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Accompanying document to the

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
on the retrofitting of mirrors to heavy goods vehicles registered in the Community

Full Impact Assessment

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EXECUTIVE SUMMARY

Every year, about 400 European road users lose their lives in accidents with trucks, because the truck driver did not see them, when he or she turned right.

Under a EU-Directive of 2003, new trucks (heavy goods vehicles with a total weight of more than 3.5 tons) will have to be equipped with blind spot mirrors from next year on.

However, the replacement of trucks in Europe is slow. The existing population of heavy good vehicles, today at around 5 million in the European Union, will only be fully replaced in around 16 years, i.e. by 2023. Until then, the danger will continue to exist, even with existing legislation.

If a legal retrofitting obligation enters into force by 2008 for the relevant heavy goods vehicle population in operation since 1998, an extra 1,200 lives on European roads can be saved until 2020.

The retrofit concerns almost 4 Million heavy goods vehicles. For the overwhelming majority of this population, costs of retrofit will be between 100 and 150 EUR per truck, i.e. less than the cost of one stop at the petrol station.

If implemented (by 2008), the benefit-cost ratio of the measure is in the order of 3.5:1; for each Euro invested, there is a benefit of 3.5 Euros. In total figures, the benefits are estimated to be around 1.7 billion EUR, while the costs would amount to between 400 and 600 million EUR.

The retrofitting obligation is based on a cost-benefit driven approach. Whereas the proposal takes into account the requirements of Directive 2003/97/EC, it provides for a certain degree of flexibility and limits the scope in comparison to the directive for new vehicles.

The alternative options considered are: no policy change and rigid application of the requirements for lateral mirrors on new trucks of directive 2003/97/EC. Frontal mirrors and retrofitting buses, coaches and light goods vehicles were not considered to be viable options due to the fact that the benefits would not outweigh the costs of these measures.

1. STAKEHOLDER CONSULTATION

External expertise was used in two procedures. In 2004, the Commission services commissioned a cost-benefit study on blind spot mirrors. During this study, a number of stakeholders had already been contacted. This cost-benefit analysis is used as a basis of the Commission proposal.

Furthermore, a public and open stakeholder consultation took place between 12 April and 19 May 2006. The normal period of 2 months was reduced since numerous stakeholders had already been contacted during the study in 2004. 38 replies were received; this includes replies which were received after the official end of the consultation:

- 10 of these replies come from manufacturers of vehicle equipment with mirrors or other devices to improve the field of indirect vision;
- 8 come from road safety organisations, including one Member of the European Parliament
- 7 from national and international haulage associations (DE, DK, NL, BE, ES, UK, IRU)
- 8 from national or regional governments (CY, DE, EL, MT, NL, FI, NO, Baden-Württemberg/German Land)
- 2 from manufacturers and manufacturers' associations (ACEA and a manufacturer who modifies Volvo trucks)
- 3 user associations (FEMA/motorcyclists, FIVA/historic vehicles; ECF/cyclists)

All comments are published on the Commission Website.¹

1.1. Comments from the equipment sector

The stakeholders from the **equipment sector** welcome the proposal. Several comments propose a simple taking over of the technical solution that they produce and market. This would include an extension of the obligation to trucks registered before 1998. Furthermore, the possibility of a reduced field of vision is not taken into account, and focus would be on additional mirrors and radar/infrared systems). Finally, some stakeholders propose not to limit the retrofit to type-approved vehicles.

The Commission services' comments on these views as follows:

The limitation to trucks registered after 1998 is mainly due to the cost-effectiveness of a retrofitting: the shorter the remaining lifespan of a truck, the lower is the benefit-cost ratio. It can be estimated that the benefit-cost ratio is lower than 1 for vehicles with a remaining lifespan of 4 to 6 years, i.e. vehicles that are today older than 10 to 12 years. Given a date of entry into force in 2008, it is reasonable to limit the scope of the directive to HGVs registered after 1998.

It is correct to accept devices other than mirrors to be retrofitted, if these devices are in line with directive 2003/97/EC. However, it is rather unlikely that a haulage company would

¹ http://ec.europa.eu/transport/road/index_en.htm

retrofit an electronic system for more than 1000 €, if it were possible to merely exchange mirror glasses for less than 150 €. So the option to provide for radar systems is not economically feasible.

The “reduced field of vision” means a field of vision which is only 1% smaller than the one required in Directive 2003/97/EC. Such a reduced field of vision would allow for a rather simple retrofitting of up to 20% of the vehicles. This marginal reduction in the case of a retrofitting obligation is reasonable, in particular since the approach of the proposal is to avoid, if possible, any additional mirror or display, in order to keep the driver’s vision as clear as possible.

1.2. Comments from the road haulage sector

The **haulage associations**, in particular International Road Union, are of the opinion that there is not enough scientific evidence yet, that the money could be better spent on awareness campaigns, or that it should be a voluntary agreement for retrofitting, funded by the governments and respectively the EU. The German haulage association agrees in general on the Commission proposal but suggests longer transition periods and indicates that problems might occur with smaller HGV and exceptional cases.

The Commission services' comments are as follows:

The Commission’s proposal is based on existing studies², which all endorse the fact that an increased field of vision can help saving lives and that the proposal is cost-effective. There is thus no need for further research.

Awareness campaigns as an accompanying measure of the introduction of blind spot mirrors are certainly useful. Therefore, it is indeed advisable to integrate such campaigns in the proposal as recommendation to the Member States to organise accompanying awareness campaigns.

1.3. Road safety associations

The **road safety organisations, including the Member of the European Parliament**, are in favour of the proposal, and they want to keep exemptions to a minimum.

1.4. Vehicle manufacturers

The vehicle **manufacturers do not object to the proposal**. However, they would prefer to limit the obligation to vehicles registered after 2000 (instead of 1998) and to have a higher reduction for the “reduced field of vision”, i.e. 80% instead of 99%.

The Commission services' comments are as follows:

A field of vision which covers only 80% of the field of vision of Directive 2003/97/EC is not acceptable, since this means that the improvement of the existing field is only marginal, and would thus not attain the objectives of the proposal.

² Jacobs Consultancy, Cost-Benefit Analysis of Blind Spot Mirrors – Final Report, August 2004, http://europa.eu.int/comm/transport/road/publications/projectfiles/mirrors_en.htm.

Limiting the scope of the directive to vehicles registered after 2000 makes the retrofitting obligation certainly easier. However, a sizeable amount of vehicles would be excluded from the scope of the instrument by limiting its temporal scope, although from a cost-benefit point of view it would make sense to retrofit them, too. This would be inconsistent with the general approach of the initiative.

1.5. User associations

The motorcyclists and the cyclists association are in favour of the directive since they are the prime beneficiaries of such a measure. The motorcyclists suggest awareness campaigns in addition to the technical requirement. The users of historic vehicles also comment positively on the instrument, as an exemption is proposed for historic vehicles.

1.6. National and regional governments

The reactions from the **national and regional governments** are mixed. Some entirely support the objective and the approach of the proposal. They agree with the reasoning based on costs and benefits and with the role of the inspection bodies for singular cases. They suggest that also vehicles which are not EU-type approved are to be retrofitted, also by giving a higher responsibility to the inspection authorities. Other governments see problems with the exceptional cases and advocate a voluntary agreement. They call for more research and further discussion before proposing an EU measure.

The Commission services' comments as follows

On the basis of the information and the scientific evidence which is currently available, the Commission proposal makes sense. Postponing a decision means missing the window of opportunity, which will close very quickly for new trucks will progressively replace the older ones.

1.7. Conclusion from the stakeholder consultation

The stakeholder consultation has provided useful information from all involved groups in society. However, it did not generate any argument forcing the Commission services to change its overall approach. Some suggestions and clarifications are taken into account in the current proposal.

2. PROBLEM DEFINITION

In its White Paper on European transport policy for 2010³ the European Commission set the target of halving the number of road fatalities (from 50,000 in 2001 to 25,000 in 2010). Although there has been substantial progress in the previous 5 years, there were still more than 41,000 fatalities in 2005 on Europe's roads (Mid Term Review of the 2003 Road Safety Action Plan⁴).

³ Commission White Paper of 12 September 2001: European transport policy for 2010: time to decide, COM/2001/370

⁴ COM/2006/74

A significant number of accidents are caused by drivers of larger vehicles who are not aware that other road users are very close to or beside their own vehicle. These accidents are often related to a change of direction at crossings, junctions or roundabouts, when drivers fail to detect other road users in the so-called blind spots, which exist in the area immediately around their vehicles.

It is estimated that every year, over 400 people lose their life in the European Union in this type of accident. Most of the victims of such accidents are pedestrians or two-wheelers, a particularly vulnerable category of road users.

The European legislator has been attentive to this problem. In 2003, the European Parliament and the Council adopted Directive 2003/97/EC on the approximation of the laws of the Member States relating to the type-approval of devices for indirect vision and of vehicles equipped with these devices⁵. According to this directive, in 2006 new vehicle types and respectively in 2007 new vehicles can only be granted approval by the Member States' authorities if they are equipped with a set of mirrors and other systems of indirect vision fulfilling certain requirements in order to reduce their blind spots. Directive 2003/97/EC was recently amended to require the fitting of wide angle and close proximity mirrors to vehicles above 3.5 tonnes instead of the previous 7.5 tonnes.⁶

While this legislation is clearly beneficial, existing trucks are not covered by it. Given the life-time of heavy goods vehicles (HGV), the effect of the new legislation is therefore quite limited for a long period of time. The EU-25 HGV fleet (>3.5 tonnes) comprises almost 5 Mio vehicles. There are slightly over 300,000 new heavy goods vehicle registrations per year within the EU. This means that the HGV fleet will be completely exchanged in about 16 years from 2007 onwards, i.e. in 2023.⁷

3. OBJECTIVES, SCOPE AND REQUIREMENTS

The objective of this Directive is to improve the field of indirect vision of existing HGVs and subsequently help saving lives on Europe's roads. Since improving the field of indirect vision of existing HGVs involves technical modifications in an already approved and legally authorised system, particular attention is given to the technical feasibility and the economic efficiency of a retrofitting exercise.

For the time being, there is no technical solution available which can cover 100% of the area around a vehicle at ground level. This is the case for passenger vehicles and even more for HGVs. Furthermore, although mirrors have been an excellent means to cover the fields of indirect vision virtually since the invention of the automobile, they do have physical limitations for certain areas, e.g. behind a HGV.

⁵ OJ L 25, 29/01/2004, p. 1.

⁶ OJ L 75, 22/03/2005 p. 33. Commission Directive 2005/27/EC of 29 March 2005 amending, for the purposes of its adaptation to technical progress, Directive 2003/97/EC of the European Parliament and of the Council, concerning the approximation of the laws of the Member States relating to the type-approval of devices for indirect vision and of vehicles equipped with these devices.

⁷ ANFAC/ACEA, European Motor Vehicle Park 2004, January 2006, ACEA website: [http://www.acea.be/ASB20/axidownloads20s.nsf/Category2ACEA/45483306B8C171D9C125712600345336/\\$File/ANFAC-European%20Motor%20vehicle%20parc%202004.pdf](http://www.acea.be/ASB20/axidownloads20s.nsf/Category2ACEA/45483306B8C171D9C125712600345336/$File/ANFAC-European%20Motor%20vehicle%20parc%202004.pdf)

The most important constraint is in fact the limited ability of the driver to gather, perceive and process different information while moving: with the current set of mirrors a driver of a left-hand driven truck performing a right turn, besides watching out ahead and to the left, has to look in two rear mirrors on the right side and one close proximity mirror above the right door. In a truck built after 2007, there will be an additional frontal mirror to cover also the area directly in front of the mirror at ground level.

Additional electronic systems to cover the so-called blind spots, which would, especially on existing vehicles, require considerable structural modifications and incur significant costs, will most likely not play a major role for retrofitting. As long as these systems are in conformity with the requirements of Directive 2003/97/EC they may be installed. The technical approach of the directive for new vehicles, which can be considered to be the current state of art, is in fact the frame of reference for any possible retrofitting exercise.

In summary, and as further explained in the proposal and the explanatory memorandum, the proposal contains the following main features:

Scope

Heavy goods vehicles over 3.5 tonnes (i.e. international categories N2 and N3),

- providing for a mounting height for the close proximity mirror (class V) higher than 2.0m;
- being registered within 10 years prior to the expected entry into force of the directive, i.e. 1998;

Requirements

A. Standard technical solution

Vehicles which are in the scope of the directive shall fulfil the requirements of Directive 2003/97/EC with regard to the field of indirect vision and the curvature of the class IV and class V mirrors on the passenger side.

B. Reduced standard technical solution

For a number of truck models it is possible to achieve almost 100% (>99%) of the overall field of vision for class IV and class V mirrors prescribed in Directive 2003/97/EC through replacing existing glasses by new glasses respecting the maximum curvature without touching the mirror housings. Replacing the complete mirror housing would lead to much higher costs. A combination of class IV and class V mirrors fulfilling the requirements of Directive 2003/97/EC which covers at least 99% of the overall field of vision of this directive are also permitted.

C. Exceptional solutions

There are heavy goods vehicles which cannot achieve the field of vision required by Directive 2003/97/EC or the reduced field of vision as described above, through a mere exchange of existing mirror glasses or the exchange of the whole mirror without changing the structure of the cabin. These vehicles may be fitted with other devices as long as they cover at least the reduced field of vision. Technical inspection bodies may approve such systems on an

individual basis by a visibility test, e.g. with a test person walking through a marked area according to the required field of vision.

Exemptions shall be given to the Member States having already introduced effective retrofitting schemes before the date of the adoption.

D. Further requirements

In particular Member States which have a vehicle stock which differs substantially from the EU average, i.e. their vehicle stock has a far higher average age, may extend the scope of this directive for vehicles registered in their countries to vehicles which were registered before 1998.

4. COSTS AND BENEFITS OF POLICY OPTIONS

In its Road Safety Action Programme “Halving the number of road accident victims in the European Union by 2010: A shared responsibility”⁸, the European Commission stated that “it [would] consider making a legislative proposal aimed at retrofitting heavy vehicles already in circulation”. In 2004, the Commission services conducted therefore a cost-benefit study⁹ on the retrofitting of HGV, light goods vehicles (LGV) and coaches/busses with mirrors/cameras improving their field of indirect vision. M1 vehicles (passenger cars) were taken out of the scope of this study. These vehicles are considered to be less dangerous in terms of indirect vision. Nevertheless, a retrofitting of LGVs was analysed in this study as well.

In a first step, the following cases were assessed with regard to their costs and benefits:

Scenario: for EU25, time period: 2006-2020/benefit-cost ratio	Side view			Front-view		
	HGV	LGV	Bus	HGV	LGV	Bus
Base case	4.1	0.4	0.4	0.6	0.1	0.2
Cameras rather than mirrors	0.6	0.1	0.1			
Increased Mirror Costs + (50%)	2.7	0.2	0.3			
Constant fatality rates	5.5	0.5	0.6			
10% increase in fatality saving (under reporting)	5.3	0.4	0.6			
Urban only areas	2.3	0.2	0.3			

The values in the matrix are the benefit-cost ratios for each of the cases on the basis of the following statistical data, estimations and assumptions:

Vehicle Fleet in the EU-25 in 2003	HGV	LGV	Bus
Number of vehicles [1 Mio.]	4.7	22.5	0.7

⁸ COM/2003/311

⁹ Jacobs 2004.

The costs for retrofitting a side-view and front-view mirrors and are estimated at 150 € each, for a camera system the estimate is 1,000 €.

Estimated number of fatalities saved between from 2006 to 2020 in accidents per vehicle category and area (side or front)	HGV	LGV	Bus
Side-view	1,313	626	27
Front-view	200	137	14

The above mentioned number of fatalities saved as a consequence of an obligation to retrofit systems for indirect vision decreases between 2006 and 2020 almost linearly, since every year old vehicles will be replaced by new vehicles which are fitted with these systems according to Directive 2003/97/EC.

The numbers of fatalities saved are estimated on the basis of the number of fatalities in relevant accidents (i.e. pedestrian/bicyclist killed in an accident involving a right-turning HGV). From pilot studies and in-depth accident analyses¹⁰ it can be estimated that 56% of these accidents are due to the blind spots of HGVs and LGVs. Eventually, the effectiveness of the new mirrors was estimated at 40% for HGV and 30% and 10% for LGV and buses, respectively. Applying these reduction rates to the number of relevant accidents, the above listed numbers of fatalities saved are yielded.

Multiplied by the accident costs (societal cost per fatality including injuries and material damages: about 2 Mio. €¹¹) and with the estimated costs for the safety devices, the study arrives at the benefit-cost ratios of the above table according to the different scenarios. Thus, the total costs of retrofitting all relevant HGV from 2008 onwards are estimated at 600 to 700 Million €, the total benefits in terms of societal cost are estimated at 2.4 Billion €.

Conclusion from the cost-benefit analysis

Retrofitting LGV or buses with mirrors or cameras has a benefit-cost ratio which is in all the cases examined far below 1: the costs outweigh the benefits. For HGV, the benefit-cost ratio is only higher than 1 in the case of the lateral field of indirect vision. The reduction potential for HGV is 100% higher as for LGV and buses together. And the effect of side-view mirrors is by the factor 6 higher than the effect of front-view mirrors. The accident saving potential of the retrofitting of side-view mirrors only to HGV is substantially higher than the potential of all other scenarios together: 1,313 versus 1,003. For the first scenario it would be necessary to retrofit about 4 Million vehicles, in the latter more than 25 Million vehicles are concerned.

Therefore, for policy options, only the constellation “HGV/side-view” is taken into account.

Option 1: No policy change – “do nothing”

¹⁰ Jacobs (2004), p. 88.

¹¹ In Jacobs (2004), the accident costs have been calculated per Member State. The societal cost estimates per fatality include the cost estimates for injured road users and material damages. 2 Mio. € is the average accident cost for one fatality including a proportionate number of injury accidents and material damages in a blind spot mirror accident in the EU.

The “do nothing” option means missing a window of opportunity to save lives with a straightforward and not overly expensive measure. The retrofitting exercise makes only sense if it is finalised before the whole HGV fleet is replaced by new HGV which have mirror sets in line with Directive 2003/97/EC. It can be estimated that this is the case after 2020. The impact of a retrofitting directive is limited in time and decreasing every year.

From 26 January 2007 onwards, when all new vehicles have to be equipped with the new set of mirrors, the benefit-cost is ratio will decrease each year to reach 1 (costs equal benefits) in 2015 or 2016.

Option 2: Apply the full set of requirements of Directive 2003/97/EC for the lateral field of vision to all HGV (>3.5 tonnes)

The application of the full set of requirements of Directive 2003/97/EC for the lateral field of vision to all HGV (>3.5 tonnes) is cost-effective. A benefit-cost ratio of 4.1, or slightly lower with an entry into force date in 2008, scores well in comparison with other considered road safety measures, such as e.g. tyre pressure monitoring systems.

Some Member States have plans to make a retrofitting mandatory at national level. Individual solutions could, however, contradict the vehicle type approval scheme and, thus, create obstacles for the common market. This means that a retrofitting obligation can only be agreed upon at Community level.

Voluntary agreements seem unrealistic. Apart from the German haulage association, the replies from the haulage associations in the public stakeholder consultation show that they are not supporting a retrofit. Thus, it can be doubted that the hauliers are in position to come forward with a voluntary commitment. None of the Member States that have already undertaken a retrofitting (NL, BE, DK) did so on the basis of a voluntary agreement. Germany achieved a voluntary agreement with the German vehicle manufacturer association to install new mirrors to new vehicles earlier than required by directive 2003/97/EC. Although the German hauliers are positive about a retrofit and although the German government is the main supporter of a retrofit there is no voluntary agreement by the German hauliers on retrofitting of existing vehicles. It is because of the lack of a clear business case for the hauliers that a voluntary agreement is not the appropriate measure in the case of retrofitting blind angle mirrors to their vehicles.

However, it is technically feasible to retrofit each HGV with new mirrors fulfilling the requirements of Directive 2003/97/EC. Experience has shown that if solutions do not exist yet, demand will trigger the aftermarket to come up with such solutions.

Option 3: Apply a differentiated set of requirements on the basis of Directive 2003/97/EC for the lateral field of vision to all HGV (>3.5 tonnes)

For more than 50% of the HGV circulating on Europe’s roads, it is possible to replace the old mirror glasses by new ones which are in conformity with Directive 2003/97/EC and cover the required field of indirect vision. Another 25% could be equipped with new glasses if the requirements for retrofitting with regard to the field of vision are slightly reduced (>99%). The costs for the retrofitting in these cases are normally below 150 €.

Most of the remaining 20-25% can be retrofitted with new mirrors at higher yet reasonable costs. In some cases (<10%), in particular if exchanging mirrors required substantial changes in the cabin structure or if there is no mirror available which would fulfil the requirements it is permitted to install additional devices to cover at least the field of vision of Directive 2003/97/EC. These systems have to be approved by the inspection authorities.

In order to make the most out of the closing window of opportunity, to let the manufacturers cope with the demand (they normally produce 300,000 mirrors a year and would have to provide up to 4,000,000 until the directive enters into force), and to give the owners of older trucks more flexibility, it makes sense to foresee a progressive entering into force. HGVs registered after 2004 have to be retrofitted as soon as possible, HGVs registered after 2001 the year after and HGVs registered after 1998 another year later.

This is the option on which the current proposal is based, as it is the outcome of a balancing of interests, respects best the principle of proportionality and the specificities of the various vehicle types.

Exemption of vehicles registered before a certain date

The benefit of retrofitting new mirrors to an existing truck depends on its risk of being involved in a relevant accident. This risk normally decreases with the remaining lifespan of the vehicle. Statistically, it is likely that a 15-years old truck with a remaining lifespan of 1 year has a much lower risk of being involved in a blind spot accident than a 1 year-old truck with a remaining life-span of 15 years. On the other hand, the costs for retrofitting can be more or less the same in both cases. Thus, it can be estimated that the benefit-cost ratio decreases with the age of the vehicle. This is also the reason why any delay of the retrofitting obligation will reduce its effectiveness.

Table 1: NPV according to entry into force¹²

Year of entry into force	Net Present Value
2007	1,855
2008	1,714
2009	1,529
2010	1,336
2011	1,136
2012	0,93
2013	0,719
2014	0,504
2015	0,286
2016	0,065
2017	-0,158

On the basis of existing data from the study, the Commission services assume an average heavy goods vehicle lifespan of 16 years, a date of entry into force of the directive in 2008 and a Net Present Value (NPV) of 1.7 billion € for this date of entry into force.¹³

The “Net Present Value” is calculated by discounting of a series of future costs/benefits, and summing the discounted amounts and the initial investment. Table 1 shows the development of net present value depending on the date of entry into force of a retrofitting directive over the coming years. This consideration can also be used to determine the scope of the directive, i.e. the date from which the retrofitting obligation should apply to be cost-effective. The NPV reaches 0 (it means that the costs equal the benefits) in about 9 years. This means that the costs for such a retrofitting obligation equal the benefits even if the obligation comprises only vehicles with a remaining lifespan of up to 7 years. For the scope of the directive, it can therefore be deduced that a reasonable cut could be 9 to 10 years before entry into force, i.e. 1998.

¹² Data from Jacobs Consulting (2004); own calculation
¹³ Jacobs Consulting (2004).

This rationale is based on the assumption that the costs for retrofitting the vehicle fleet averages 150 €. The retrofitting of older vehicle types might incur higher costs. It is important to take into account that for the technical feasibility of a retrofitting the age of the vehicle type is more important than the age of the vehicle: for instance, it is likely that a truck registered in 2002 being the last of a vehicle type started to be built ten years before cannot be easily retrofitted whereas a truck registered in 1998 can be easily retrofitted since it is the first vehicle from a new vehicle type taking into account more recent requirements.

From consultations with the vehicle manufacturers it can be concluded that, on the basis of currently available technical solutions, almost all vehicles built after 2002, i.e. vehicle types from the late 90s, can easily be retrofitted whereas a large part of the vehicles built before 1998, i.e. older vehicle types, might cause problems.

5. ANALYSIS OF IMPACT

5.1. Social impact

It is estimated that the benefit of the proposal will be to save about 1.200 road fatalities, which means in societal costs: around 2.4 billion Euros. This concerns foremost vulnerable road users, i.e. pedestrians, cyclists and motorcyclists.

Furthermore, enlarging the field of indirect vision is, in general, also welcomed by the drivers. Drivers are well aware of the limits of the present field of vision and they would feel more secure having a better field. Although the new field of vision does not cover 100% of the areas around a truck, it is a substantial improvement and will make drivers feel more comfortable. Truck drivers know about the dangers of the blind spots of their vehicles and better means to cope with these dangers will improve their working environment.

This argument is also valid for the owners of the trucks. Most of them would accept a retrofitting at reasonable costs. Better coverage of blind spots is in fact also a question of Occupational Health and Safety. Fewer accidents in a given fleet reduce operational costs for down-time and insurance premiums. Their main concern with regard to retrofitting is the fear that technical problems in retrofitting mirrors on their trucks could result in significant extra costs.

All in all, the social impact of a retrofitting is positive, not only on the potential victims but also on the users of these systems who have to pay for it.

5.2. Economic impact

The directive has a clear economic impact on the haulage companies. The truck owners have to pay for a measure that helps primarily other road users. However, given the advantages also for the hauliers, it can be assumed that most haulage companies are ready to pay a certain amount for this improvement as long as these costs are not disproportionate and do not cause market distortions.

The rigid application of the requirements for new mirrors could incur substantial costs in singular cases. Although the vast majority of trucks can be equipped with systems that are

already available on the market for less than 150 € there are cases which incur higher costs. In a very limited number of cases a new set of bigger mirrors could even require changes in the cabin structure because of higher wind loads. Especially in such singular cases, inspection authorities have to be flexible and accept exceptional solutions at reasonable costs.

This flexible approach in singular cases is also necessary to prevent market distortion. In fact, one of the main features of the road freight industry in Europe is the preponderance of small firms. It would make a difference if one of these companies having three trucks of the same type that would need changes in the cabin structure to retrofit them, had to pay 1,500 € for each truck while all their competitors have costs in the order of 150 € for each truck.

Apart from the actual retrofitting costs, the directive will create costs for controlling whether the obligation was implemented or not. In most of the cases, i.e. when the existing mirror glasses have been replaced by mirror glasses according to Directive 2003/97/EC, it is sufficient that the inspection bodies check the certificate during the normal regular inspections. In singular cases, inspection bodies have to test the field of indirect vision in a special testing facility. The Dutch inspection authorities have already gathered experiences with this procedure, and there is no evidence of a substantial increase of cost, time or administrative expense.

5.3. Environmental impact

The environmental impact of the retrofitting is limited to scrapping old mirrors and producing new ones. Other environmental impacts do not exist.

5.4. Other impacts – administrative costs

A major problem of a retrofitting obligation is to check whether all trucks concerned by the obligation have been equipped with the necessary mirrors.

- (1) Vehicles might have been type-approved according to Directive 71/127/EEC and subsequent amendments. In most cases, the bigger field of vision required by this proposal of a directive means installing mirrors with a higher curvature which is permitted by Directive 2003/97/EC but not by the older directives. In some Member States, by exchanging mirrors, a truck could be no longer compliant with its original type-approval, unless the new mirrors are type-approved. In this context, the German government has found a solution by permitting mirrors to be replaced as long as they are in conformity with Directive 2003/97/EC. It might in fact be necessary that the some Member States find a solution for this, when transposing this directive.
- (2) Mirrors are currently type approved as an assembly, with the approval mark being placed on the body of the mirror rather than the glass. Replacement glasses are not required to have any approval mark on them, or to be approved. Therefore, if the complete assembly is not replaced, the approval mark on the body will still refer to the old directive, whilst the glass will not have any marking on it to indicate that it complies with the new requirements. In order to put inspection authorities in a position to check whether a mirror complies with the retrofitting requirements, Member States have to foresee a procedure. Normally, it might be sufficient to prove compliance by a certificate issued by the manufacturer of the glasses. Nevertheless, in practice, it is

actually not too difficult for an experienced inspector to distinguish by sight new glasses with a higher curvature from older glasses for the usual vehicle types.

- (3) For the vast majority of vehicles, compliance of the mirrors with this piece of legislation can be checked without incurring high costs. However, vehicles which cannot be retrofitted with new mirror glasses or new mirrors at reasonable cost need to be equipped with alternative devices. These vehicles need individual approval by an inspection authority. Inspection authorities will gather experience with appropriate systems for different vehicle types and should exchange information on possible technical solutions which have been approved. Such lists exist in the Netherlands and can facilitate the individual approval and, subsequently, substantially reduce costs for this approval.

6. MONITORING AND EVALUATION

The transposition of this Directive in the Member States will be monitored. Furthermore, with the methodology of the cost-benefit analysis, as summarised in Chapter 4, it is possible to monitor the impact of this directive: if the retrofitting requirement is successful, there should be a measurable reduction in the numbers of pedestrian/bicyclist killed in an accident involving a right-turning HGV (left-turning in the UK and IE). These figures are available in the Commission accident database CARE.