**EXPLANATORY MEMORANDUM TO**

**THE MOTOR VEHICLES (EC TYPE APPROVAL) (AMENDMENT No.3) REGULATIONS 2006**

**2006 No. 2409**

**1.** This explanatory memorandum has been prepared by the Vehicle Certification Agency, an Executive Agency of the Department for Transport, and is laid before Parliament by Command of Her Majesty.

## 2. Description

These Regulations amend the Motor Vehicles (EC Type-Approval) Regulations 1998 ("the 1998 Regulations"), in order to implement, for the purposes of the type approval of light passenger vehicles, Directive 2005/66/EC relating to Frontal Protection Systems.

## 3. Matters of special interest to the Joint Committee on Statutory Instruments

None.

## 4. Legislative Background

4.1 This legislation implements Directive 2005/66/EC relating to Frontal Protection Systems.

4.2 Directive 70/156/EEC provides for a system of vehicle type approval. Light passenger vehicles (i.e. passenger vehicles with no more than 8 seats, referred to in Directive 70/156/EEC as Category M1) must be of a type approved as conforming to this Directive before being registered, sold or entered into service for the first time. In order to be so approved, a vehicle must comply with technical requirements specified in other Directives, called the "Separate Directives", listed in an Annex to Directive 70/156/EEC.

4.3 Directive 2005/66/EC (listed in paragraph 2) is added as one of one of the Separate Directives listed in this Annex in order to update the technical requirements.

4.4 It is a requirement of the EC type approval system that transposition of this Directive must be carried out.

4.5 The 1998 Regulations implement Directive 70/156/EEC in respect of light passenger vehicles, and the related Separate Directives.

4.6 Like the 1998 Regulations, these Regulations are made under the powers conferred by section 2(2) of the European Communities Act 1972.

## 5. Extent

This instrument extends to all of the United Kingdom.

## 6. European Convention on Human Rights

As the instrument is subject to negative resolution procedure and does not amend primary legislation, no statement is required.

## 7. Policy background

7.1 As a member State of the European Union, the UK is required to transpose the type approval requirements as specified by Directive 70/156/EEC and the Separate Directives. These requirements are constantly being refreshed with amending Directives.

7.2 Directive 2005/66/EC makes requirements that a frontal protection system, sometimes known as a 'bull bar', whether fitted to a vehicle as original equipment or marketed as a separate technical unit, shall comply with a set of technical standards for both construction and installation. This is associated with initiatives of the European Parliament and of the Council to ensure the protection of pedestrians and other vulnerable road users in the event of a collision with a motor vehicle, which had earlier been reflected in the adoption of Directive 2003/102/EC on the subject of Pedestrian Protection.

7.3 By inserting a reference to this Directive in the appropriate place in a Schedule to the 1998 Regulations, these Regulations ensure that it will be taken into account as far as the type approval of light passenger vehicles is concerned.

7.4 Although implementation of this Directive is mandatory, it has become usual to advise the United Kingdom's automotive industry of the necessary changes and ask their opinions. Representatives of the Industry participate actively in the development of European legislation, and close contact has been maintained during the decision-making process that led to the adoption of the Directives. Following this practice, a notification letter was sent by the Vehicle Certification Agency on 19th January 2006 to the Society of Motor Manufacturers and Traders (SMMT) in order to advise of the imminent transposition and to invite any comment. They have made no response.

## 8. Impact

8.1 There will be an impact on the costs to businesses as a result of the measures contained in this SI, which is detailed in the Regulatory Impact Assessment attached.
8.2 There will be no impact on the public sector.

## 9 Contact

Gus Gander of the Vehicle Certification Agency of the Department for Transport, 1 Eastgate Office Centre, Eastgate Road, Bristol BS5 6XX (Tel: 01179 524119; e-mail ggander@vca.gov.uk) can answer questions regarding this instrument.

## TRANSPOSITION NOTE

To accompany the Motor Vehicles (EC Type Approval) (Amendment No. 3) Regulations 2006, amending the Motor Vehicles (EC Type Approval) Regulations 1998 ("the 1998 Regulations"), to implement Directive 2005/66/EC relating to the use of frontal protection systems and amending Directive 70/156/EEC on type approval.

Commission Directive 2005/66/EC, relating to the use of frontal protection systems.

| | Objectives | Implementation | Responsibility |
|---|---|---|---|
| Article 3, Annexes I and II | Requires that a frontal protection system be approved to certain technical requirements, and that light passenger vehicles fitted with frontal protection systems only receive EC type approval if such systems comply with such requirements. | Regulation 3 adds this Directive to the table in Schedule 1 to the 1998 Regulations, which lists requirements to be met for light vehicles, and equipment intended for use on light vehicles, to obtain type-approval in the UK. | The Secretary of State. |
| Article 6 | Amends Directive 70/156/EEC on the type approval of motor vehicles and their trailers, to implement the above requirements | Regulation 2 amends the definition of "the Framework Directive" in the 1998 Regulations, so that it is read as amended by Directive 2005/66/EC | Ditto. |

## Final Regulatory Impact Assessment

## 1 Title

**Implementation into the Motor Vehicles (EC Type Approval) Regulations 1998 of Directive 2005/66/EC of the European Parliament and the Council relating to the use of Frontal Protection Systems ('bull bars') on motor vehicles and amending council directive 70/156/EEC.**

## 2 Purpose and Intended Effect of Measure

i) The Objective:

To introduce objective performance standards for Frontal Protection Systems[1] (FPS) with the purpose of reducing the potential for vulnerable road users to be killed or seriously injured in collisions.

The Directive is mandatory and applies to all Member States.

This Regulatory Impact Assessment (RIA) only considers the effect of the legislation in Great Britain with regard to EC type approval of new motor vehicles or components. A subsequent RIA will deal with the implementation of the Directive into other legal instruments relating to in-use standards and enforcement.

ii) The Background

Vulnerable road users, especially pedestrians and cyclists, represent a significant proportion of the road casualties in the European Union each year. For 2005, in the UK, pedestrian casualties accounted for some 20% of all those killed or seriously injured on our roads. Research into the injury mechanisms associated with these casualties has provided an understanding of how to assess a vehicle's potential to inflict injuries and thus to establish performance parameters that promote safer vehicles. Based upon this research, legislative measures have been developed that require changes to the design of the fronts of passenger cars and certain types of van.

The first measure was the adoption of a Pedestrian Protection Directive (2003/102/EC); this has applied to new cars and light vans type-approved since October 2005. The initial phase of the Directive applies to both cars and car derived vans weighing up to 2,500kg. However, it does not apply to frontal protection systems (e.g. 'bull bars') which may be fitted to the vehicle after registration or to frontal protection systems when fitted from new to vehicles of higher mass. Nonetheless, as part of the negotiation for improved protection for vulnerable road users, the motor manufacturers' associations made a voluntary commitment, that, from January 2002, they would not fit FPS devices of a 'rigid' nature to new cars or light vans.

[1] 'Frontal Protection System' is defined in the Directive as 'a separate structure or structures, such as a bull bar or a supplementary bumper, which is intended to protect the external surface of the vehicle, above and/or below the original-equipment bumper, from damage in the event of a collision with an object. Structures, with a maximum mass of less than 0.5 kg, intended to protect only the lights, are excluded from this definition.'

To ensure the benefits of the Pedestrian Protection Directive are not compromised by the fitting of a frontal protection system, a separate Directive (2005/66/EC) has been agreed that includes complimentary requirements designed to maintain the required level of pedestrian protection. This Directive applies to new designs of vehicle up to 3.5 tonnes that are equipped with a frontal protection system and also to frontal protection systems that are produced for sale as aftermarket accessories. The Directive comes into effect on 26 August 2006 and requires all new vehicles or FPS placed on the market to comply with the requirements from 25 May 2007.

iii) Rational for Government intervention and Risk Assessment

In 2005 3,201 people were killed, and 28,954 seriously injured on the roads of Great Britain. Pedestrian casualties accounted for 671 deaths and 6,458 serious injuries. Aggressive FPS on vehicles can increase the risk of serious injury and death to pedestrians and other vulnerable road users.

Research conducted for the Department for Transport, based on police accident reports from 1994, estimated that 2 or 3 additional fatalities, and about 40 additional serious casualties resulted from collisions with vehicles equipped with FPS. However, these figures may be viewed in relation to the base vehicles existing at the time of that research. These were more aggressive to pedestrians than new vehicles that comply with the requirements of the Pedestrian Protection Directive. Fitting a rigid metal device to the front of such a vehicle would, in comparative terms, represent a greater hazard than the same device fitted to a non-compliant vehicle and therefore the number of deaths and serious injuries occurring as a result of fitting an FPS are likely to increase if no action is taken.

The Commission proposal for the Frontal Protection System Directive was issued in late 2003 and was subject to agreement by the European Parliament and the Council of Ministers. The Directive includes specifications which, when applied to new vehicle types, will deliver equivalent levels of safety as those provided by the Pedestrian Protection Directive but also includes alternative provisions applicable to systems intended to be fitted to earlier or heavier vehicles that are not subject to the Pedestrian Protection Directive.

## 3 Consultation

i) Within Government

The Directive was subject to the Parliamentary Scrutiny procedure at the Proposal Stage, and Explanatory Memoranda were circulated to relevant stakeholders within government.

ii) Public Consultation

A 1997 national consultation looked at four options, including:

1. Encouraging voluntary non-fitment and removal of FPS
2. Banning all non-approved metal FPS
3. Allowing only type-approved or 'non-aggressive' FPS
4. Allowing only type approved FPS or those which had been proved to be less aggressive than the base vehicle.

It was subsequently decided that a variation of the third option, incorporated within the European vehicle type-approval system, represented the best way forward. When the Commission proposal was put forward in late 2003, a further consultation exercise was carried out in order to obtain updated information of the financial implications of the proposal. This included the manufacturers involved in the 1997 consultation and additional manufacturers who expressed an interest. Feedback from this consultation, and in particular some generic cost information, has been used in the preparation of this RIA. Discussions on feasibility issues continued with representatives of vehicle and component manufacturers throughout the negotiation process.

Following the publication of the Directive efforts were made through further informal consultation to confirm the current size of the market for frontal protection systems in the UK. No UK manufacturers could be traced through contact with the SMMT (Society of Motor Manufacturers and Traders), internet searches, or examining the technical press. Therefore the latest information is based on comments received from only a couple of after-market suppliers of frontal protection systems who responded to enquiries.

As transposition of this Directive is mandatory, there has been no formal consultation, there being no alternative to this course of action. The SMMT were notified in April this year of this intention, and have made no comment.

## 4 Options

This is a mandatory directive which the UK is obliged to implement into their national legislation, therefore, in practice there are no options. However, to facilitate the calculation of real costs and benefits of the Directive two options have been examined for comparative purposes:

Option 1 No Action - the Directive is not implemented, but it is assumed that the manufacturer' commitment not to fit 'rigid' FPS on new vehicles from 2002 will be honoured.

Option 2 The Department meets its obligations to implement the Directive into Motor Vehicles (EC Type Approval) Regulations 1998 and the provisions are adequately enforced.

## 5 Costs and Benefits

Sectors and groups affected

This Directive will affect car and light van manufacturers who sell into the UK or wider European market, and component manufacturers who sell either to vehicle manufacturers or to the after-market. It may also affect some business users (such as those who use vehicles for forestry/agricultural activities and may derive some benefit from the protection that traditional rigid FPS offers). However, many of the vehicles used by this sector are likely to be larger goods vehicles or agricultural vehicles which are not affected by this Directive.

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

**Benefits**

Economic

The UK has a potential market leader in that at least one UK manufacturer is known to have developed a non-rigid FPS that has been demonstrated to comply with the requirements of the FPS Directive.

**Option 1** – may result in some reduction in risk to people struck by post 2002 cars and light vans which have not had after-market FPS fitted. However, as the protection offered to vulnerable road users by base vehicles improves, the effect of fitting non-compliant retrofit FPS will be to dilute those safety gains.

**Option 2** - would prevent non-compliant devices from being type approved for use on cars and light vans, and lead to a greater reduction in the numbers of pedestrians killed and injured in accidents. It should ensure that the safety of Pedestrian Protection Directive (PPD) compliant vehicles is not compromised by the fitting of a frontal protection system, and may actually improve the pedestrian safety of non-PPD compliant vehicles. The estimated annual **increase in benefits**, in comparison with Option 1, is around **£3,616,000**.

Social

**Option 2** will yield considerable benefits in terms of reducing the distress and hardship related to the injury and loss of life caused by aggressive bull bars.

Environmental

Neither option has any significant environmental benefit

**Costs**

Economic

Information received from the 2003 consultation exercise (see section 3) suggested that there were about 48,000 systems fitted to new or existing vehicles each year, and it was noted that this figure had been falling as many of the smaller manufacturers, anticipating regulations in this area, had diversified into other markets. The most recent informal consultation suggests that this figure has reduced further, and it is now estimated that about 25,000 rigid systems and a further 5,000 non-rigid systems are fitted to new or existing vehicles each year.

The recent informal consultation also suggested that there are only 6 UK manufacturers of rigid-FPS, with up to 100 jobs linked to their manufacturer. However, the vast majority of FPS are understood to be imported from either other European countries or the Far East.

**Option 1** is assumed to involve **no additional costs**. The agreement by manufacturers not to supply 'rigid' FPS on new vehicles is already in place, and involves no mandatory test or approval requirements.

**Option 2** will involve development, testing and approval **costs of around £109,000** per year, as indicated in Annex B. It is assumed that the material costs per component will remain unchanged.

Environmental

No significant environmental implications arise from either option.

Social

No significant social costs arising from either option. It is assumed that any changes in employment due to the move from metal manufacturing technologies to plastic moulding technologies will be a gradual process (which is already under way) so there are unlikely to be any significant employment implications.

## 6 Small Firms Impact Test

Because of the relatively high cost of testing and approval to the new requirements, this Directive is likely to have a greater effect on small manufacturers supplying the after-market rather than larger manufacturers supplying higher volumes; normally to the original vehicle manufacturer. It is understood that many smaller manufacturers have already transferred activity to products having similar manufacturing requirements, roll bars for example. Some small businesses that have replied to the 2003 consultation indicated that they would move out of this area of business altogether. The recent informal consultation suggests that only 6 UK manufacturers of FPS remain, with about 100 jobs linked to the production of FPS. It has not been possible to identify those manufacturers in order to contact them to determine whether those jobs will be redistributed, or lost.

## 7 Competition Assessment

A competition assessment has not indicated any significant competition implications.

**Option 1** will have no impact on competition as the status quo will be maintained.

**Option 2** will have an impact on manufacturers of rigid FPS. These FPS are typically manufactured from steel using traditional fabrication techniques, that are ideally suited to low-volume manufacturer. It is unlikely that FPS manufactured using such materials and technologies will be able to comply with the new provisions. It is anticipated that only FPS employing synthetic materials will be able to comply. To manufacture such FPS would involve high design and manufacturing investment and it is anticipated that metal fabricators producing FPS in low-volume will withdraw from this market segment altogether. However, assuming that there will still be a constant demand for frontal protection systems, this lost market share should be picked up by manufacturers with advanced component design and manufacturing expertise, employing processes such as rotational moulding, or medium-high volume manufacturers willing to invest in such technology. At least one UK manufacturer is know to have been investing heavily in developing a product to comply with the FPS Directive, and has the potential to become a market leader with this product under Option 2.

## 8 Enforcement, Sanctions and Monitoring

For new vehicles and for accessories marketed by the vehicle manufacturer, enforcement will be through the European type-approval procedure. Approved FPS will be marked with an approval mark, allowing easy identification of compliant FPS.

For after-market FPS intended for retro-fitting to existing vehicles, and vehicle not covered by the European type approval procedure, alternative enforcement provisions will be introduced, which will be the subject of another RIA. It is anticipated that these provisions will include: new provisions under the Consumer Protection Act 1987 to regulate the sale of FPS as separate technical units; amendments to the Road Vehicles (Construction and Use) Regulations 1986 to prohibit the use on the road of new vehicles unless the any FPS fitted is compliant; amendments to the Motor Vehicles (Approval) Regulations 2001 to address vehicles not covered by European type-approval; and, inclusion of a simple check into the annual vehicle inspection test (MOT). Enforcement of these various aspects will normally be by trading standards officers, the police, and vehicle inspectors respectively

The Department for Transport continually carries out accident analysis via studies such as the 'On the Spot' accident study which identifies accident and injury patterns. These and other studies would enable us to monitor the effect of the changes by identifying any long term changes in accident risk due to improved standards for pedestrian protection.

## 9 Implementation and Delivery Plan

For the approval of Frontal Protection Systems (FPS) fitted as part of a new vehicle or supplied as separate technical units for fitting in the after-market, implementation will be by means of changes to the vehicle Type Approval Regulations, which are enforced in the UK by the Vehicle Certification Agency. From 25 November 2006 it will not be possible to type- approve:

a) a new car or light van subject to mandatory Type Approval requirements which is fitted with a frontal protection system or

b) an FPS as a separate technical unit,

unless the FPS meets the requirements of the Directive.

From 25 May 2007 it will be expected that any new car or light van which is fitted with a frontal protection system can only be registered if any FPS fitted to it meets the requirements of the Directive.

For after-market supply and fitting of Frontal Protection Systems, implementation will be by means of changes to other legislation, such as the Road Vehicles (Construction and Use) Regulation 1986 and the Consumer Protection Act 1987.

From 25 May 2007, the supply of an FPS or the fitting of an FPS to a new vehicle would be prohibited unless the FPS meets the requirements of the Directive.

Implementation of these provisions will be the subject of separate legal instruments and a separate RIA.

## 10 Post-Implementation Review

Article 5 of the Directive requires the European Commission to review the technical provisions of the Directive not later than 25 August 2010, to establish whether any modifications are appropriate.

## 11 Summary

### Costs

The total additional annual costs to the manufacturer from the two options discussed, assuming annual sales of FPS (Original Equipment and After-Market combined) of 30,000, are as follows:

### Option 1

No additional cost

### Option 2

**Additional costs** for production and approval of compliant frontal protection systems are anticipated to be in the region of around **£109,000** per year. Whilst these costs have to be met by the manufacturer in the first instance, it is expected that they will be passed onto the consumer in the purchase cost of the compliant FPS.

### Benefits

### Option 1

Assuming buying trends continue as today, that is that non-compliant FPS are available in the market and are fitted at a rate of approximately 30,000 units per year, it is estimated that by 2017 there will be a **negative benefit,** in terms of casualties, of around **£2,885,000 per year.**

### Option 2

Compared to a situation where no vehicles in the whole fleet are fitted with an FPS, Option 2 (i.e. compliant FPS being fitted to 30,000 vehicles each year) is likely to lead to **increased casualty benefits** of costs of around **£731,000** per year by 2017.

Compared to Option 1 this represents an **increased benefit** of about **£3,616,000**.

Details of the benefits associated with the two options are given in Annex A.

**Summary Costs and benefits table (assuming full implementation by 2017)**

| | Annual cost £000 | Annual benefit £000 (compared with no FPS fitted) | Cost/benefit ratio |
|---|---|---|---|
| **Option 1 No Directive. New original equipment FPS meet voluntary 'non-rigid' standard but no control on aftermarket FPS** | 0 | -2,885 | |
| **Option 2 Accept Directive proposal in full** | 109 | 731 | |
| **Cost and benefit of Option 2 compared with option 1** | 109 | 3,616 | 1:33 |

## 12. Recommendation

Option 2: This will ensure that we meet our obligations under EU law and will represent a significant benefit over costs.

## 13. Declaration

I have read the regulatory impact assessment and I am satisfied that the benefits justify the costs.

**Signed** G Merron

**Date** 5th September 2006

**Gillian Merron**
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## ANNEX A - Benefits

### Estimated casualty savings from various levels of frontal protection system/vehicle compliance.

Estimates for the number of casualties saved by improving frontal protection system (FPS) designs are complex, since the level of pedestrian protection offered by vehicles has been improving over a number of years, leading up to the advent of the pedestrian protection directive. This process will continue, as improved pedestrian protection will be required in the future. In addition the vehicle industry have given commitments concerning the types of FPS they would or would not make available. The consequence of these aspects mean that over the coming years there will be vehicles on the road with varying levels of pedestrian protection, and FPS of varying ages. Some of these will meet the proposed standards, some will meet the 'non-rigid' voluntary standard and some will meet no standard at all.

### Assumptions

1) Every 'rigid' non-conforming frontal protection system fitted to a conventional vehicle front (i.e., one not meeting the pedestrian protection Directive) incurs a **casualty penalty of £11 per FPS/year** (Source: TRL analysis[2])

2) Every Pedestrian Protection Directive phase 1 (PPD) compliant vehicle will represent a **saving in casualties of £7.20 per FPS/year** compared with a non PPD compliant vehicle,
   - **£1.24** of this saving is attributed to the reduction in **fatalities**
   - **£5.96** of this saving is attributed to the reduction in **serious injuries**

   (Source: DfT RIA for Pedestrian Protection)

3) A non-rigid (industry agreement) frontal protection system is assumed to
   - have a **neutral effect** when fitted to a non-PPD vehicle,
   - suffer a **penalty of £7.20 per FPS/year** when fitted to a PPD vehicle.

4) A frontal protection system which is compliant to the FPS Directive and fitted to a vehicle meeting the PPD is assumed to have the **same head and leg injury prevention characteristics** as the base vehicle.

5) A frontal protection system which is compliant to the parts of the FPS Directive which relate to FPS intended to be fitted to non-PPD vehicles will have the following protective effect.
   - <u>for the head</u>, the number of **casualties saved would be 50%** of those that would be saved if the vehicle met the PPD, as the FPS would not cover those parts of the head test area on the bonnet top and the criteria are lower,
   - <u>for the leg</u>, **no saving** will be made compared with the base vehicle. This is a slightly pessimistic assumption since it is likely there will be some casualty savings, but has been made to simplify the calculations.

[2] A study of accidents involving bull bar equipped vehicles. (TRL report 243. Transport Research Laboratory ,1996)

6) **100% of fatal injuries and two thirds of serious injuries are to the head** of pedestrians involved in an accident with an FPS equipped vehicle. (Source: MIRA report [3])

7) The scope of the pedestrian protection directive remains unchanged, and vehicles are assumed to last for 10 years.

8) Of 30,000 FPS supplied per year, 5,000 are supplied as original equipment (OE) with the vehicle (either fitted on-line or as a dealer-fit option) and 25,000 are after-market. (Source: informal consultation in 2006, and EC Summary Report [4])

9) 80% of the FPS supplied as original equipment or fitted in the aftermarket are for vehicles above 2.5 tonnes and 20% for vehicles up to 2.5 tonnes (Source: data from SVA scheme).

10) After-market FPS are added when the vehicle is less than 4 years old (average age 2 years) and last for 10 years. (FPS may be transferred to another vehicle when the vehicle is scrapped).

11) The **demand for FPS will remain constant, with 'rigid' non- compliant FPS being replaced by 'non-rigid' compliant FPS**.

12) By 2017 the FPS Directive is fully implemented, i.e. the vast majority of non-compliant FPS have either been removed from vehicles and scrapped or scrapped with the vehicle to which they are fitted.

13) No vehicles exceeding 2.5 t comply with the pedestrian protection directive, since they are outside of the scope of the Directive.

[3] Study of Research into Pedestrian Protection (MIRA report 97-456502-01, 1997) carried out on behalf of the European Commission
[4] Pedestrian Protection Industry Commitment - 2004 Reports Summary by the European Commission

## Calculations

Based upon the above assumptions, Table 1 below indicates the savings that can be gained from various combinations of frontal protection system and base vehicle.

**Table 1**
**Estimates (£) of casualty cost per frontal protection system equipped vehicle per year, compared with baseline same vehicle without frontal protection system fitted. (-ve values indicate cost savings.)**

| | | Type of FPS fitted to base vehicle | | |
|---|---|---|---|---|
| | | **Standard 'rigid'** | **ACEA agreement 'non-rigid'** | **Directive Compliant 'non-rigid'** |
| **Base Vehicle** | **Non-PPD** | 11.00 [5] | 0.00 [6] | -2.60 [7] |
| | **PPD** | 18.20 [8] | 7.20 [6] | 0.00 [9] |

Using the figures in the Table 1, above, the relevant casualty costs per vehicle/FPS combination per year can be determined for the two options, as in Table 2, below.

**Table 2 - Additional Casualty Cost (£) per year per frontal protection system equipped vehicle compared with same vehicle without frontal protection system (-ve values indicate cost savings)**

| **Configuration of FPS by base vehicle** | | **Option 1** | **Option 2** |
|---|---|---|---|
| **OE FPS fitted on a new …** | **non-PPD vehicle** | 0.00 | -2.60 |
| | **PPD vehicle** | 7.20 | 0.00 |
| **Retrofit FPS fitted to a …** | **non-PPD vehicle** | 11.00 | -2.60 |
| | **PPD vehicle** | 18.20 | 0.00 |

By factoring in the vehicle and frontal protection system numbers expected to be in use when the Directive is fully implemented in the fleet, overall estimates of casualty cost savings can be made. However, the relative risk of FPS vs the base vehicle largely depends on whether the base vehicle meets pedestrian protection requirements.

Table 3, below, gives estimates of the penetration of PPD compliant vehicles within the fleet, and the associated mix of FPS types.

[5] See assumption 1
[6] See assumption 3
[7] Derived from assumptions 2, 5 & 6
- saving in fatalities = £1.24 x 50% x 100% = £0.62
- saving in serious injuries = £5.96 x 50% x 2/3 = £1.98
- Total saving = £2.60

[8] The combined effect of the £11 for a traditional bull bar and the loss of the £7.20 pedestrian protection benefit
[9] See assumption 4

**Table 3 Estimated Percentage of pedestrian Directive compliant vehicles in total fleet of vehicles under 2.5 tonnes.**

| Year | Percentage of PPD compliant vehicles registered | | Percentage of FPS fitted to PPD compliant vehicles [10] | | | |
|---|---|---|---|---|---|---|
| | | | Fitted to New vehicles | | Retrofitted to Existing vehicles | |
| | New | All | New fits | Cuml | New fits | Cuml |
| 2006 | 10 | 1 | 4 | 0.4 | -[11] | - |
| 2007 | 30 | 4 | 12 | 1.6 | - | - |
| 2008 | 50 | 9 | 20 | 3.6 | 4 | 0.4 |
| 2009 | 70 | 16 | 28 | 6.4 | 12 | 1.6 |
| 2010 | 90 | 25 | 36 | 10 | 20 | 3.6 |
| 2011 | 95 | 35 | 38 | 14 | 28 | 6.4 |
| 2012 | 100 | 45 | 40 | 18 | 36 | 10 |
| 2013 | 100 | 55 | 40 | 22 | 38 | 14 |
| 2014 | 100 | 65 | 40 | 26 | 40 | 18 |
| 2015 | 100 | 75 | 40 | 30 | 40 | 22 |
| 2016 | 100 | 84 | 40 | 34 | 40 | 26 |
| 2017 | 100 | 93 | 40 | 37 | 40 | 30 |

[10] See assumption 7
[11] See assumption 10

**Cost/benefits for Option 1**

The FPS-equipped vehicle parc in 2017 will consist of OE supplied 'non-rigid' FPS conforming to the ACEA agreement and after-market supplied 'rigid' FPS, both of which may be fitted to either a PPD compliant vehicle of not more than 2.5 tonnes or a non-PPD compliant vehicle. This produces four variants on fitment, with costs as follows:

A) OE FPS conforming to the ACEA agreement fitted to PPD compliant vehicles of not more than 2.5 tonnes, the number of which will be:

= (No. of vehicles fitted with OE FPS) x (% of vehicles <2.5 t GVM) x (% of FPS fitted to PPD compliant vehicles)

= 50,000 x 20% x 37% = **3,700 devices** ---------①

Each FPS will offer an annual casualty **penalty** of £7.20 when fitted to a PPD compliant vehicle (see assumption 3)

Net effect = 3,700 x £7.20/device fitted = **£26,640** (penalty)

B) OE FPS conforming to the ACEA agreement fitted to non-PPD compliant vehicles up to 3.5 tonnes, the number of which will be:

= (No. of vehicles fitted with OE FPS) - ①

= 50,000 - 3,700 = **46,300 devices**

Each FPS will offer similar pedestrian protection to the base vehicle which has a **zero cost** implication (see assumption 3).

Net effect = 46,300 x £0/device fitted = **£0**

C) After-market FPS fitted to PPD compliant vehicles of not more than 2.5 tonnes, the number of which will be:

= (No. of vehicles fitted with AM FPS) x (% of vehicles <2.5 t GVM) x (% of FPS fitted to PPD compliant vehicles)

= 250,000 x 20% x 30% = **15,000 devices** ---------②

Each FPS will offer an annual casualty **penalty** of £18.20 when fitted to a PPD compliant vehicle (see Table 1).

Net effect = 15,000 x £18.20/device fitted = **£273,000** (penalty)

D) After-market FPS fitted to non-PPD compliant vehicles up to 3.5 tonnes, the number of which will be:

The product of (No. of vehicles fitted with AM FPS) - ②

= 250,000 -15,000 = **235,000 devices**

Each of these FPS will offer an annual casualty **penalty** of £11 when fitted to a non-PPD compliant vehicle (see assumption 1).

Net effect = 235,000 x £11/device fitted = **£2,585,000** (penalty)

E) Total annual **penalty** for Option 1
(compared with same fleet without any FPS fitted)

=£26,640 + £0 + £273,000 + £2,585,000

**=£2,884,640/year**

## Cost/benefits for Option 2

In 2017, FPS-equipped vehicle parc will consist primarily of FPS complying with the Directive and will total 300,000 (30,000 per year for 10 years), of which 50,000 will have been supplied as original-equipment (OE) and 250,000 fitted in the after-market fitments (see assumption 8 & 12):

Using the cumulative fitment data from Table 3, it is calculated that

A) The number of compliant FPS fitted to PPD compliant vehicles of not more than 2.5 tonnes will be:

| | A | B | C | |
|---|---|---|---|---|
| | **No. of vehicles fitted with compliant FPS** | **% of those vehicles <2.5 t GVM [12]** | **% of FPS fitted to PPD compliant vehicles** | **A x B x C** |
| **OEM Fit** | 50,000 | 20 | 37 | 3,700 |
| **After-market Fit** | 250,000 | 20 | 30 | 15,000 |
| | | | **TOTAL** | **18,700** |

Each FPS compliant to the Directive will offer similar pedestrian protection to the base vehicle which has a zero cost implication (see assumption 4).

Therefore,

Net effect = 18,700 x £0/device fitted = **£0**

[12] See assumption 9

B) The number of OE or aftermarket FPS fitted to non-PPD compliant vehicles up to 3.5 tonnes will be:

300,000 FPS - (Number of FPS fitted to PPD compliant vehicles <2.5 t)

= 300,000 - 18,700 = **281,300 devices**

Each of these FPS will offer an annual casualty saving of £2.60 compared to the base vehicle (see Table 1).

Net effect = 281,300 x £2.60/device fitted = **£731,380** (saving)

C) Total annual **benefit** for Option 2
(compared with same fleet without FPS fitted)

= (Benefit derived from compliant FPS fitted to PPD compliant vehicles)
+ (Benefit derived from compliant FPS fitted to non-PPD compliant vehicles)

= £0 + £731,380

**= £731,380/year.**

## ANNEX B - Economic Costs

Costs for a typical business

In establishing the likely cost to industry of meeting the Option 2 requirements, companies of various sizes and levels of technology have been considered. It is likely that due to the difficulty (likely impossibility) of meeting the new requirements using traditional tubular metal designs, and the necessary high design and manufacturing investment involved in switching to compliant plastic designs, manufacturers making only metal bars may withdraw from this area of manufacture altogether. However, assuming that there will still be a constant demand for frontal protection systems, this lost market share will be picked up by manufacturers with plastic component design and manufacturing expertise, employing processes such as rotational moulding.

Approval of new FPS meeting the proposed requirements will involve considerable in-house development to ensure the products are capable of passing the required test procedures, and subsequent approval through the UK Vehicle Certification Agency (VCA) or another type approval authority.

It is already evident that many manufacturers have already withdrawn from this market, foreseeing the introduction of legislation in this area. The recent informal consultation suggests that there are now only 6 UK manufacturers of rigid-FPS, with up to 100 jobs linked to their manufacturer, although it has not been possible to determine how many of these jobs would be lost or re-allocated. The vast majority of FPS are understood to be imported from either other European countries or the Far East.

It is anticipated that in the future the market for compliant FPS will be split between, medium volume manufacturers and higher volume manufacturers (who will probably be direct suppliers to vehicle manufacturers). Consultation with manufacturers and trade associations have indicated a range of likely development costs, depending on the volumes and manufacturing technologies used. The two examples illustrated below relate to generic manufacturers in the medium and higher volume sectors of the market. The Directive will require three [13] test procedures for each installation approval. The approximate testing and approval costs are laid out below.

[13] The Directive describes four test procedures. However, only two of these tests: a head test and an upper or lower leg test (depending on the height of the frontal protection system) will be mandatory for any particular installation. The third test is for monitoring purposes only, and not part of the approval.

**Example 1 Medium Volume Manufacturer (approx 1,000 units per year)**

| | First model | Subsequent models |
|---|---|---|
| **Additional tooling cost** | £30,000 | £3,000 |
| **Development costs** | | |
| Impact tests @ £500 per test | £10,000 (20 tests) | £3,000 (6 tests) |
| Development cost @ £40 per hour. (200 hours for first model + 10 hours per test) | £16,000 (400 hours) | £2,400 (60 hours) |
| Materials @ £200 per test | £4,000 | £1,200 |
| **Approval costs** | | |
| Set up costs | £1,000 | £1,000 |
| Child head x 3 | £1,500 | £1,500 |
| Full leg x 3 | £1,500 | £1,500 |
| Approval authority | £1,500 | £1,500 |
| Vehicle manufacturers support | £500 | £500 |
| Materials (inc. vehicle) | £15,000 | £1,200 |
| **Total per model** | **£81,000** | **£16,800** |

Assuming a family of 10 frontal protection system models of a similar design are developed, the estimated development and approval cost for an FPS family would be £81,000 for the first model and £16,800 for the subsequent nine, making an **average of £23,200 per model**.

The figures assume that a base vehicle is required for the approval process, but is repairable between tests. At the discretion of the approval authority, test results from the first vehicle/frontal protection system combination may be used for subsequent vehicle applications if the frontal protection system is of a similar design and the mounting arrangement is such that the initial approval still represents the 'worst case' configuration.

Assuming each of the ten models in a family runs for 5 years at a volume of 100 per year, then the above development/approval costs will be spread over 5000 FPS. Thus the development and approval costs for each individual component £23,200 x10/5000 = **£46.40/FPS**

Assuming an average frontal protection system life of 8 years (bearing in mind the combination of original and after-market fitment) this will give an additional cost of **£5.80/FPS/year**.

**Example 2 Higher Volume Manufacturer (approx 10,000 units per year)**

This example assumes a manufacturer who supplies mainly to a vehicle manufacturer and engineers products to meet original-equipment levels of quality and production conformity. Tooling and development costs will be higher, particularly since test will involve whole vehicles, but the cost will be spread over higher production volumes.

For systems intended to be fitted to non PPD-compliant vehicles, the Directive allows the option for the leg test to be conducted on the vehicle with and without the FPS fitted (back-to-back testing). This is to ensure that the FPS is no more aggressive to the leg than the base vehicle. The alternative is for the manufacturer to test only with the FPS fitted, but to stricter pass criteria. It is likely that manufacturers who anticipate higher volumes for FPS models retrofitted to non-PPD vehicles will take the two-test option

| | **First model** | **Subsequent models** |
|---|---|---|
| **Additional tooling costs.** | £50,000 | £5,000 |
| **Development costs** | | |
| Impact tests @ £500 per test | £15,000 (30 tests)[14] | £3,000 (9 tests) |
| Development cost @ £40 per hour. (300 hours for first model + 10 hours per test) | £24,000 (600 hours) | £3,600 (90 hours) |
| Materials @ £200 per test and including vehicle and replacement parts | £20,000 | £17,000 |
| **Approval costs** | | |
| Set up costs | £1,000 | £1,000 |
| Child head x 3 | £1,500 | £1,500 |
| Full leg x 6 | £3,000 | £3,000 |
| Approval authority | £1,500 | £1,500 |
| Vehicle manufacturers support | £500 | £500 |
| Materials (inc. vehicle) | £15,000 | £15,000 |
| **Total per model** | **£131,500** | **£51,100** |

Assuming a family of 10 frontal protection system models of a similar design are developed, the estimated development and approval cost for a family would be £131,500 for the first model and £51,100 for the subsequent nine, making an **average of £59,140 per model**.

The figures assume that a base vehicle is required for the approval process, but is repairable between tests. At the discretion of the approval authority, test results from the first vehicle/frontal protection system combination may be used for subsequent vehicle applications if the frontal protection system is of a similar design and the mounting arrangement is such that the initial approval still represents the 'worst case' configuration.

[14] Assumes back -to-back leg testing against base vehicle is required.

Assuming each of the ten models in a family runs for 5 years at a volume of 1000 per year, then the above development/approval costs will be spread over 50,000 FPS. Thus the additional development and approval costs for each individual component = £59,140 x10/50000 = **£11.82/FPS**

Assuming an average frontal protection system life of 8 years (bearing in mind the combination of original and after-market fitment) this will give an additional cost of **£1.47/FPS/year**.

Taking an average figure across the range of company sizes, this gives an estimate for the additional cost of a Directive-compliant frontal protection system of **£3.63** per year. Assuming 30,000 systems per year are sold, this gives a total annual cost of **£108,900**

Policy and Administrative Costs

The policy costs to the Department and its associated agencies are primarily up front costs which have already been met under the Department Expenditure Plan, and are likely to represent the most significant costs in this section.

The only administrative costs are for the one-off Type approval fee applicable to each FPS model. This is around £1500/FPS model, and has been included in the calculations above.

Provisions to introduce enforcement requirements by means of an approval-mark check at the annual MOT for FPS fitted to vehicles and/or by Trading Standards officers for FPS offered for sale will be the subject of a separate RIA and may incur additional administrative costs in setting the necessary systems up, and running them.

Implications For Motorists

The increased costs outlined above are assumed to be passed on to the motorist. However, if the increased cost is considerable, the motorist will either decide not to purchase the frontal protection system at all, or decide that a 'compliant' frontal protection system will not perform the function for which it was originally intended. Alternatively, a manufacturer may decide it is not cost-effective to supply FPS to all model variants, thus restricting choice for the consumer.