---|---|
| REDUCTION OF ACCIDENTS | 7391 | **36562** | 60162 |

| | | | |
|---|---|---|---|
| REDUCTION OF CONGESTION [MILLION €] | 16.6 | **119.3** | 199.8 |

| | | | | |
|---|---|---|---|---|
| $CO_2$ EMISSION SAVING | [MILLION TON] | 0.9 | **18.2** | 19.9 |
| | [MILLION €] | 27.9 | **545.0** | 599.0 |

| | | | | |
|---|---|---|---|---|
| $NO_X$ EQUIVALENT SAVING | [TON] | 308.2 | **6979.5** | 12224 |

| | | | | |
|---|---|---|---|---|
| | [MILLION €] | 1.4 | **30.7** | 53.8 |

**Cost Benefit – Roadside Inspections**

Cost Benefit ratio related to road safety and reduction of administrative burden.

| *Cost (€ million)* | *Monetized benefit (€ million)* | *Monetized benefit/cost ratio* | *Other benefits* |
|---|---|---|---|
| **36** | **812.5** | **22.7:1** | Avoid unnecessary testing of 2.3 Mio trucks due to targeted selection<br><br>**€ 80.4 Mio** |

Benefit of proposed changes:

| *Area* | *Issue* | *Description* | *Estimated Benefit* |
|---|---|---|---|
| ***10% of registered HDV to be tested*** | Targeted vehicle selection | The change from a pour random vehicle selection with a detection rate of ~ 1% of defect vehicles the targeted approach leads to a detection rate of ~40% of defect vehicles. This leads to up to a reduction of 2.3 Mio trucks tested without defects detected.<br><br>Total number of tests would not change | Reduction of administrative burden:<br><br>- for transport operators<br><br>€ 80.4 Mio<br><br>- for national administrations<br><br>No impact |
| | More elaborated tests with mobile inspection units | 15% of the pre-selected vehicles would be subject to a more elaborated test on a mobile inspection unit. It can be estimated that ~ 20 % of these tests result in detection of dangerous defects avoiding more than 2300 accidents | 205 lives saved<br><br>672 serious injuries avoided<br><br>24936 slight injuries avoided<br><br>€ 812.5 Mio |
| ***Total benefit road safety*** | | | **€ 812.5 Mio** |
| ***Total benefit reduction of administrative burden*** | | | **€ 80.4 Mio** |

Cost of proposed changes:

| *Yearly Costs (€ million) for Member States* | *Total* |
|---|---|
| Perform more elaborated tests with mobile inspection units | 36 |
| **Total** | **36** |

**Cost Benefit – Vehicle Administrative Plattform**

Cost Benefit ratio related to road safety and reduction of administrative burden.

| *Cost (€ million)* | *Monetized benefit (€ million)* | *Monetized benefit/cost ratio* | *Other benefits* |
|---|---|---|---|
| **8** | **536.5** | **67:1** | 2nd hand car market and re-registration<br>**€ 2,979 Mio - € 4,733 Mio** |

Purpose areas of the Vehicle Administrative Platform and estimated benefits:

| *Area* | *Issue* | *Description* | *Estimated Benefit* |
|---|---|---|---|
| ***Inspection*** | Certificate of Conformity (CoC) Data + technical information | For assessing the compliance of a vehicle with its technical composition at the time when it was put on the market, the information based on the CoC data (e.g. approved dimension of tyres, number of seats) as well as additional technical information for each single vehicle (e.g. secondary braking system, suspension system) is needed.<br><br>One single harmonised set of data will replace 27 different information requests. | Reduction of administrative burden:<br><br>- for vehicle manufacturers<br><br>€ 18 Mio[184]<br><br>- for national administrations<br><br>€ 20 Mio |
| | ABS / ESC | For an enhanced testing of ABS or ESC communication has to set up between the testing equipment (OBD-connector) and the on board control unit of these systems to trigger the actuators (interface between pure electronic system and the mechanic/hydraulic system) e.g. to apply certain brake force to a certain wheel. | 158 lives saved<br><br>€ 237 Mio |
| | Airbag | Set up communication between the testing equipment (OBD-connector) and the on board unit of the airbag(s) to check their presence and to read out fault codes | 175 lives saved<br><br>€ 262.5 Mio |
| ***Market*** | Odometer fraud and second hand vehicles market | Mileage fraud[185] is for national transactions in the range of 5% to 12% and at cross border transactions at a range of 30% to 50%. In the case of Germany these values would lead to a monetary effect in the range of €725 Mio to €1.357 Mio per year. The scale of the problem was confirmed by different other presentations from UK, CZ, HU and FR. Extrapolating the quoted figures for EU 27 the monetary effect would be in the range of €4.030 | Estimation that 50% of odometer fraud might be reduced: |

184 Source: ACEA

185 The economical impact of mileage fraud and the cost benefit analysis of the Car-Pass system

| | | | |
|---|---|---|---|
| | | Mio to €7.539 Mio. | €2.015 Mio to € 3.769 Mio |
| | Re-registration | Data for vehicle registration are derived from the Certificate of Conformity (CoC) document which is generally only available at first registration. Re-registration is done with the information contained in the registration document of the previous registration. If data is missing - as the amount of mandatory data on registration documents is minimised – such data has to be retrieved from the vehicle manufacturer. | Reduction of administrative burden at re-registration[186]<br>€ 964 Mio |
| ***Estimated benefit related to road safety*** | | | **€ 499.5 Mio** |
| ***Estimated benefit related to reduction of administrative burden*** | | | **€ 38 Mio** |
| ***Estimated benefit related to single market issues*** | | | **€ 2,979 Mio - € 4,733 Mio** |
| **Estimated total benefits** | | | **€ 3,516.5 Mio - € 5,266.5 Mio** |

Cost of setting up the data exchange system[187]

| *Yearly Costs (€ million)* | *Member States* | *EU* | *Total* |
|---|---|---|---|
| ***One-off (5-year amortisation assumed)*** | 4.3 | 0.6 | 4.9 |
| ***Maintenance*** | 2.5 | 0.4 | 2.9 |
| ***Management*** | 0.3 | 0.04 | 0.3 |
| **Total** | 7.0 | 1.0 | **8.0** |

Source: Commission calculations using cost estimates in Europe Economics, *op. cit.*, pp. 173-176.

186 Draft Impact Assessment on registration of motorvehicles (Agenda Planning 2011/ENTR/010)

187 Data used for the calculation of these costs can be found in Europe Economics, *op. cit.*, p. 173-176.

**Annex 14: Europe Economics, final report, February 2011, Report of contribution to impact assessment of policy options to improve the EU system of PTI and of roadside vehicle testing**

Attached as separate document.