

Partial Regulatory Impact Assessment

1. Title of Proposal

Retrofitting of Mirrors to Increase the Field of Indirect Vision (Blind Spot) of Goods Vehicles.

Note: Directives 2003/97/EC and 2005/29/EC include provisions for type approval of mirrors and their installation on new goods vehicles. They also include provisions that apply only to cars. These have been dealt with in separate RIA's.

2. Purpose and Intended Effect

Objective: To improve the exterior field of indirect vision of existing goods vehicles of mass over 3.5 tonnes (categories N₂ and N₃), which are approved to Directive 71/127/EC or subsequent amendments up to and including 88/321/EC, provide a mounting height for the class V (close proximity) mirror higher than 2m; and were registered within 10 years of the transposition date of the Directive. Measures to ensure compliance with the Directive are expected to commence in January 2010 with full compliance by January 2011.

Background: In 2003, the European Council and Parliament agreed a new Directive (2003/97/EC) on rear view mirrors for vehicles. This was followed by an amending Directive (2005/27/EC) which extended the requirement to certain goods vehicles in the 3.5 to 7.5 tonne mass range, affecting only those with cabs of sufficient height to enable the class V mirrors to be fitted at least two metres from the ground and still be visible to the driver. These Directives require all new goods vehicles registered from 26 January 2007 to be equipped with compliant mirrors. The main effect is to increase the number of mirrors required to be fitted in order to reduce blind spots; particularly those in close proximity to high-sided vehicles, where the driver often has an obstructed view of pedestrians, cyclists and other vehicles.

However, the existing population of around 5 million goods vehicles within the European Union will not be fully replaced for about 16 years (2023 at the earliest). Until then, the danger will continue to exist, even with existing legislation. Therefore, the European Commission has proposed extending the requirement to cover the retrofitting of blind spot mirrors to all applicable existing goods vehicles. As a result, a retro fit Directive is intended to be entered into force by January 2008.

The retrofitting Directive proposed by the European Commission is based on the fact that goods vehicles above 3.5 tonnes and type approved after 1990 (Directive 88/321/EC), which may already be equipped with class IV (wide angle) and class V (close proximity) mirrors can be upgraded at a reasonable cost, in many cases without changing the mirror housings. The road safety benefits of this Directive are considered to be cost effective even when taking into account that operators of some vehicles would be required to fit additional mirrors. Additional mirrors are required because;

- class IV and class V mirrors are not obligatory on goods vehicles between 3.5 and 7.5 tonnes; and
- class V mirrors are not obligatory on goods vehicles between 7.5 and 12 tonnes.

In addition to this, there is no scope for mirror coverage to the front of the vehicle within the European Commission proposal, which is a particular problem for pedestrian accidents in the UK. The UK Government is therefore not convinced that this proposal would sufficiently cover the relevant blind spots and may wish to propose other solutions, which are included in this RIA.

Rationale for Government Intervention: On GB roads over 3,200 people have been killed and 30,000 seriously injured annually in recent years. Although it is difficult to estimate how many casualties result directly from the limitations of current vehicle mirror systems, interrogation of the STATS 19 database for 2005 revealed the following facts (see table 1 below):

- 38 vulnerable road users were killed in GB due to being involved in a collision with the sides of heavy goods vehicles;
- 4 car occupants were killed in side swipe incidents involving heavy goods vehicles on multi-lane roads; and
- 43 vulnerable road users were killed in GB in frontal impacts with goods vehicles above 7.5 tonnes mass and, of these, 5 were killed as the vehicle moved off from rest.

Table 1 - Fatalities in accident with HGV's					
Point of First Impact with HGV	Accidents with Vulnerable Road Users				Side - Swipe Accidents
	Pedestrian	Pedal Cycle	Motorcycle	Total	
Side (all HGV's)	13	10	15	38	4
Front (HGV's >7.5 t)	28	7	8	43	n/a
Total	41	17	23	81	4

If it is estimated that measures to address the blind spots to the side of heavy goods vehicles are 25% effective, then we would estimate that up to 10.5 lives per annum could be saved. For the blind spot to the front a further 8 lives could be saved per annum, based on an estimate that any measure will be more effective (90%) at preventing accidents that occur when the vehicle is moving off from rest, but less effective (10%) for any other manoeuvre, as measure will only be effective at low speeds, such as when a refuse truck is operating, due to the limited distance ahead that is possible to view. Therefore, in total, it is estimated that up to 18 lives could be saved per annum (see table 2 below).

Table 2 - Estimated lives saved					
Accident	Vehicle manoeuvre	Fatalities	Effectiveness of measure	Lives Saved	Lives Saved Rounded
Vulnerable road users struck by FRONT of HGV	Moving off	5	90%	4.5	8
	Other	38	10%	3.8	
Vulnerable road users struck by SIDE of HGV	All	38	25%	9.5	9
Side Swipe	Changing lane and Overtaking	4	25%	1	1
Total		85	-	17.8	18

It is necessary to make allowance for the year on year reduction in the number of lives which would be saved by the retro fit action as the existing vehicle fleet depletes and the new fleet, which will be fully compliant with Directive 2003/97, increases. Transport Statistics 2005 was interrogated and projections made on new vehicle registrations for the period up to 2020. From these data, the annual reductions in the lives saved by the retro fit measures could be calculated and, for ease of calculation in this RIA, an average (50%) of these figures was

taken, which gives a maximum average saving of 9 lives per annum for these measures. This same estimate was used for fleet depletion in the calculations for the annual vehicle operating and maintenance costs (see table 3 below).

Table 3 - Calculation of Vehicle Fleet Changes and Average Number of Lives Saved per Annum							
Year	New Veh per Annum	New Veh Accumulative	% Total Fleet	% Existing Fleet	Lives Saved Front	Lives Saved Side	Lives Saved All
					(8 Max)	(10 Max)	(18 Max)
1	49	49	11.3%	88.7%	7	9	16
2	48	97	22.4%	77.6%	6	8	14
3	41	138	31.9%	68.1%	5	7	12
4	41	179	41.3%	58.7%	5	6	11
5	37	216	49.9%	50.1%	4	5	9
6	31	247	57.0%	43.0%	3	4	8
7	28	275	63.5%	36.5%	3	4	7
8	22	297	68.6%	31.4%	3	3	6
9	19	316	73.0%	27.0%	2	3	5
10	17	333	76.9%	23.1%	2	2	4
11	12	345	79.7%	20.3%	2	2	4
12	8	353	81.5%	18.5%	1	2	3
Average number of lives saved per annum					4	5	9

3. Consultation

- Within Government: We shall be consulting on the changes required to the UK Construction and Use Regulations in order to implement these requirements.
- Public Consultation: All major stakeholders, representing vehicle and component manufacturing, vehicle operators and consumer interests have been involved in Commission Working Group discussions concerning this proposal.

4. Options

Five options are examined:

- **Option 1:** assumes no action taken and is the baseline for all calculations.

Risk – Vulnerable road users would continue to be killed at the same rate and a window of opportunity would have been missed to save lives as a result of this measure. There would also be cost implications if the UK were involved in infraction proceedings as a result of non-compliance with any Directive resulting from this proposal.

- **Option 2:** assumes adoption of the measures within the EC proposal.

The measures are:

The mandatory upgrade of existing class V 'close proximity' mirrors on the passenger side of all goods vehicles over 3.5 tonnes, where such mirrors can be fitted at least 2m from the ground and still be visible to the driver; or

The mandatory installation of additional class V 'close proximity' mirrors on the passenger side of all goods vehicles over 3.5 tonnes, where such mirrors were not originally installed and they can be fitted at least 2m from the ground and still be visible to the driver; and

The mandatory upgrade of existing class IV 'wide angle' mirrors on the passenger side of goods vehicles that fall into the above category; or

The mandatory installation of additional class IV 'wide angle' mirrors on the passenger side of goods vehicles that fall into the above category.

The Commission estimates that 75% of the fleet will accept replacement mirror glasses and 25% will require new mirrors.

Risk – Implementation of the proposal will initially be through changes to the UK Construction and Use Regulations and enforcement by means of roadside and annual roadworthiness checks. There is a risk that these checks may prove deficient or impractical as it would be necessary to confirm each mirror glass conforms by a practical test, as there are no marking requirements for replacement glasses. An additional risk is that vehicle door construction may not be designed to cope with the weight and wind loading of additional mirrors, which could lead to premature failure and liability claims.

- **Option 3:** assumes adoption of a supplementary dead angle mirror system.

The measures are:

The mandatory installation of an internally or externally fitted 'Dead Angle Mirror System' on the passenger side of all goods vehicles, which increases the indirect vision for the driver to 95% of that required by Directive 2003/97/EC.

This option would only be for vehicles where it is not technically possible for the exterior mirrors to be modified or added. Only small numbers of vehicles should be affected but the calculations are based on full implementation.

Risk –Implementation of the Directive will initially be through changes to the UK Construction and Use Regulations and enforcement by means of roadside and annual roadworthiness checks. There is a very small risk that these checks may prove deficient and performance requirements or approval of this type of mirror may be necessary but, under enforcement conditions, the presence of these mirrors would be easier to confirm than those in Option 2.

- **Option 4:** assumes adoption of a front mirror system.

The measures are:

The mandatory installation of one class VI 'front mirror', or equivalent, on all goods vehicles over 7.5 tonnes, which will increase the indirect vision for the driver to the front of the vehicle. This option would be in addition to any of Options 1 to 3.

Risk - Vehicles may not have suitable mounting points, requiring costly adaptation of the vehicle. Implementation of the Directive will initially be through changes to the UK Construction and Use Regulations and enforcement by means of roadside and annual roadworthiness checks. There is a very small risk that these checks may prove deficient but, under enforcement conditions, these mirrors would normally be easy to confirm.

- **Option 5:** assumes adoption of both Option 2 and Option 4.

The measures are:

The adoption of the measures within the EC proposal as detailed in Option 2 plus the adoption of a front mirror system as detailed in Option 4.

Risk – Implementation of the proposal will initially be through changes to the UK Construction and Use Regulations and enforcement by means of roadside and annual roadworthiness checks. There is a risk that these checks may prove deficient or impractical as, under enforcement conditions, front mirrors would normally be easy to confirm, but it would be necessary to confirm each side mirror glass conforms by a practical test, as there are no marking requirements for replacement glasses. An additional risk is that vehicle cab or door construction may not be designed to cope with the weight and wind loading of additional mirrors, which could either require costly adaptation of the vehicles or lead to premature failure and liability claims.

- **Option 6:** assumes full adoption of Directives 2003/97/EC and 2005/27/EC.

The measures are:

The mandatory installation of the latest specification Class V 'close proximity' mirrors on the passenger side of all goods vehicles over 3.5 tonnes, where such mirrors can be fitted at least 2m from the ground and still be visible to the driver.

The mandatory installation of the latest specification Class IV 'wide angle' mirrors on both sides of goods vehicles that fall into the above category.

The mandatory installation of one Class VI 'front mirror' on all goods vehicles over 7.5 tonnes.

Risk - Vehicles may not have suitable mounting points, requiring costly adaptation of the vehicle. There is also the risk that vehicle door construction may not be designed to cope with the weight and wind loading of additional mirrors, which could lead to premature failure and liability claims. Implementation of the Directives will initially be through changes to the UK Construction and Use Regulations and enforcement by means of roadside and annual roadworthiness checks. There is a risk that these checks may prove deficient as it would be necessary to confirm each mirror marking.

5. Costs and Benefits

The costs and benefits given below apply to the UK only.

- **Sectors and Groups Affected**
 - Vehicle manufacturers;
 - Replacement mirror and glass manufacturers;
 - Vehicle owners and operators; and
 - End users and vulnerable road users.

This policy has been assessed for race relevance; a Race Impact Assessment is not required.

- **Benefits**

Social

Option 1 - no perceived benefits.

Options 2 to 6 - would lead to a reduction in the numbers of pedestrian, cyclist and car occupant casualties due to collisions with goods vehicles.

Economic

Option 1 - is estimated to have no quantifiable benefits.

Options 2 to 6 - are estimated to deliver an average of up to 9 fewer deaths and 45 fewer serious injuries per annum. These will depend on which measures are adopted and, using Departmental casualty values from Highways Economic Note No1: 2006 (fatal = £1,428,180.00 and serious injury = £160,480.00), this equates to average annual savings of up to £20,075,220.00, as detailed in **Annex 1**.

- **Costs**

5.1 Business Sectors Affected

Options 2 to 6 - This is a retrofit requirement and manufacturers of goods vehicles should not be affected other than as suppliers of replacement mirrors or glasses. However, mirror manufacturers will be affected but, since the measures will result in an overall increase in the number of mirrors required, this would result in increased business opportunities for these manufacturers. It is not known what the existing stocks of mirrors and glasses conforming to Directive 71/127/EEC would be, but it is assumed these would be utilised for vehicles not covered by this requirement (i.e. pre 1998 vehicles).

Ultimately, the costs resulting from the increased requirements will fall to the end user, either the vehicle operator or a private owner. Since all organisations use vehicles to some extent, the cost will be spread across all business sectors, charities and voluntary organisations.

5.2 Compliance Costs for a Typical Business

Mirror Manufacturer: The proposals require changes in the specifications of the replacement mirror glasses, the installation of replacement mirrors or additional mirrors. Development costs could be significant, but these should be recovered quickly as there would be a high initial demand caused by the need to modify the affected vehicles before the deadline.

5.3 Compliance Costs for Vehicle Users

It is anticipated that the cost of mirrors and their installation, to meet the revised requirements and any increase in operating costs, will ultimately be met by the vehicle user.

5.4 Installation Cost for Each Measure

According to the 2005 figures (Transport Statistics for Great Britain 2005), approximately 441,000 Goods Vehicles are registered in Great Britain; of which 268,000 were registered since 1998. Of these, around 97,000 are between 3.5 and 7.5 tonnes and the Department estimates that 20% of these vehicles (19,500) are of the type that could require the mirrors to be fitted. Between 7.5 and 12 tonnes, around 7,200 vehicles are affected and the balance, around 181,200 vehicles, are over 12 tonnes.

Installation Cost for Each Vehicle Type Based on the Adopted Measure				
Vehicle Type	3.5 to 7.5T	7.5 to 12T	Over 12T	All Vehicles
Option 1	£0.00	£0.00	£0.00	£0.00
Option 2	£11,154,000.00	£3,465,000.00	£70,758,600.00	£85,377,600.00
Option 3	£3,022,500.00	£1,116,000.00	£28,086,000.00	£32,224,500.00
Option 4	£0.00	£864,000.00	£21,744,000.00	£22,608,000.00
Option 5	£11,154,000.00	£4,329,000.00	£92,502,600.00	£107,985,600.00
Option 6	£19,656,000.00	£8,121,600.00	£204,393,600.00	£232,171,200.00

Calculations for the installation costs of all measures for each vehicle type are detailed in **Annex 2**.

5.5 Vehicle Operating Costs

Increased operating costs could arise through increased fuel consumption or maintenance. Dependant on the measures adopted, fuel consumption may increase as a result of the extra weight or reduced aerodynamics due to the **additional** mirrors.

The proportional weight increase is dependant on the size of the vehicle and, utilising figures from previous research, we estimate that the additional mirrors required in order to comply with Directives 2003/97/EC and 2005/27/EC increase the weight of the vehicle by 0.025% (3kg on a 12 tonne vehicle), which in turn increases fuel consumption by 0.015%. Aerodynamic drag is likely to be influenced by various factors such as the average speed of the vehicle, the size and nature of the load being carried and the other aerodynamic features of the vehicle, but is likely to have a similar effect on fuel consumption to the increase in mass. Therefore, the combined effect of weight and drag on fuel consumption is estimated at a 0.025% increase.

The annual fuel consumption of all Heavy Goods Vehicles is estimated to be 118 billion litres and this would increase by 0.025% if the entire fleet were equipped with the maximum number of additional mirrors required in order to comply with Directives 2003/97/EC and 2005/27/EC. Analysis of the Heavy Goods Vehicle statistics allows calculation of the percentage of the total fleet affected by each measure proposed in this document and suggests that the increase in fuel consumption will affect between 2% and 20% of the total fleet, dependant on which measures are accepted, when depletion of the fleet is taken into account. The best case, affecting 2% of the fleet, would increase fuel consumption by 590,000 litres and, with an average fuel cost of £0.35 per litre, after stripping out tax and duty, the increased fuel costs are calculated as £206,500.00 per annum. Likewise, the worst case, affecting 20% of the fleet, would increase fuel consumption by 5,900,000 litres and, with an average fuel cost of £0.35 per litre, after stripping out tax and duty, these increased fuel costs are calculated as £2,065,000.00 per annum. As burning 1 litre of diesel fuel produces 2.64kg of CO₂, the best case equates to an additional 1,558 tonnes of CO₂ per annum being emitted into the atmosphere and, the worst case equates to an additional 15,576 tonnes of CO₂ per annum being emitted into the atmosphere.

Based on the above calculations, the potential additional fuel and CO₂ figures for each option and vehicle type are as follows:

Annual Vehicle Operating Cost Option 2			
Vehicle Type	Additional Fuel Consumed per Annum	Cost of Additional Fuel Consumed per Annum	Additional Tonnes of CO ₂ per Annum into Atmosphere
3.5 to 7.5T	501,500	£175,525.00	1,324
7.5 to 12T	88,500	£30,975.00	234
Over 12T	N/A	N/A	N/A
All Vehicles	590,000	£206,500.00	1,558

Annual Vehicle Operating Cost Option 4			
Vehicle Type	Additional Fuel Consumed per Annum	Cost of Additional Fuel Consumed per Annum	Additional Tonnes of CO ₂ per Annum into Atmosphere
3.5 to 7.5T	N/A	N/A	N/A
7.5 to 12T	88,500	£30,975.00	234
Over 12T	2,419,000	£846,650.00	6,386
All Vehicles	2,507,500	£877,625.00	6,620

Annual Vehicle Operating Cost Option 5			
Vehicle Type	Additional Fuel Consumed per Annum	Cost of Additional Fuel Consumed per Annum	Additional Tonnes of CO ₂ per Annum into Atmosphere
3.5 to 7.5T	501,500	£175,525.00	1,324
7.5 to 12T	177,000	£61,950.00	467
Over 12T	2,419,000	£846,650.00	6,386
All Vehicles	3,097,500	£1,084,125.00	8,177

Annual Vehicle Operating Cost Option 6			
Vehicle Type	Additional Fuel Consumed per Annum	Cost of Additional Fuel Consumed per Annum	Additional Tonnes of CO ₂ per Annum into Atmosphere
3.5 to 7.5T	1,003,000	£351,050.00	2,648
7.5 to 12T	265,500	£92,925.00	701
Over 12T	4,631,500	£1,621,025.00	12,227
All Vehicles	5,900,000	£2,065,000.00	15,576

The vehicle operating costs taken from this table and used in section 5.7 (Total Costs) of this RIA, shown in Annex 4, are calculated from the number of additional external mirrors required for each option compared to those required by Directives 2003/97/EC and 2005/27/EC.

5.6 Maintenance

Mirrors require very little maintenance, but are sometimes subjected to damage. To cater for this, and allowing for depletion of the existing fleet, it is assumed that 25% of the **additional** mirrors required by the new regulation will need to be replaced once during the lifetime of the vehicle. This means that for every additional £1.00 of additional mirror cost, an additional £0.25 is set aside for the cost of a replacement mirror, with an additional £25 per mirror allocated for the labour cost of replacement.

Annual Maintenance Cost for Each Vehicle Type Based on the Adopted Measure				
Vehicle Type	3.5 to 7.5T	7.5 to 12T	Over 12T	All Vehicles
Option 1	£0.00	£0.00	£0.00	£0.00
Option 2	£424,125.00	£78,300.00	£0.00	£502,425.00
Option 3	£105,625.00	£39,000.00	£981,500.00	£1,126,125.00
Option 4	£0.00	£27,333.33	£717,250.00	£744,583.33
Option 5	£424,125.00	£105,633.33	£717,250.00	£1,247,008.33
Option 6	£433,875.00	£213,600.00	£5,375,600.00	£6,023,075.00

The calculations for the annual maintenance cost for each measure and vehicle type are detailed in **Annex 3**.

5.7 Total Costs

Total Annual Cost for Each Vehicle Type Based on the Adopted Measure				
Vehicle Type	3.5 to 7.5T	7.5 to 12T	Over 12T	All Vehicles
Option 1	£0.00	£0.00	£0.00	£0.00
Option 2	£1,529,150.00	£398,025.00	£5,896,550.00	£7,823,725.00
Option 3	£357,500.00	£132,000.00	£3,322,000.00	£3,811,500.00
Option 4	£0.00	£130,308.33	£3,375,900.00	£3,506,208.33
Option 5	£1,529,150.00	£528,333.33	£9,272,450.00	£11,329,933.33
Option 6	£2,422,925.00	£983,325.00	£24,029,425.00	£27,435,675.00

The calculations for the total annual cost for each measure and vehicle type are detailed in **Annex 4**.

6. Small Firms Impact Test

These measures will affect all goods vehicles operators with vehicles registered from about 1998 onwards.

Approximately 94% of all operators have fleets of 10 or fewer vehicles, but, these represent less than 50% of the total vehicle fleet¹.

It is expected that the smaller fleets will tend to operate the older vehicles and are consequently less likely to be impacted by the proposed measure, than the larger fleet operators with newer vehicles.

Therefore, it is not anticipated that the proposal will have a disproportionately high impact on small businesses.

7. Competition Assessment

A competition assessment has been carried out, which has indicated no significant competition implications. Details are contained in **Annex 6**.

¹ Road Freight Statistics 2005, DfT publication, June 2006.
<http://www.dft.gov.uk/162259/162469/rfs05complete?version=1>

8. Enforcement, Sanctions and Monitoring

It is intended that the new Directives will be implemented initially through changes to the UK Construction and Use Regulations which will require that the additional mirrors are fitted to and maintained on all affected goods vehicles in use on the road. Enforcement of Construction and Use requirements is by means of roadside enforcement and annual roadworthiness checks.

9. Implementation and delivery plan

The Directive will be implemented in accordance with the normal procedures as described in paragraph 8 above.

10. Post Implementation Review

Article 3 of the Directive requires the Commission to carry out a detailed study to assess whether the amendments introduced by the Directive are having a positive effect on road safety. This review should be completed by 2010.

11. Summary

Option 1 is considered to have no significant costs or benefits, but there would be cost implications if the UK were involved in infraction proceedings as a result of non-compliance with the Directive.

Benefit / Cost Summary for Each Vehicle Type Based on the Adopted Measure				
Vehicle Type	3.5 to 7.5T	7.5 to 12T	Over 12T	All Vehicles
Option 1 - Do nothing (Baseline)	N/A	N/A	N/A	N/A
Option 2 - EC Proposal	0.7:1	0.8:1	1.7:1	1.4:1
Option 3 - Supplementary mirror	2.8:1	2.5:1	2.9:1	2.9:1
Option 4 - Front mirrors	N/A	2.1:1	2.3:1	2.3:1
Option 5 - EC proposal + Front mirror	0.7:1	1.2:1	1.9:1	1.7:1
Option 6 - Full compliance with 2003/97	0.4:1	0.7:1	0.7:1	0.7:1

The calculations for the benefit / cost summary for each measure and vehicle type are detailed in **Annex 5**.

ANNEX 1 – CASUALTY SAVINGS FOR EACH VEHICLE TYPE BASED ON THE MEASURES ADOPTED

5. Costs and Benefits

• **Economic Benefits**

Casualty Savings for Each Vehicle Type Based on Adoption of All Front and Rear Vision Measures (Option 5 or 6)				
Injury	Individual Cost	All Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	100%	9	£12,853,620.00
Serious	£160,480.00	100%	45	£7,221,600.00
Total				£20,075,220.00
Injury	Individual Cost	Over 12 tonnes Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	88%	7.9	£11,282,622.00
Serious	£160,480.00	88%	39.6	£6,355,008.00
Total				£17,637,630.00
Injury	Individual Cost	7.5 - 12 tonnes Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	3%	0.3	£428,454.00
Serious	£160,480.00	3%	1.4	£224,672.00
Total				£653,126.00
Injury	Individual Cost	3.5 - 7.5 tonnes Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	9%	0.8	£1,142,544.00
Serious	£160,480.00	9%	4	£641,920.00
Total				£1,784,464.00

Casualty Savings for Each Vehicle Type Based on Adoption of Front Vision Measures Only (Option 4)				
Injury	Individual Cost	All Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	100%	4	£5,712,720.00
Serious	£160,480.00	100%	20	£3,209,600.00
Total				£8,922,320.00
Injury	Individual Cost	Over 12 tonnes Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	88%	3.52	£5,027,193.60
Serious	£160,480.00	88%	17.6	£2,824,448.00
Total				£7,851,641.60
Injury	Individual Cost	7.5 - 12 tonnes Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	3%	0.12	£171,381.60
Serious	£160,480.00	3%	0.6	£96,288.00
Total				£267,669.60
Injury	Individual Cost	3.5 - 7.5 tonnes Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	9%	0.36	£514,144.80
Serious	£160,480.00	9%	1.8	£288,864.00
Total				£803,008.80

Casualty Savings for Each Vehicle Type Based on Adoption of Rear Vision Measures Only (Option 2)				
Injury	Individual Cost	All Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	100%	5	£7,140,900.00
Serious	£160,480.00	100%	25	£4,012,000.00
Total				£11,152,900.00
Injury	Individual Cost	Over 12 tonnes Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	88%	4.4	£6,283,992.00
Serious	£160,480.00	88%	22	£3,530,560.00
Total				£9,814,552.00
Injury	Individual Cost	7.5 - 12 tonnes Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	3%	0.15	£214,227.00
Serious	£160,480.00	3%	0.75	£120,360.00
Total				£334,587.00
Injury	Individual Cost	3.5 - 7.5 tonnes Vehicles	Casualties Saved	Annual Saving
Fatal	£1,428,180.00	9%	0.45	£642,681.00
Serious	£160,480.00	9%	2.25	£361,080.00
Total				£1,003,761.00

ANNEX 2 – INSTALLATION COST FOR EACH MEASURE AND VEHICLE TYPE

5.4 Installation Cost for Each Measure

Option 1 - The cost is assumed to be zero and is the baseline for all calculations

Option 1 - Do Nothing				
Vehicle Type	Replacement Mirror or Glass Requirement	Cost per Vehicle Including Installation	Number of Vehicles	Adoption Cost
3.5 to 7.5 tonnes	None	£0.00	None	£0.00
7.5 to 12 tonnes	None	£0.00	None	£0.00
Over 12 tonnes	None	£0.00	None	£0.00
All Vehicles	None	£0.00	None	£0.00

Option 2 - Based on the need to replace 75% mirror glasses and 25% mirrors, at an average cost of £115.00 for each replacement mirror glass and £236.00 for each replacement mirror plus the installation of additional mirrors where they are not original equipment, at an average cost of £236.00 for each additional mirror; with an approximate installation cost of £50.00 for each mirror or glass, the total one off cost of retrofitting to all appropriate existing goods vehicles would be as follows:

Option 2 - Calculation for Replacement of Mirror Glasses to 75% of the Fleet				
Vehicle Type	Replacement Mirror Glass Requirement	Cost per Vehicle Including Installation	Number of Vehicles	Total Cost
3.5 to 7.5 tonnes	None	£0.00	None	£0.00
7.5 to 12 tonnes	1 x Class V	£165.00	5,400	£891,000.00
Over 12 tonnes	1 x Class IV 1 x Class V	£330.00	135,900	£44,847,000.00
All Vehicles			141,300	£45,738,000.00

Option 2 - Calculation for Replacement of Mirrors to 25% of the Fleet				
Vehicle Type	Replacement Mirror Requirement	Cost per Vehicle Including Installation	Number of Vehicles	Total Cost
3.5 to 7.5 tonnes	None	£0.00	None	£0.00
7.5 to 12 tonnes	1 x Class V	£286.00	1,800	£514,800.00
Over 12 tonnes	1 x Class IV 1 x Class V	£572.00	45,300	£25,911,600.00
All Vehicles			47,100	£26,426,400.00

Option 2 - Calculation for installation of Additional Mirrors Where They Are Not Original Equipment				
Vehicle Type	Replacement Mirror Requirement	Cost per Vehicle Including Installation	Number of Vehicles	Total Cost
3.5 to 7.5 tonnes	1 x Class IV 1 x Class V	£572.00	19,500	£11,154,000.00
7.5 to 12 tonnes	1 x Class IV	£286.00	7,200	£2,059,200.00
Over 12 tonnes	None	£0.00	None	£0.00
All Vehicles			26,700	£13,213,200.00

Option 2 - Adoption of the Measures Within the EC Proposal				
Vehicle Type	Additional Mirror Requirement	Cost per Vehicle Including Installation	Number of Vehicles	Adoption Cost
3.5 to 7.5 tonnes	1 x Class IV 1 x Class V	£572.00	19,500	£11,154,000.00
7.5 to 12 tonnes	1 x Class IV 1 x Class V	£165.00 / £286.00	7,200	£3,465,000.00
Over 12 tonnes	1 x Class IV 1 x Class V	£330.00 / £572.00	181,200	£70,758,600.00
All Vehicles			207,900	£85,377,600.00

Option 3 - Based on an average cost of £105.00 for a 'Dead Angle Mirror' and an approximate installation cost of £50.00 each, the total one off cost of retro fitting to all appropriate existing goods vehicles would be as follows:

Option 3 - Adoption of a Supplementary Dead Angle Mirror System				
Vehicle Type	Additional Mirror Requirement	Cost per Vehicle Including Installation	Number of Vehicles	Adoption Cost
3.5 to 7.5 tonnes	1 x Dead Angle Mirror	£155.00	19,500	£3,022,500.00
7.5 to 12 tonnes	1 x Dead Angle Mirror	£155.00	7,200	£1,116,000.00
Over 12 tonnes	1 x Dead Angle Mirror	£155.00	181,200	£28,086,000.00
All Vehicles			207,900	£32,224,500.00

Option 4 - Based on an average cost of £70.00 for a class VI 'Front Mirror' and an approximate installation cost of £50.00 each, the total one-off cost of retro fitting to all appropriate existing goods vehicles would be as follows:

Option 4 - Adoption of a Front Mirror System				
Vehicle Type	Additional Mirror Requirement	Cost per Vehicle Including Installation	Number of Vehicles	Adoption Cost
3.5 to 7.5 tonnes	N/A	N/A	N/A	N/A
7.5 to 12 tonnes	1 x Class VI	£120.00	7,200	£864,000.00
Over 12 tonnes	1 x Class VI	£120.00	181,200	£21,744,000.00
All Vehicles			188,400	£22,608,000.00

Option 5 – Based on the costs for adoption of the measures within the EC proposal, as detailed in Option 2, plus the adoption of a front mirror system, as detailed in Option 4, the total one off cost of retro fitting to all appropriate existing goods vehicles would be as follows:

Option 5 - Adoption of the Measures Within the EC Proposal Plus a Front Mirror System				
Vehicle Type	Replacement Mirror Requirement	Cost per Vehicle Including Installation	Number of Vehicles	Adoption Cost
3.5 to 7.5 tonnes	1 x Class IV 1 x Class V	£572.00	19,500	£11,154,000.00
7.5 to 12 tonnes	1 x Class IV 1 x Class V 1 x Class VI	£165 / £286 / £120	7,200	£4,329,000.00
Over 12 tonnes	1 x Class IV 1 x Class V 1 x Class VI	£330 / £572 / £120	181,200	£92,502,600.00
All Vehicles			207,900	£107,985,600.00

Option 6 – This option could require extensive modifications to the cabs of some older vehicles due to the higher wind loads caused by installing larger mirrors. Assuming 10% of the vehicle fleet is affected and the modification cost is £1500.00 per vehicle, this would equate to an additional £150.00 on the cost of every vehicle in the parc. Therefore, based on an average cost of £236.00 for each Class IV and Class V replacement mirror and £70.00 for each Class VI replacement mirror, an approximate installation cost of £50.00 per mirror and an additional £150.00 per vehicle, the total one off cost of retro fitting to all appropriate existing goods vehicles would be as follows:

Option 6 - Adoption of Mirror Requirements for Directives 2003/97/EC and 2005/27/EC				
Vehicle Type	Replacement Mirror Requirement	Cost per Vehicle Including Installation	Number of Vehicles	Adoption Cost
3.5 to 7.5 tonnes	2 x Class IV 1 x Class V	£1,008.00	19,500	£19,656,000.00
7.5 to 12 tonnes	2 x Class IV 1 x Class V 1 x Class VI	£1,128.00	7,200	£8,121,600.00
Over 12 tonnes	2 x Class IV 1 x Class V 1 x Class VI	£1,128.00	181,200	£204,393,600.00
All Vehicles			207,900	£232,171,200.00

ANNEX 3 – ANNUAL MAINTENANCE COST FOR EACH MEASURE AND VEHICLE TYPE

5.6 Maintenance

The calculations for the annual maintenance cost for each option and vehicle type are as follows:

Replacement units: $0.25 \times \text{No of additional mirrors} \times \text{Cost of additional mirrors} =$
 Labour charges: $0.25 \times \text{No of additional mirrors} \times \text{£25} =$
 For the purposes of this RIA, the annual maintenance cost is calculated over 12 years (2008 to 2020)

Option 1 - Annual Maintenance Cost for Each Vehicle Type				
Vehicle Type	3.5 to 7.5 tonnes	7.5 to 12 tonnes	Over 12 tonnes	All Vehicles
Number of Additional Mirror Glasses or Mirrors	None	None	None	None
Total Number of Vehicles	None	None	None	None
Total Number of Additional Mirrors	None	None	None	None
Cost of Additional Mirror Glasses or Mirrors	£0.00	£0.00	£0.00	£0.00
Cost of Labour @ £25 each	£0.00	£0.00	£0.00	£0.00
Total Maintenance Cost	£0.00	£0.00	£0.00	£0.00
Annual Maintenance Cost	£0.00	£0.00	£0.00	£0.00

Option 2 - Annual Maintenance Cost for Each Vehicle Type				
Vehicle Type	3.5 to 7.5 tonnes	7.5 to 12 tonnes	Over 12 tonnes	All Vehicles
Number of Additional Mirror Glasses or Mirrors	2	1	None	
Total Number of Vehicles	19,500	7,200	None	26,700
Total Number of Additional Mirrors	39,000	7,200	None	46,200
Cost of Additional Mirrors @ £286.00 each	£4,602,000.00	£849,600.00	£0.00	£5,451,600.00
Cost of Labour @ £25.00 each	£487,500.00	£90,000.00	£0.00	£577,500.00
Total Maintenance Cost	£5,089,500.00	£939,600.00	£0.00	£6,029,100.00
Annual Maintenance Cost	£424,125.00	£78,300.00	£0.00	£502,425.00

Option 3 - Annual Maintenance Cost for Each Vehicle Type				
Vehicle Type	3.5 to 7.5 tonnes	7.5 to 12 tonnes	Over 12 tonnes	All Vehicles
Number of Additional Mirror Glasses or Mirrors	1	1	1	
Total Number of Vehicles	19,500	7,200	181,200	207,900
Total Number of Additional Mirrors	19,500	7,200	181,200	207,900
Cost of Additional Mirrors @ £105.00 each	£1,023,750.00	£378,000.00	£9,513,000.00	£10,914,750.00
Cost of Labour @ £25.00 each	£243,750.00	£90,000.00	£2,265,000.00	£2,598,750.00
Total Maintenance Cost	£1,267,500.00	£468,000.00	£11,778,000.00	£13,513,500.00
Annual Maintenance Cost	£105,625.00	£39,000.00	£981,500.00	£1,126,125.00

Option 4 - Annual Maintenance Cost for Each Vehicle Type				
Vehicle Type	3.5 to 7.5 tonnes	7.5 to 12 tonnes	Over 12 tonnes	All Vehicles
Number of Additional Mirror Glasses or Mirrors	None	1	1	
Total Number of Vehicles	None	7,200	181,200	188,400
Total Number of Additional Mirrors	None	7,200	181,200	188,400
Cost of Additional Mirrors @ £70.00 each	£0.00	£238,000.00	£6,342,000.00	£6,580,000.00
Cost of Labour @ £25.00 each	£0.00	£90,000.00	£2,265,000.00	£2,355,000.00
Total Maintenance Cost over 12 yrs	£0.00	£328,000.00	£8,607,000.00	£8,935,000.00
Annualised Maintenance Cost	£0.00	£27,333.33	£717,250.00	£744,583.33

Option 5 - Annual Maintenance Cost for Each Vehicle Type				
Vehicle Type	3.5 to 7.5 tonnes	7.5 to 12 tonnes	Over 12 tonnes	All Vehicles
Number of Additional Mirror Glasses or Mirrors	2	2	1	
Total Number of Vehicles	19,500	7,200	181,200	207,900
Total Number of Additional Mirrors	39,000	14,400	181,200	234,600
Average Cost of Additional Mirrors @ £197.00 each	£4,602,000.00	£1,087,600.00	£6,342,000.00	£12,031,600.00
Cost of Labour @ £25.00 each	£487,500.00	£180,000.00	£2,265,000.00	£2,932,500.00
Total Maintenance Cost	£5,089,500.00	£1,267,600.00	£8,607,000.00	£14,964,100.00
Annual Maintenance Cost	£424,125.00	£105,633.33	£717,250.00	£1,247,008.33

Option 6 - Annual Maintenance Cost for Each Vehicle Type				
Vehicle Type	3.5 to 7.5 tonnes	7.5 to 12 tonnes	Over 12 tonnes	All Vehicles
Number of Additional Mirror Glasses or Mirrors	3	4	4	
Total Number of Vehicles	19,500	7,200	181,200	207,900
Total Number of Additional Mirrors	58,500	28,800	724,800	812,100
Average Cost of Additional Mirrors @ £197.00 each	£4,475,250.00	£2,203,200.00	£55,447,200.00	£62,125,650.00
Cost of Labour @ £25.00 each	£731,250.00	£360,000.00	£9,060,000.00	£10,151,250.00
Total Maintenance Cost	£5,206,500.00	£2,563,200.00	£64,507,200.00	£72,276,900.00
Annual Maintenance Cost	£433,875.00	£213,600.00	£5,375,600.00	£6,023,075.00

ANNEX 4 – TOTAL ANNUAL COST FOR EACH MEASURE AND VEHICLE TYPE

5.7 Total Costs

Option 1 - The cost is assumed to be zero and is the baseline for all calculations.

Option 1 - Total Annual Cost for Each Vehicle Type					
Vehicle Type	Installation Cost	Installation Cost Per Annum	Operating Cost Per Annum	Maintenance Cost Per Annum	Total Annual Cost
3.5 to 7.5 tonnes	£0.00	£0.00	£0.00	£0.00	£0.00
7.5 to 12 tonnes	£0.00	£0.00	£0.00	£0.00	£0.00
Over 12 tonnes	£0.00	£0.00	£0.00	£0.00	£0.00
All Vehicles	£0.00	£0.00	£0.00	£0.00	£0.00

Option 2 - Makes allowance for the increased purchase and operating costs for the adoption of the measures within the EC proposal with replacement mirror glasses, replacement mirrors and additional mirrors where they are not original equipment as follows:

Option 2 - Total Annual Cost for Each Vehicle Type					
Vehicle Type	Installation Cost	Installation Cost Per Annum	Operating Cost Per Annum	Maintenance Cost Per Annum	Total Annual Cost
3.5 to 7.5 tonnes	£11,154,000.00	£929,500.00	£175,525.00	£424,125.00	£1,529,150.00
7.5 to 12 tonnes	£3,465,000.00	£288,750.00	£30,975.00	£78,300.00	£398,025.00
Over 12 tonnes	£70,758,600.00	£5,896,550.00	£0.00	£0.00	£5,896,550.00
All Vehicles	£85,377,600.00	£7,114,800.00	£206,500.00	£502,425.00	£7,823,725.00

Option 3 - Makes allowance for the increased purchase and operating costs for the adoption of supplementary dead angle mirrors as follows:

Option 3 - Total Annual Cost for Each Vehicle Type					
Vehicle Type	Installation Cost	Installation Cost Per Annum	Operating Cost Per Annum	Maintenance Cost Per Annum	Total Annual Cost
3.5 to 7.5 tonnes	£3,022,500.00	£251,875.00	£0.00	£105,625.00	£357,500.00
7.5 to 12 tonnes	£1,116,000.00	£93,000.00	£0.00	£39,000.00	£132,000.00
Over 12 tonnes	£28,086,000.00	£2,340,500.00	£0.00	£981,500.00	£3,322,000.00
All Vehicles	£32,224,500.00	£2,685,375.00	£0.00	£1,126,125.00	£3,811,500.00

Option 4 - Makes allowance for the increased purchase and operating costs for the adoption of class VI front mirrors as follows:

Option 4 - Total Annual Cost for Each Vehicle Type					
Vehicle Type	Installation Cost	Installation Cost Per Annum	Operating Cost Per Annum	Maintenance Cost Per Annum	Total Annual Cost
3.5 to 7.5 tonnes	£0.00	£0.00	£0.00	£0.00	£0.00
7.5 to 12 tonnes	£864,000.00	£72,000.00	£30,975.00	£27,333.33	£130,308.33
Over 12 tonnes	£21,744,000.00	£1,812,000.00	£846,650.00	£717,250.00	£3,375,900.00
All Vehicles	£22,608,000.00	£1,884,000.00	£877,625.00	£744,583.33	£3,506,208.33

Option 5 - Makes allowance for the increased purchase and operating costs for the adoption of the measures within the EC proposal, as detailed in Option 2, plus adoption of a front mirror system, as detailed in option, 4 as follows:

Option 5 - Total Annual Cost for Each Vehicle Type					
Vehicle Type	Installation Cost	Installation Cost Per Annum	Operating Cost Per Annum	Maintenance Cost Per Annum	Total Annual Cost
3.5 to 7.5 tonnes	£11,154,000.00	£929,500.00	£175,525.00	£424,125.00	£1,529,150.00
7.5 to 12 tonnes	£4,329,000.00	£360,750.00	£61,950.00	£105,633.33	£528,333.33
Over 12 tonnes	£92,502,600.00	£7,708,550.00	£846,650.00	£717,250.00	£9,272,450.00
All Vehicles	£107,985,600.00	£8,998,800.00	£1,084,125.00	£1,247,008.33	£11,329,933.33

Option 6 - Makes allowance for the increased purchase and operating costs for the adoption of the mirror requirements in Directives 2003/97/EC and 2005/27/EC as follows:

Option 6 - Total Annual Cost for Each Vehicle Type					
Vehicle Type	Installation Cost	Installation Cost Per Annum	Operating Cost Per Annum	Maintenance Cost Per Annum	Total Annual Cost
3.5 to 7.5 tonnes	£19,656,000.00	£1,638,000.00	£351,050.00	£433,875.00	£2,422,925.00
7.5 to 12 tonnes	£8,121,600.00	£676,800.00	£92,925.00	£213,600.00	£983,325.00
Over 12 tonnes	£204,393,600.00	£17,032,800.00	£1,621,025.00	£5,375,600.00	£24,029,425.00
All Vehicles	£232,171,200.00	£19,347,600.00	£2,065,000.00	£6,023,075.00	£27,435,675.00

ANNEX 5 – BENEFIT / COST SUMMARY FOR EACH MEASURE AND VEHICLE TYPE

11. Summary and recommendations

Option 1 - Is considered to have no benefits or costs, but there would be cost implications if the UK were involved in infraction proceedings as a result of non-compliance with the Directive.

Option 1 - Benefit / Cost Summary			
Vehicle Type	Total benefit per Annum: Economic, Environmental, Social	Total Cost per Annum: Economic, Environmental, Social - Policy and Administrative	Benefit / Cost Ratio
3.5 to 7.5 tonnes	£0.00	£0.00	N/A
7.5 to 12 tonnes	£0.00	£0.00	N/A
Over 12 tonnes	£0.00	£0.00	N/A
All Vehicles	£0.00	£0.00	N/A

Option 2 - Benefit / Cost Summary			
Vehicle Type	Total benefit per Annum: Economic, Environmental, Social	Total Cost per Annum: Economic, Environmental, Social - Policy and Administrative	Benefit / Cost Ratio
3.5 to 7.5 tonnes	£1,003,761.00	£1,529,150.00	0.7:1
7.5 to 12 tonnes	£334,587.00	£398,025.00	0.8:1
Over 12 tonnes	£9,814,552.00	£5,896,550.00	1.7:1
All Vehicles	£11,152,900.00	£7,823,725.00	1.4:1

Option 3 - Benefit / Cost Summary			
Vehicle Type	Total benefit per Annum: Economic, Environmental, Social	Total Cost per Annum: Economic, Environmental, Social - Policy and Administrative	Benefit / Cost Ratio
3.5 to 7.5 tonnes	£1,003,761.00	£357,500.00	2.8:1
7.5 to 12 tonnes	£334,587.00	£132,000.00	2.5:1
Over 12 tonnes	£9,814,552.00	£3,322,000.00	2.9:1
All Vehicles	£11,152,900.00	£3,811,500.00	2.9:1

Option 4 - Benefit / Cost Summary			
Vehicle Type	Total benefit per Annum: Economic, Environmental, Social	Total Cost per Annum: Economic, Environmental, Social - Policy and Administrative	Benefit / Cost Ratio
3.5 to 7.5 tonnes	N/A	N/A	N/A
7.5 to 12 tonnes	£267,669.60	£130,308.33	2.1:1
Over 12 tonnes	£7,851,641.60	£3,375,900.00	2.3:1
All Vehicles	£8,119,311.20	£3,506,208.33	2.3:1

Option 5 - Benefit / Cost Summary			
Vehicle Type	Total benefit per Annum: Economic, Environmental, Social	Total Cost per Annum: Economic, Environmental, Social - Policy and Administrative	Benefit / Cost Ratio
3.5 to 7.5 tonnes	£1,003,761.00	£1,529,150.00	0.7:1
7.5 to 12 tonnes	£653,126.00	£528,333.33	1.2:1
Over 12 tonnes	£17,637,630.00	£9,272,450.00	1.9:1
All Vehicles	£19,294,517.00	£11,329,933.33	1.7:1

Option 6 - Benefit / Cost Summary			
Vehicle Type	Total benefit per Annum: Economic, Environmental, Social	Total Cost per Annum: Economic, Environmental, Social - Policy and Administrative	Benefit / Cost Ratio
3.5 to 7.5 tonnes	£1,003,761.00	£2,422,925.00	0.4:1
7.5 to 12 tonnes	£653,126.00	£983,325.00	0.7:1
Over 12 tonnes	£17,637,630.00	£24,029,425.00	0.7:1
All Vehicles	£19,294,517.00	£27,435,675.00	0.7:1

ANNEX 6 – COMPETITION ASSESSMENT

The competition filter below provides an indication of whether the proposal would risk a negative effect on competition.

Q1. In the market(s) affected by the new regulation, does any firm have more than a 10% market share?	YES
Q2. In the market(s) affected by the new regulation, does any firm have more than a 20% market share?	NO
Q3. In the market(s) affected by the new regulation, do the largest three firms together have at least a 50% market share?	NO
Q4. Would the costs of the regulation affect some firms substantially more than others?	NO
Q5. Is the regulation likely to affect the market structure, changing the number or size of firms?	NO
Q6. Would the regulation lead to higher set up costs, for new or potential firms, that existing firms do not have to meet?	NO
Q7. Would the regulation lead to higher ongoing costs, for new or potential firms, that existing firms do not have to meet?	NO
Q8. Is the market characterised by rapid technological change?	NO
Q9. Would the regulation restrict the ability of firms to choose the price, quality, range or location of their products?	YES. But only insofar as mirrors, which are currently supplied as an option, would need to be supplied on a mandatory basis.

It is concluded from the above that there is unlikely to be a negative competitive impact from the regulation.