European Transport Safety Council

# CRASH

ETSC's Newsletter on European Vehicle Crash Protection

CAMPAIGN UPDATE

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## SAFER CAR FRONTS FOR PEDESTRIANS AND CYCLISTS

**ETSC URGES MEPs TO FOLLOW IMPARTIAL ADVICE AND PUT PUBLIC SAFETY FIRST**

- The European Parliament is to present its opinion shortly on the draft agreement on pedestrian protection which the European Commission has negotiated with the car industry. A decision by the Commission is long overdue, largely down to the car industry's successful blocking of progress on this vital safety matter for over a decade.
- ETSC sees the choice for MEPs on pedestrian protection as between the two following options: (a) supporting the weak negotiated agreement currently before them in which the industry has made a last minute offer to manufacture new cars to pass two untested, unscientific pedestrian tests with three times less life-saving potential than already demonstrated on the road today and which fails to provide a high level of protection in the harmonisation process required by the Treaty; or (b) continuing to insist on the European Parliament's previously stated position that there should be a Directive comprising four well-researched tests developed by the EEVC – (the European Enhanced Vehicle-safety Committee which has devised many of the EU's legislative safety tests) which could deliver very large road safety gains.
- ETSC is urging MEPs to reject the draft negotiated agreement because it will save 75% fewer lives than the long promised Directive implementing the four EEVC tests developed for legislation over a 22 year R&D programme financed by the EU and Member States.
- ETSC believes that legislation adopting the four tests (identified by the Commission as one of six cost-effective road safety actions in March 2000) is the most important safety action on the EU agenda and could save up to 2000 lives and prevent 17000 serious injuries annually.
- If the agreement is adopted, the opportunity to save 4 times as many lives will be missed (500 lives saved from agreement compared with 2000 lives saved from Directive adopting EEVC tests)

### WHY REJECT THIS AGREEMENT?

1. It goes against Article 95(3) of the Treaty requiring a high level of protection to be given in vehicle safety harmonisation.
2. The weak agreement will not implement with certainty the scientifically developed cost-effective EEVC tests (with an additional cost at design stage of only 30 euro) which have been used in EU-supported consumer testing (EuroNCAP) since 1996. The only certain tests are non-scientific and will save 75% fewer lives and may lead to new costly leg injuries.
3. It fails to implement even best practice achieved already on the road today. The Honda Civic offers now 3 times the level of protection which the industry offers to implement fully only in 11 years time!
4. If any small initial saving occurs as a result of the agreement then it would be outweighed in a very short time by the large safety gains of a Directive implementing the EEVC tests.
5. Removing this key area of public safety away from the co-decision process and the close public scrutiny which that entails - with no opportunity for Member States or the European Parliament to influence the detail - would be a retrogressive step at a time when the EU has just set a stringent target to cut deaths and has promised citizens to make its policymaking more transparent.
6. This issue has seen many years of missed opportunity to save lives cost-effectively; 22 years of public investment since 1978; 4 draft legislative proposals in the last 10 years (1992 1996, 2000, 2001), promises of a Directive by three EU Commissioners since 1997.

How could there be such a poor result after such enormous cost in lives, time and money?

Instead, ETSC wants to see the introduction now of the draft Council and European Parliament Directive (6065/2000) with a definite commitment to introducing the four EEVC sub-system tests for new types of cars by the year 2008 at the latest, as originally envisaged by the Commission. This would set out clear performance targets to provide focus for industry effort while allowing the European New Car Assessment Programme (EuroNCAP) to encourage earlier take up, as it has done so effectively with EU legislation on front and side impact car occupant protection.

**WHAT'S AT STAKE NATIONALLY AND FOR THE EU?**

If the agreement were to be adopted, the opportunity to save 1500 more lives annually would be missed.

| Comparitive savings from EEVC and voluntary agreement tests | Lives saved annually if EEVC tests adopted | Lives saved annually if voluntary agreement tests adopted | ***Lives not saved annually if voluntary agreement tests adopted instead of EEVC tests*** |
|---|---|---|---|
| AUSTRIA | 57 | 14 | **43** |
| BELGIUM | 50 | 13 | **37** |
| DENMARK | 27 | 7 | **20** |
| FINLAND | 22 | 6 | **16** |
| FRANCE | 291 | 73 | **218** |
| GERMANY | 318 | 80 | **238** |
| GREECE | 121 | 30 | **91** |
| IRELAND | 29 | 7 | **22** |
| ITALY (1998) | 267 | 67 | **200** |
| NETHERLANDS | 40 | 12 | **28** |
| PORTUGAL | 119 | 30 | **89** |
| SPAIN | 274 | 69 | **205** |
| SWEDEN | 28 | 7 | **21** |
| UK | 280 | 70 | **210** |
| EU TOTAL | 1923 | 481 | **1442** |

In this newsletter, ETSC sets out the long background to this important road safety issue:

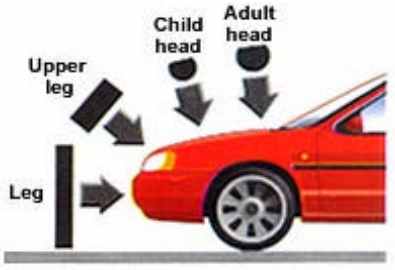
- why we need pedestrian protection
- the development of the EEVC tests, update of casualty reduction, the costs, the necessary changes and feasibility.
- ETSC's assessment of the safety content of the voluntary agreement
- ETSC rebuttals to industry arguments which have blocked progress on this issue for over a decade.
- summary of the EuroNCAP test results
- summary -24 years of history on this issue.

**WHY DO WE NEED SAFER CAR FRONTS?**

- Over 8,400 pedestrians and cyclists die on EU roads annually and over 170,000 are seriously injured. Most are hit by the fronts of cars in urban and residential areas and the majority of these are children and elderly road users. For EU countries pedestrians have a 9 times higher and cyclists 8 times higher death risk than car occupants (CEC 2001). In several Member States there have been annual increases in the numbers of pedestrian and cyclist deaths.
- Many concerted actions are needed to reduce pedestrian and cyclist injuries and these will need to form an important part of the forthcoming 3rd EU Action Programme on Road Safety (2002-2010). As highlighted in the last EU road safety action programme, a priority action, given the EU's responsibilities for vehicle standards, is the harmonisation of vehicle safety design to improve the protection given to pedestrians and cyclists in impacts with fronts of cars (CEC 2000).

**THE FOUR EEVC TESTS PROPOSED FOR LEGISLATION**

Devising four interdependent car crash tests leading to better protection for vulnerable road users has been the focus of a 22 year research and development programme funded by the EU and Member States, involving national transport laboratories, government departments and industry, brought together by the European Enhanced Vehicle -safety Committee (EEVC).




As the diagram shows, the tests comprise:

1. Legform to bumper test to prevent serious knee joint injuries and leg fractures
2. Upper legform to bonnet leading edge test to prevent femur and hip fractures and injuries
3. Child headform to bonnet top test to prevent life-threatening head injuries
4. Adult headform to bonnet top test to prevent life-threatening head injuries

The pedestrian tests, proposed by EEVC originally in 1991 with an updated report to the Commission in 1994 (EEVC 1994) and in 1998 (EEVC 1998), are an integrated package of tests representing impacts to the parts of the body which most frequently sustain severe injuries in car to pedestrian impacts. Sub-system tests were used because they have many advantages over pedestrian dummies for tests intended for legislative use.

They have been used since 1996 by the European New Car Assessment Programme (EuroNCAP) which provides information to consumers on the crash performance of cars and which receives substantial Commission funding. While the European car industry has responded to the car occupant tests in EuroNCAP, which are covered by EU legislation, many new cars tested to date have, in general, performed badly in the pedestrian tests (See Annex for test results).

**HUGE CASUALTY SAVINGS IF TESTS ADOPTED**

ETSC estimates, on the basis of studies carried out under the EU programme and latest casualty data, that up to 2,000 lives and 17,000 serious injuries could be prevented annually if all cars on EU roads today met these tests.

ETSC bases its estimates on different studies carried out during the EU research and development programme on safer car fronts using EU casualty data from the International Road Traffic Accident Database - IRTAD (1999 data), ratios of fatal to serious injury based on several EU countries and estimates of under-reporting of serious pedestrian and pedal cyclist casualties in vehicle crashes.

ETSC has used the estimate for pedestrian savings used by the European Commission (30% saving in deaths and 17% saving in serious injuries) and the Dutch Instsitute for Road Safety Research (SWOV) estimate of pedal cyclist casualty reduction benefit (3.5% of deaths and 8% of serious injuries).

**ESTIMATES OF EU CASUALTY SAVINGS FROM ADOPTION OF EEVC TESTS**

| | Fatal | Serious |
|---|---|---|
| Pedestrians | 1843 | 12664 |
| Cyclists | 80 | 4431 |
| TOTAL | 1923 | 17095 |

NB:Totals include 1998 data (Italy)

**ESTIMATED NATIONAL SAVINGS FROM ADOPTION OF EEVC TESTS**

| | Pedestrian and cyclist deaths | % of EU total | Lives saved |
|---|---|---|---|
| AUSTRIA | 250 | 3% | 57 |
| BELGIUM | 276 | 3% | 50 |
| DENMARK | 141 | 2% | 27 |
| FINLAND | 130 | 2% | 22 |
| FRANCE | 1256 | 15% | 291 |
| GERMANY | 1645 | 19.5% | 318 |
| GREECE | 422 | 5% | 121 |
| IRELAND | 106 | 1% | 29 |
| ITALY (1998) | 1211 | 14% | 267 |
| LUXEMBOURG | 2 | 0.02% | 0 |
| NETHERLANDS | 306 | 4% | 40 |
| PORTUGAL | 434 | 5% | 119 |
| SPAIN | 1026 | 12% | 274 |
| SWEDEN | 131 | 1% | 28 |
| UNITED KINGDOM | 1082 | 13% | 280 |
| EU TOTAL | 8418 | 99.5% | 1923 |

- If all cars on the road today passed the four tests then up to 2000 deaths and 17000 serious injuries could be prevented.
- Over 160 lives lost monthly could be saved and 1400 severe injuries prevented.

**WHAT CHANGES ARE NEEDED FOR CARS TO MEET THE EEVC PERFORMANCE TESTS?**

Pedestrian protection features built into cars can be very effective in preventing serious and fatal injuries in impacts at moderate speeds. Most of the serious injury pedestrian impacts and many fatal crashes occur at impact speeds of up to about 40 km/h in fatal accidents with the fronts of cars. Because of the high forces that pedestrians can withstand, only a relatively small change is required from current car strengths, but larger crush depths between the car skin and underlying immovable parts are needed.

The EEVC tests concentrate on the bumper, the bonnet top and the bonnet leading edge which are the parts of the car which are responsible for most of the severe injuries.

**1. IMPROVEMENTS TO THE BUMPER**

The bumper is normally the first part of the car that makes contact with a pedestrian in a crash. Pedestrians are usually hit in the side when crossing the road often resulting in leg fracture or damage to the knee joint.

Currently most car bumpers are made of plastic but immediately behind the bumper there is often a heavy cross member to provide vehicle and occupant protection. For

pedestrians, the parts behind the bumper need to be moved back or the bumper needs moving forward so that the front face of the bumper will be able to crush about 5 to 7.5cm in an impact with a pedestrian's leg.

**2. CHANGES TO THE BONNET LEADING EDGE**

In pedestrian accidents the bumper contact starts to sweep the pedestrian's legs from under him or her. Next contact is normally between the upper leg and/or the pelvis and the bonnet leading edge. Currently most cars, especially the taller ones are too rigid in this area.

Detailed changes to the sheet metal bodywork of the bonnet edge are required to reduce stiffness and provide sufficient crush depth. This can be done by weakening or moving back the under-bonnet reinforcement, the lock and lock cross-member to allow the outer skin to deform. The actual crush depth and modifications required to make a car safe are very dependent on the vehicle's shape. Streamlined cars will require little if any change to the bonnet edge, larger more upright cars will require up to 15cms of crush depth.

**3. IMPROVEMENTS TO THE BONNET TOP**

The final contact in a pedestrian accident is normally that of the upper body and head striking the bonnet top, the scuttle (area between the rear of the bonnet and the bottom of the windscreen), the windscreen or windscreen frame. The location of the head impact is dependent on pedestrian stature and motion, the position of impact across the width of the car and the size and shape of the vehicle involved. A large area of the bonnet top can potentially be hit in pedestrian accidents.

To make the bonnet area safe for head impacts requires a crush depth of about 5 to 7.5cms and suitable bonnet strength. Large areas of car bonnets are already of about the correct strength and for these areas all that is required is that a crush space is left between the bonnet skin and strong engine or suspension components. Some parts, such as the wing edges and base of windscreen, are strong because they form a strong box where they join. Minor modifications to the joining of the sheet metal are required to help these parts collapse more easily.

**ARE THE CHANGES EXPENSIVE FOR INDUSTRY?**

Different studies use different assumptions e.g. whether new designs of cars or all new cars. Generally, the conclusion as to whether the benefits exceed the costs depends on whether the studies are independent or carried out by the car industry or car industry research organisations. On the basis of the studies carried out ETSC believes that the additional cost at design stage is no more than 30 euro.

The UK Transport Research Laboratory (TRL) has estimated recently that the additional costs to the Honda Civic which meets over 70% of the EEVC tests was £6.50 - under 10 euro!

**CAN IT BE DONE?**

TRL produced an experimental vehicle with pedestrian protection as long ago as 1985 and based on an existing design of car. Contrary to fears expressed by the car industry, TRL demonstrated fifteen years ago that even for existing designs most of the changes required could be met, without inhibiting styling.

**- TRL EXPERIMENTAL SAFETY VEHICLE (1985)**

If the European car industry has not yet shown how it intends to benefit from all the European investment in research and development, Japanese manufacturers have started to do this. EuroNCAP consumer information tests, the Honda Civic on EU roads today meets most of the EEVC tests without using new technology.

**- HONDA CIVIC ON THE ROAD TODAY**

**SUMMARY OF EuroNCAP PEDESTRIAN TESTS**

- These EEVC tests performed in EuroNCAP since 1996 on new cars show that all failed all four tests and most performed poorly.
- The maximum rating is **** (4 stars) which would be needed to pass legislative tests.
- Only three cars (all Japanese manufacturers) received 3 stars but would still not have met 100% of the EEVC requirements overall.
- The tests provide clear objective information that industry as a whole has not yet provided pedestrian protection on a voluntary basis.

*(See Annex 2 for the full EuroNCAP results and www.euroncap.com)*

**THE DRAFT NEGOTIATED AGREEMENT**

As noted previously, this issue has a long history. Implementing the EEVC tests by Directive was foreseen in the last two road safety action programmes and has been long promised by Commissioners. A draft Council and European Parliament Directive went into informal inter-service consultation in November 2000 (6065/2000) and was translated into the eleven official EU languages. A less satisfactory draft was considered very briefly recently.

However, with the imminent introduction of legislation, the European car industry proposed in early 2000 a voluntary agreement which was evaluated subsequently by the Commission's Joint Research Centre (JRC) (who had no previous experience in the pedestrian protection research). The JRC based its recommendation on the car industry proposal. They did not consult the EEVC experts on these matters but concurred with the two tests proposed as the Phase 1 tests in industry's draft negotiated agreement. A hearing organised by the Commission in February 2001 consulted technical experts, organisations and policymakers on the content of the agreement. The safety content of the agreement received severe criticism from safety experts, NGOs and MEPs. Public Hearing: http://www.europa.eu.int/comm/enterprise/automotive/pagesbackground/pedestrianprotection/hearing/index.htm

**SAFETY EXPERTS' ASSESSMENT OF SAFETY CONTENT OF THE NEGOTIATED AGREEMENT**

The content of the draft negotiated agreement is set out in the following Table.

**Phase 1 tests**
First phase tests (ACEA/Joint Research Centre (JRC) 2 tests – legform (bumper only) and combined child and adult area tested with one headform) to be met by:
1st July 2005 by all new types
1st July 2010 by 80% of all new vehicles, 90% by 2011 and 100% by 2012

**Phase 2 tests**
Second phase tests (EEVC) –4 tests – legform, upper leg, child head, adult head to be met by:
2010 by all new types
2012-2014 by all new vehicles
**OR** by 'other measures which are at least equivalent (at least equal protective effects) subject to a feasibility assessment' to be performed before 1st July 2004.

**Further measures**
- Rigid bull bars will not be installed in new vehicles from 2002
- Daytime running lights on all new vehicles from 2002
- Anti-lock braking systems in all new vehicles from 2003

Phase 1 tests

*- Potential injury saving*
The principal pedestrian crash protection measures are set out in Phases 1 and 2 of the agreement. Since Phase 2 does not specify a definite test or set of tests and could consist of other 'equivalent' measures to be reviewed in 2004, it is only possible to assess the safety content of the two Phase 1 tests.

The Transport Research Laboratory has estimated recently that, overall, the Phase 1 tests would contribute around 25% of the fatality reduction effect of the four EEVC tests developed for legislation (Official Report of the House of Commons, UK, 12.11.2001) – that means around 500 lives (25%) annually across the EU compared with 2000 lives (100%) saved from the EEVC tests.

The windscreen test requirement proposed in the draft negotiated agreement is an additional requirement but is unlikely to be very effective because it excludes testing the outer edges, which are the most dangerous parts.

*- Potential side effects*
At the same time, however, independent experts involved in the pedestrian protection research told the Commission Hearing on Pedestrian Protection on 6th February 2001 and a subsequent Parliamentary briefing that, in addition to providing substantially lower

levels of protection than the EEVC tests, the Phase 1 tests were not scientific; the tests would drive car design in the wrong way for effective protection as well as producing serious side-effects (Janssen 2001, Hobbs 2001). Such side-effects have been identified as follows (Lawrence 2001):

- The Phase 1 lower leg bumper test would lead to a situation where many of those saved from lower leg fractures would instead suffer serious knee joint injuries, which are more important because these have a greater risk of permanent disability and consequently are of higher societal cost.
- The Phase 1 head impact test uses a headform which represents an older child than selected by EEVC and does not represent the adult head, would provide inappropriate protection for the adult head and a third of the bonnet area would remain dangerous.
- the introduction of a lower leg test which is not accompanied by a bonnet leading edge test requirement in Phase 1 would be likely to increase femur and pelvic fractures

The German Federal Highway Research Institute (BAST 2001) has suggested there may be a design conflict between meeting Phase 1 and meeting the state of the art EEVC tests. The European New Car Assessment Programme, supported by the Commission, has recently decided not to use the Phase 1 tests for consumer information but to continue to use the EEVC tests. An issue is whether the agreement would allow manufacturers to design to EEVC if they wished. An agreement which prevented manufacturers from doing so would certainly stifle competition to achieve the highest practicable level of protection.

Bull bars

Although bull bars remain a small problem when compared to the damage done by the ordinary fronts of cars, the offer of early action to prohibit the fitment of rigid bull bars to new vehicles is welcome. However, the all important after-market is excluded in this agreement and no information is presented to address the question of how industry will decide which types of bull-bar are safe. A Directive subjecting new types of car to the four EEVC tests would provide the most effective method of removing dangerous bull bars for both original equipment and the after-market. The contribution to pedestrian protection of this offer is hard to distinguish and is likely to be very small.

'Active safety' measures

Two additional measures are proposed in the agreement. The industry has suggested that the introduction of anti-lock braking and daylight running lamps diminishes the need for stringent rulemaking on safer car fronts. While it may be argued that these measures may have merit for other accident types, these should be looked at outside the context of this discussion on pedestrian protection.

*- Anti-lock braking systems*

The impact of anti-lock braking on pedestrian safety has not been scientifically established. Studies show that performance aids which allow drivers to corner more quickly or brake at a later stage, may not necessarily lead to safer driving. Even for car occupants, there are as many studies showing disbenefits as benefits (OECD 1990). Type approval for anti-lock braking is provided for by Directive 98/12/CE and mandatory fitment is required by several Member States in 2004. The contribution to pedestrian protection of this measure is hard to distinguish and may be non-existent.

*- Daytime running lights*

Experts are generally clear about the potential benefits (if not their extent) when it comes to car occupant safety. There is less agreement, however, on potential savings for vulnerable road users such as pedestrians, cyclists and motorcyclists. ETSC believes that the appropriate means of harmonisation on this issue would be through legislation allowing full public discussion of the issues involved. In addition, it is very important that the daytime running lights should conform to a specification, which includes beam pattern and light intensity requirements which are not mentioned in the voluntary agreement proposal.

**ETSC REBUTTALS TO INDUSTRY ARGUMENTS**

Industry has used a series of arguments in its sustained lobby against effective EU action. While industry seems to have conducted most of its lobbying orally rather than putting comments in writing, each argument expressed has been reviewed and rejected by ETSC's experts from across the EU.

***-the voluntary agreement is superior to a Directive since it will offer earlier benefits?***

ETSC believes that a Directive implementing the EEVC tests will save many more lives than could be achieved by the voluntary agreement.

If the voluntary agreement Phase 1 tests saving 500 lives annually were to be implemented in 2005 and a Directive implementing EEVC tests saving up to 2000 lives annually in 2008 (a five year legislative lead time is the industrial norm) it is clear that the small initial saving of the agreement would be outweighed in a very short time by the substantial safety gains of a Directive (See Table on page 1).

The combination of legislative lead times requiring the four EEVC tests for new types (at the latest by 2008 as proposed originally by the Commission) and the EuroNCAP consumer information programme to encourage earlier take-up, would bring larger benefits over time. This would guarantee public safety and encourage market forces without creating the additional injury hazards which are inherent in the voluntary agreement proposal.

Recent EU experience with the front and side impact legislation showed that, within twelve months of good legislative requirements being assured, one car manufacturer after the other presented cars onto the market and EuroNCAP tests demonstrated that they more than met the legislative requirements, despite earlier statements by industry that this was impossible.
The industry proposals for savings from accident avoidance measures are either not proven in the case of benefits to pedestrians, as is the case for anti-lock braking systems, or are small, in the case of daytime running lights.

***-the Phase 1 tests provide 80% of effectiveness of EEVC?***

ACEA have claimed that the first phase of their voluntary agreement offer provides at least 80% of the protection required by the EEVC WG17 test methods.

The industry proposal is considerably less demanding than EEVC Working Group 17. When accident data is examined it becomes clear that the effectiveness will be far less. For example, head injuries are by far the biggest cause of fatalities. Reducing the quality of head protection as proposed by ACEA will have a significant effect on the number of fatal and serious head injuries saved.

As mentioned previously, a recent independent study by the Transport Research Laboratory in the UK reported to the British Parliament in December indicates that the saving would is only 25% of the protection against fatal injury offered by the EEVC tests – that means 75% fewer lives saved.

***- the EEVC bonnet leading edge test would increase child injury risk?***

The results of the VDA (German car industry association) sponsored mathematical simulations of child pedestrians have been used erroneously by the car industry to suggest that softening the front edge of the bonnet would make the bonnet more dangerous for children.

Their pedestrian model did not resemble scientifically a real child and experts of EEVC WG17 reviewed the VDA report and concluded that the VDA models "certainly could not predict absolute injury criteria for children and in relation to that predict absolute injury risk for children."

***- safer car front design will be in conflict with car occupant safety design?***

There are no fundamental conflicts between occupant and pedestrian protection. The Honda Civic scores well in the car uccpnat EuroNCAP ratings as well as the pedestrian test ratings.

***- pedestrians hit the ground after hitting the car, limiting the importance of the car measure?***

Several in-depth accident studies have separated the injuries caused by car and by secondary impacts with the ground. The consensus of these studies is that in most accidents the serious injuries are caused by the car and only minor injuries by the ground. Obviously, in a few unfortunate cases secondary impacts with the road and roadside furniture will cause more serious injuries than the car but this does not reduce the need for improvements in car design.

***- meeting the four EEVC tests is too difficult?***

The Honda Civic meets over 70% of the EEVC requirements now at an additional cost at design stage of 10 euro!

***- meeting EEVC will cost too much?***

Meeting the tests will require some changes in design, but experts believe that the design and manufacturing cost will be small (around 30 euro per car) if the pedestrian requirements are built in at the concept stage. Any small

additional cost will be passed on to the consumer thus they will not be a burden to the manufacturer and will result in savings for society when the reduced road casualty costs are taken into account.

***-the EEVC test methods and tools are not sufficiently biofidelic for Phase 2***

The EEVC tests are sub-system tests rather than tests using dummies. This has long been considered the appropriate starting place, given the difficulties in representing human movements by dummies. It is also the case that industry will use these EEVC test tools for Phase 1!

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**ANNEX ONE**

**HISTORY OF DEVELOPMENTS – 24 YEARS**

**1978** -Large EC and national government funded research programme by research laboratories across Europe (European Enhanced vehicle Safely Committee - EEVC) starts accident research and dummy development for pedestrian protection.

**1979** -UK in depth accident research documents the problem of deaths and injuries resulting from pedestrian/car impacts.

**1985** -UK Department of Transport proposes simple test methods for pedestrian protection.
-TRL demonstrates pedestrian-friendly car (Austin Metro) to ESV Conference.

**1987** -ERGA Safety - A Commission Advisory Group discusses proposal and recommends further work be carried out by the EEVC to develop suitable legislative tests.
-With part funding from the Commission, EEVC sets up Working Group 10 to develop pedestrian crash test procedures.

**1991** **June**: EEVC Working Group 10 completes studies and presents proposals for test methods to ESV Conference.

**1992** **-**Based on the EEVC proposals, the Commission prepares a draft legislative proposal (1) for a Directive (Doc III/4025/92) Brussels.
- Negative benefit to cost study published by ACEA, the European Car Manufacturers Association which ends discussion on the Commission draft.

**1993** -UK Transport Research Laboratory publishes positive EU-wide benefit to cost study on EEVC tests.

**1994** -EEVC Working Group 10 publishes further report validating test methods and developing test tools.
-Dutch Institute for Road Safety Research (SWOV) publishes positive national benefit/cost study on EEVC tests showing savings also for cyclists.
-German Federal Highway Research Institute (BAst) publishes national benefit study of EEVC tests.

**1996** -**January:** Commission presents legislative proposal (2) for discussion by an advisory group. Later that year, it decides a study to assess the existing cost benefit studies is necessary and the draft is not discussed further that year.
-Honda demonstrates pedestrian-friendly car to ESV Conference, Melbourne.

**1997** -**January**: Commission announces intentions to award cost benefit assessment study to UK Motor Industry Research Association (MIRA) (which represent the UK car industry in Governmental discussions on EuroNCAP
-EEVC Working Group 17 invited to review Working Group 10 test methods.
**-February**: EuroNCAP consumer information test programme shows 7 cars performing generally poorly in the 4 EEVC pedestrian test procedures.
**-April:** Road safety communication highlights pedestrian protection in the programme – Parliament's opinion puts a directive on safer car fronts at the top of the road safety agenda.
-**July**: Transport Commissioner, Neil Kinnock states that Commission will publish a legislative proposal in 1998.

**1998** -**January:** Commission published first MIRA report showing that the costs exceeded the benefits. ETSC shows costs are overestimated and benefits underestimated in the report. MIRA report addendum later revised benefits estimates. Unpublished costings are beyond outside scrutiny. Initially the study reported lowest cost-benefit ratio of 5.3:1 later revised to 1.7: 1.

**1999** -**January:** Fifth set of EuroNCAP results published showing cars performing badly in pedestrian tests. Commission supports EuroNCAP.
EU Transport Commissioner announces that the Commission will publish a proposal in 1999.
-**February:** The EEVC report to the Commission having completed minor revisions to earlier tests.
-**June**: The Commission hold a meeting with Member States and ngos to discuss EEVC tests.
**-December:** Commission announce that they will consult Member States again on draft proposal in March 2000. In December and January ETSC and MEPs visit Enterprise Commissioner who promises proposal in the Spring.

**2000** **-January:** Transport Commissioner Mrs de Palacio confirms to Parliament's Transport Committee that the Commission intends to come forward with proposal.

**-February**: EuroNCAP results on small cars indicate continuing poor performance in the pedestrian tests.

**-March:** The new Commission states intention to introduce legislative proposal as one of 6 cost-effective road safety measures in new road safety communication

-**June**: Council of Ministers adopts resolution urging the Commission to bring forward as soon as possible a Directive on safer car fronts to protect the lives of pedestrians and cyclists.

**-August**: Experts say no industry proposal has yet matched equivalence in safety of the 4 EEVC tests. Commission decides to get its Joint Research Centre, not known for its technical expertise in this area, to evaluate on technical grounds an ACEA proposal for a voluntary agreement

**-September**: Vice President de Palacio continues to promote need for type approval legislation, while Commissioner Liikanen says he will present two alternative proposals to the Commission – one voluntary one legislative. A letter from MEPs from all parties demands intervention from President Prodi in favour of a legislative approach.

**-October:** High level group on road safety (representatives of Member States) renew support for legislative proposal. ETSC states that the industry voluntary agreement proposal would lead to 50% less protection and would make some injuries worse than at present. New ETSC estimates of 2000 lives and 18000 severe injuries saved by adoption in legislation of 4 EEVC tests.

**-November:** Informal Commission inter-service consultation of draft Directive proposal (3) COM 6065/2000 which is a two-phase approach with EEVC tests introduced in 2008. EuroNCAP continues to show poor performance of cars tested.

**-December:** European Parliament's Transport Committee renews call for legislation on safer car fronts as top safety priority.

**2001** **-January:** European Parliament's road safety resolution calls for legislative take up of four EEVC tests

**-February:** DG Enterprise and DG TREN organise hearing on pedestrian protection. ACEA and JRC present proposals for voluntary tests. Independent experts and consumer organisations criticise JRC evaluation and JRC/ACEA proposals as unscientific and weak. Criticism by MEPs Mark Watts MEP and Ewa Hedkvist Petersen MEP on content and process of agreement.

**-June**: Honda Civic gains three stars in EuroNCAP tests, passing over 70% of the tests.

**-July**: European Commission issues communication on pedestrian protection and seeks opinion of EU Council and European Parliament and says it will reach decision in December,

**-September**: DG Enterprise's European Motor Vehicle Working Group discusses briefly split level Directive (4) (ENTR/6508/01) (ENTR/6509/01)

**-October:** In responses to Parliamentary Questions, the British Transport Minister tells UK Parliament that:

- new TRL research shows that the voluntary agreement will only save 25% of lives compared with EEVC tests
- the additional cost for Honda of providing pedestrian protection (meeting 70% of EEVC tests) amounted to the equivalent of 10 euro !

**-November**: Council accepts voluntary agreement with certain conditions.

**2002** **-January:** European Parliament begins its discussion on pedestrian protection.

**ANNEX TWO**

**EuroNCAP PEDESTRIAN STAR RATINGS FOR VEHICLE MODELS TESTED TO DATE**

| MAKE | MODEL | RATING Max rating = ★★★★ |
|---|---|---|
| **SUPERMINIS** | | |
| Citroen | Saxo 1.1 SX(2000) | ★★ |
| Daewoo | Matiz SE (1999,2000) | ★★ |
| Daihatsu | Sirion M100LS (2000) | ★★★ |
| Fiat | Punto 55S (1996) | ★ |
| Fiat | Punto S60 1.2 (1999) | ★★ |
| Fiat | Seicento 1.1 (2000) | ★★ |
| Ford | Fiesta 1.25 LX 16 Valve (1996) | ★ |
| Ford | Fiesta 1.25 Zetec (2000) | ★ |
| Ford | Ka 1.3 (2000) | ★ |
| Honda | Logo (1999) | ★★ |
| Hyundai | Atoz GLS (1999) | ★★ |
| Lancia | Ypsilon Elefantino (1999) | ★★ |
| MCC | Smart (1999) | ★★ |
| MCC | Smart (0p S AB) (2000) | ★★ |
| Nissan | Micra 1.0L (1996) | ★★ |
| Nissan | Micra L 1.0 (2000) | ★★ |
| Peugeot | 206 1.3 XR Presence (2000) | ★★ |
| Renault | Clio 1.2 RTE (2000) | ★★ |
| Renault | Clio 1.2 RL (1996) | ★ |
| Rover | 100 (1996) | ★★ |
| Rover | 25 (2000,2001) | ★★ |
| Seat | Ibiza 1.4 Stella (2000) | ★★ |
| Toyota | Yaris 1.0 Terra (2000) | ★★ |
| Vauxhall | Corsa 1.0 12V Club (1999) | ★★ |
| Vauxhall | Corsa 1.2LS (1996) | ★ |
| Volkswagen | Lupo 1.0 (1999) | ★★ |
| Volkswagen | Polo 1.4L (1996) | ★ |
| Volkswagen | Polo 1.4 (2000) | ★★ |
| **LARGE FAMILY CARS** | | |
| Audi | A4 (1997) | ★★ |
| Audi | A4 (2001) | ★ |
| BMW | 3-series (1997) | ★★ |
| BMW | 3-series (2000,2001) | ★ |
| Citröen | C5 (2001) | ★★ |
| Citröen | Xantia (1997) | ★ |
| Ford | Mondeo (1997) | ★★ |
| Ford | Mondeo (2001) | ★★ |
| Honda | Accord 1.8i LS (1999) | ★★ |
| Hyundai | Elantra (2001) | ★★ |
| Mercedes | C-Class (1997) | ★★ |
| Mercedes | C-Class (2001) | ★★ |
| Mitsubishi | Carisma (2001) | ★★ |
| Nissan | Primera (1997) | ★★ |
| Peugeot | 406 (1997) | ★★ |
| Peugeot | 406 (2001) | ★★ |
| Renault | Laguna (1997) | ★★ |
| Renault | Laguna (2001) | ★★ |
| Rover | 600 (1997) | ★★ |
| Rover | 75 (2000,2001) | ★★ |
| Saab | 9-3 (1999) | ★ |
| Saab | 900 (1997) | ★★ |
| Skoda | Octavia (2001) | ★★ |
| Vauxhall | Vectra (1997) | ★★ |
| Vauxhall/Opel | Vectra (2001) | ★★ |
| Volkswagen | Passat (1997) | ★★ |
| Volkswagen | Passat (2001) | ★★ |
| Volvo | S40 (1997) | ★★ |
| Volvo | S60 (2001) | ★★ |
| **SMALL FAMILY CARS** | | |
| Alfa | Romeo 147 (2001) | ★★ |
| Audi | A3 1.6 (1997) | ★★ |
| Citröen | Xsara 1.4i (1998) | ★★ |
| Daewoo | Lanos 1.4SE (1998) | ★★ |
| Fiat | Brava 1.4S (1998) | ★★ |
| Ford | Escort 1.6 LX (1999) | ★★ |
| Ford | Focus (1999) | ★★ |
| Honda | Civic (2001) | ★★★ |
| Honda | Civic 1.4i (1998) | ★★ |
| Hyundai | Accent 1.3 GLS (1998) | ★★ |
| Mitsubishi | Lancer GLX (1997) | ★★ |
| Nissan | Almera 1.4 GX (1999) | ★ |
| Nissan | Almera Hatch (2001) | ★★ |
| Peugeot | 306 1.6 GLX (1997) | ★ |
| Peugeot | 307 (2001) | ★★ |
| Renault | Megane 1.6 RT (1998,1999) | ★ |
| Suzuki | Baleno 1.6 GLX | ★★ |
| Toyota | Corolla 1.3 Sportif | ★★ |
| Vauxhall/Opel | Astra 1.6i Envoy (1999) | ★ |
| Volkswagen | Beetle (1999) | ★★ |
| Volkswagen | Golf (1998) | ★★ |
| **EXECUTIVE CARS** | | |
| Audi | A6 (1998) | ★★ |
| BMW | 5 Series (1998) | ★ |
| Mercedes Benz | E Class (1998) | ★★ |
| Saab | 9-5 (1998) | ★★ |
| Toyota | Camry (1998) | ★★ |
| Vauxhall/Opel | Omega (1998) | ★★ |
| Volvo | S70 (1998) | ★★ |
| Volvo | S80 (2000) | ★★ |
| **MPVs** | | |
| Chrysler | Voyager (1999) | ★ |
| Mitsubishi | Space Wagon (1999) | ★★ |
| Nissan | Serena 1.6 (1999) | ★★ |
| Peugeot | 806 2.0 (1999) | ★ |
| Renault | Espace 2.0 RTE (1998/9) | ★★ |
| Toyota | Picnic 2.0 GS (1999) | ★★ |
| Vauxhall/Opel | Sintra (1999) | ★ |
| Volkswagen | Sharan TDi (1999) | ★★ |
| **MINI MPVs** | | |
| Citroen | Picasso (2001) | ★★ |
| Fiat | Multipla (2001) | ★★ |
| Honda | Stream (2001) | ★★★ |
| Mazda | Premacy (2001) | ★★★ |
| Mitsubishi | Space Star (2001) | ★★ |
| Nissan | Almera Tino (2001) | ★★ |
| Renault | Scenic (2001) | ★★ |
| Vauxhall/Opel | Zafira (2001) | ★★ |

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