# Special edition "Citizen Car"

"The effectiveness of speed limits (…) is fully affirmed by the corresponding changes in the rate of accidents involving physical injury and of standard speeds (…), car manufacturers across the world, swept along by the possibilities of technology, produce ever faster vehicles whose frequently used speeds ("comfortable speeds") diverge ever more each year from the authorised speeds limits, therefore causing *de facto* drivers to exceed the authorised limits on motorways and on ordinary roads (…) it is now time to design vehicles for the public at large which are better adapted to their social use, more energy-saving, and more respectful of the natural and human environment (…)"

This text is sixteen years old[1]. Manufacturers have already been competing in ideas for sixteen years, putting forward an infinite number of suggestions for the road safety campaign, each one more sophisticated than the last, but with one characteristic in common: they all deny the problem of speed and ignore the only appropriate response. Read instead about: "Autonomous Cruise Control (ACC)" to avoid rear collisions which - so they say - could save up to 4,000 lives per year in the European Union if 10% of vehicles were fitted with it… "Lateral Support" (for changing lanes) which could - so they say - save 1,500 lives per year if 0.6% of vehicles were equipped with it by 2010… And 'Awake", a hypo-vigilance system to waken drowsy drivers, which would avoid 30% of fatal accidents on motorways and 9% of all fatal accidents… Not to mention "eCall" (automatic call for help) to reduce the number of victims even further by 5 to 10%... Or even the "City Park", a semi-automatic device for assisted parking… Plus a system for detecting markings on the ground to avoid driving off the road… Plus another Japanese system for directly announcing the fuel consumption according to changes in driving… We must not forget "Night Vision", an infra-red technology which prevents condensation from millions of droplets during foggy conditions by forming a surface of polymers based on nano particles of silicon… And that is not all.

While Messrs Find-it-all fall into engineering, we are in a state of emergency. "The house is burning down and we are blind to it," President Chirac declared at the World Summit on Sustainable Development in Johannesburg, 2 September 2002. This is precisely the point, and without denying the interest of research that gravitates around Information and Communication Technologies in the area of Intelligent Transport, which is still in its early stages, we all have the same feeling of being attacked by door-to-door salesmen and smooth talkers.

The French League Against Road Violence (LCVR) has therefore decided to take matters into its own hands to get what it wants and to tackle the root of the problem. Determined to achieve the favourable and irreversible evolution of industrial production - evolution in the sense of a less aggressive and less polluting car - the League has gathered together a group of experts[2] over the course of more than a year in order to define the values which correspond to our expectations of the Citizen Car: a car which guarantees complete protection of all road users and the environment. Four values were selected: the protection of the occupants of the vehicle; the protection of vulnerable users outside the vehicle (pedestrians and users of two-wheeled vehicles); the protection of the occupants of other vehicles; energy consumption, and $CO_2$ and particle emissions.

We expect this classification to mobilise users by having an influence on their choices when purchasing a new car, and hence to affect the world's entire automobile industry. A community-friendly choice will be promoted by providing information to help modify social representations. Thus, we want our classification to contribute towards renewing the car fleet with fresh demands through a re-orientation of the market, which takes into account what mankind needs to live better.

Be it in the area of telecommunications, banking, domestic appliances, or food, consumers have often opened up the breach for an ethical aspect to be included in the law of the market, in order to make the latter more morally bearable.

Excessive speed plays a part in almost all road accidents: the greater the chance a car has of travelling at high speeds, the greater the driver will be tempted to do so, which increases the risk of getting into an uncontrollable situation. Since the White Paper was issued in 1989, manufacturers have preferred to gear their research towards responding to purchasers' feelings of insecurity rather than attacking the root of the problem which was clearly specified to them from this period.

I therefore dedicate this edition to the thousands of people who have died and the tens of thousands of people injured, who would have been saved if the manufacturers of cars with a performance not appropriate for the law (including engines, of course) had really wanted to protect life rather than their turnover; or if the public authorities had forced them to, as they could have and should have done.

**Chantal Perrichor**
President of the LCVR

[1] Extract from "Livre blanc de la sécurité routière" (White Paper on road safety), tendered to Michel Rocard, Prime Minister, in 1989. The LCVR was part of the group of experts editing this report.

[2] The Voiture Citoyenne (Citizen Car) Group:

Permanent members:
- Claude Got: Honorary professor at René Descartes University, expert member of CNSR (French National Council of Road Safety)
- Jean Lhoste: Honorary research director, French National Institute for Research on Transport and Transport Safety (INRETS)
- Chantal Perrichon: President of the LCVR
- Vincent Spenlehauer: Director of INRETS analysis group on road risk and governance (GARIG)
- Claude Tarrière: accidentologist and biomechanic, legal expert for road accidents
- Michel Ternier: Honorary general highway engineer, former president of the proceedings for evaluating road safety policy (control/sanction), member of CNSR (qualified).

Associated experts:
- Thierry Granger: Professor of economics, Cerpem, Paris Dauphine University
- Pierre-Olivier Adrey: Director of tariffing, MACIF
- Michel Colas: Deputy manager of automobile safety and repair
- Guillaume Rosenwald: President of SRA (Car Safety and Repair).

Consulted experts:
- Dominique Césari: Director of INRETS research
- Jacques Beaumont: Director of INRETS laboratory of transport and environment
- Alain Morcheoine: Director for air, noise and energy efficiency, ADEME (French Agency for Environment and Energy Management)
- Hélène Fontaine: Director of INRETS research, member of CNSR expert committee
- Thierry Renaudin: Director of advanced programs, Arcelor Auto
- Isabelle Cluze: Marketing and environment analyst, Arcelor Auto.

The following also participated:
- Jean-Yves Lamant: National Bureau of LCVR
- Colette Portela: President of AFFIX Group (specialising in risks to company services)
- Véronique Feypell de la Beaumelle: OECD/ECMT
- Corinne Perea: Head of Norauto road safety programme
- Blandine Sardou: Head of Norauto environment programme
- Dominique Husson: Marketing project manager for cars, MAIF
- Sylvie Audelan-Talon: Marketing project manager for prevention, MAIF
- Anders Eugensson: Volvo corporate relations
- Guillaume Brècq: Natural gas vehicles project, head of research, Gaz de France
- Jean Petremont: Natural gas vehicles project, Gaz de France
- Jacky Wirtgen: Head of vehicle classification, MAIF.

Administration and animation of expert group: Cabinet Ithaque.

# ❑ The community-friendly car

## Presentation summary

**A defence of four values:**

- ***the protection of occupants of private cars***
- ***the protection of pedestrians and users of two-wheeled vehicles***
- ***the protection of occupants of other cars***
- ***the protection of the environment***

If we want to maintain the freedom to travel in private cars, we have to adapt to important restrictions. We must use cars whose technology takes into account the necessity of not only ensuring the safety of the passengers but also of reducing the risk for others, the waste of fossil fuels and climate change due to the increase in the greenhouse effect.

Two complementary methods will allow us to reach this objective. They are mutually reinforcing and should not be set against each other:

- increasing the number of consumers aware of the importance of these facts which will alter their demand and will result in the movement towards more "community-friendly" models - this is our objective;
- developing regulations which can facilitate a change in conduct, particularly through tax inducements and deterrents combined with a ban on the most absurd kinds of conduct - this is the role of the government.

The LCVR has set up a working group to define precise criteria of recognised value, enabling cars to be rated and classified in terms of their "community friendliness".

## Selected criteria and calculation of rating for each type of protection

**Protection of road users**

*Protection of car occupants*

We are using tests carried out as part of Euro NCAP (European New Car Assessment Programme). The analysis of the results is expressed by a number between 17 and 36 for recent vehicles tested. Euro NCAP presents these ratings on its website (http://www.euroncap.com), as well as a classification depicted with a number of stars. The results of the protection tests may vary within a small but significant range, mainly according to the different engines with which the basic model is fitted; we are therefore using the star-rating to assess this criterion. This form of classification is not as precise as the rating system but it reduces the risk of error when users apply it to untested versions of the same basic model.

*Protection of vulnerable users (pedestrians and users of two-wheeled vehicles)*

Once again, the Euro NCAP test is used (here, "pedestrian protection") in its most recent version, which has been in force since 1 January 2002. Ratings range from 0 to 22. As with occupant protection, Euro NCAP provides a star-based classification, which is what we use to rate vehicles from 0 to 5. At present, no vehicle is rated above three stars. We assume that this classification is also suitable for two-wheeled vehicle users.

*Protection of occupants of other cars*

Community spirit cannot be based on disregard for others but instead demands an individual attitude to communal life, and so a community-friendly vehicle

must minimise the risk to other car users in the event of an accident. We assess this protection by using the two available parameters that have a major, documented influence on this type of risk:

- *mass*: this defines the variation in the respective speed of two vehicles in a collision, and hence the level of risk of being injured or killed (severity of the collision's consequences);
- *top speed*: this influences the risk of collision by encouraging drivers to exploit the capability of a pointlessly powerful engine. A vehicle with a very high top speed is not adapted to regulations prohibiting speeds in excess of 130 km/h on the fastest roads.

We have compared different methods used to characterise a vehicle's ability to cause damage to third parties. The formula used by many insurance companies, taken from studies by an organisation specialising in risk assessment (SRA, "Car Safety and Repair": www.sra.asso.fr) is particularly interesting because it was established to obtain high concordance between damage caused by one model of a vehicle and the actual expenditure covered by the insurance company for this vehicle. The SRA classification was very similar to that obtained when only considering the vehicle's maximum kinetic energy (1/2 $mv^2$); and it is this simple formula which we used to define the ability to reduce the risk to other motorists (a description of this formula and the maximum kinetic energy are provided in the appendices).

## Protection of the environment

Emissions of carbon dioxide (the main greenhouse gas emitted by private cars) are now a major environmental problem and poorly controlled. Progress has been made on engine efficiency, but instead of focusing on the reduction in consumption by a constant mass, it has only served to offset the increase in vehicle mass and to ensure a higher top speed.

In order to promote vehicles that respect the environment and are economic in terms of fuel consumption, we use vehicle consumption data from UTAC (a French certification organisation). The French Agency for Environment and Energy Management (ADEME) relies on this data to draw up a classification (CarLabelling) which shows $CO_2$ emissions for each model/version of vehicle (http://www.ademe.fr).

The representative character of defined cycles for measuring consumption in urban areas, non-urban areas and on a mixed route is debatable. This is of secondary importance when drawing up classifications; however, the differences observed are not negligible and we have used urban cycle consumption for our rating system. This is because urban gas emissions add local pollutant to the global pollutant effect which is related to an increase in the greenhouse effect. Carbon dioxide emissions in a mixed, theoretical cycle are an international reference which is called to take a leading role in comparisons, as we show in our tables. This has the drawback of not being currently available for all vehicles in the three consumption cycles.

## Conclusions

Societies which identify the adaptations necessary but prove to be incapable of implementing them are in danger. We must reduce human and environmental disturbances caused by avoidable drifts in cars' technical features. It is essential that excessive weight, which is dangerous to others, excessive power, high fuel consumption and pointless speed are penalised.

Users must demand vehicles that protect both themselves and others. Their safety must not be assured at the expense of that of others by using vehicles whose mass is far greater to that of the most reasonable private cars. Reducing differences in aggressiveness between vehicles is a need closely linked to the demands for environmental protection.

To meet these objectives, LCVR is drawing up a vehicle classification based on their community-friendliness. The LCVR is aware that this initiative is one part of a whole which combines vehicle selection, the community-friendly conduct of the driver (especially by respecting speed limits which is an essential factor in environmental safety and protection), and regulatory actions by the government,

which can modify vehicle taxation. ■

# A defence of four values

## Why define and promote the concept of the community-friendly car?

The private car has clearly served us well, and will continue to do so. However, its use is generating significant risks - for us, and for the environment. We know that we must adapt but the scale of the task paralyses us and means that the search for a compromise in our practices - the principles we want to promote and those imposed on us - is deferred. If we want to maintain the freedom to travel easily with our own vehicles, our conduct must change. We must also increase our demands on the technical features of our cars. The objective of the "Citizen Car" initiative is to rate and classify cars currently on the market in terms of the way in which each one responds to the two following major groups of requirements:

- The protection of road users. This cannot be based purely on compliance with regulations imposed by a rigorous control and sanction system. The features of private cars must be optimised to ensure:
  - the protection of their occupants
  - the protection of vulnerable road users outside the vehicle, i.e. pedestrians and two-wheeled vehicle users ;
  - the protection of occupants in other light-weight cars, which requires reduced aggressiveness in heavy and fast models.

- The protection of the environment. Reducing emissions of substances which are dangerous because of a direct effect on air quality or through an increase in the greenhouse effect is a requirement which attempts to compensate for the expected exhaustion of fossil fuels by using vehicles with the smallest consumption possible. It is incompatible with the current development of vehicles whose weight and power constantly increase.

These two technical requirement groups form the basis of the community-friendliness of a car as they take into account the value of relations connecting members of a human community. We must respect others in order to ask them to respect us; we must also extend our solidarity to future generations by not bequeathing them an exhausted and polluted world, overturned by rapid climate changes. The "Citizen Car" initiative aims to provide users with the information required to develop a demand for cars better adapted to their needs and their social choices. Even if a great deal of progress has been made with the safety aspect (active and passive) and with pollution caused by vehicles, we still find ourselves in a situation which shows the urgency of health and safety, and we cannot passively await the development of new institutional standards to include the restrictions to which we must adapt. The optimistic announcement of such an adaptation is a stratagem used to defer the effective action we want to avoid to protect our own interests.

The LCVR has gathered together a group of experts over the course of a year to document the best current references for exploitation in the areas concerned. The group is now in a position to establish a rating system and classification for recent cars.

Certain technical arguments useful for understanding and justifying our choices are presented in an appendix, indicating our references.

## Our choices in detail

The four criteria selected by the working group are documented as follows:

**Protection of road users**

Care for casualties, the disabled, and the aftermath of a premature death is all largely financed by the community, via insurance companies and social security contributions. Avoiding pointless risks which are particularly destructive and expensive is part of the community spirit.

***Protection of car occupants***

The tests carried out as part of Euro NCAP (European New Car Assessment Programme) are now a point of reference for the protection provided for vehicle drivers and passengers (secondary safety). These tests are not fixed but develop over time.

At the moment, two Euro NCAP tests can be used to classify vehicles:

- Frontal impact (impact at 64 km/h against a deformable barrier);
- Side impact (a deformable structure hits the driver's side at 50 km/h);
- Additional points can be obtained using special equipment and the overall result is presented by a numerical value. On its website (http://www.euroncap.com), Euro NCAP presents the ratings obtained and also produces an

analytical indication giving vehicles a star rating from 0 to 5.

The results of the protection tests may vary within a small but significant range, mainly according to the different engines with which the basic model is fitted; we are therefore using the star-rating to assess this criterion. This form of classification is not as precise as the rating system but it reduces the risk of error when applied to untested versions of the same basic model. To give an indication on the significance of the risk of error, we have calculated the difference in weight between the tested version and the rated version; this is a good indicator of the significance of differences between versions of the same model. This indicator is presented as a percentage: 12% signifies that the rated version is 12% heavier than the tested version.

***Protection of vulnerable users (pedestrians and two-wheeled vehicle users)***

Euro NCAP has developed tests using adult and child dummies hit by the front of a vehicle at 40 km/h. Measurements are taken from the legs, thighs and head. The current procedure has been used since 1 January 2002. It affects the majority of commercial vehicles. The overall test results are presented by a numerical value, which is also available on Euro NCAP's website. As with occupant protection, this is classified by Euro NCAP with a star-rating, but no vehicle is rated higher than three stars. We assume that this classification is also valid for two-wheeled vehicle users, based on arguments on biomechanical characteristics. When Euro NCAP carries out impact tests with a standardised dummy head, the results obtained can be interpreted as protection indices for the average human head; but a motorcyclist wears a helmet and may suffer impacts at different angles. These reservations do not challenge the affirmation that the front of a vehicle which is not very aggressive to a pedestrian will be equally so to all road users not protected by bodywork and secondary safety systems (seat belts, airbags).

***Protection of occupants of other cars***

Community spirit cannot be based on disregard for others but instead demands an individual attitude to communal life, and so a community-friendly vehicle must minimise the risk to other car users in the event of an accident. The need to take into account the notion of the relative aggressiveness between vehicles is shown by the following report produced by studies of real accidents: in the event of a collision between a vehicle less than 800 kg and a vehicle over 1,200 kg with one driver injured and one driver killed, the driver killed was 25 times more likely to have been in the lighter vehicle (Martin et al., 2003).

The reasoning bases for this notion of aggressiveness are developed further in the appendix. They take into account compliance with regulations on the maximum authorised speed, and coherence between the masses of different models of private car. We must not use vehicles which are pointlessly fast and which we know travel at excessive speeds more often than others, including in zones restricted to 90 km/h or in built-up areas. Moreover, it is essential to limit a drift towards very heavy vehicles which prove to be dangerously aggressive for occupants of more reasonable vehicles. It would also be possible to act on the compatibility of forms and structures. The heaviest private cars should have a front whose deformation characteristics in the event of frontal impact would reduce the risk of damage for the occupants of light vehicles, whose rigidity would increase at the expense of a minimal increase in mass. Such a development would be major progress and a crash test against a barrier specially designed to simulate the front of a vehicle with optimised compatibility is foreseeable. If Euro NCAP develops such tests, we will incorporate them into our evaluation procedure. With the current state of available data, the criteria we have selected to define aggressiveness are:

- Mass: this defines the variation in the respective speed of two vehicles in a collision, and hence the level of risk of being injured or killed (severity of the collision's consequences);
- Top speed: this influences the risk of collision by encouraging drivers to exploit the full capability of a pointlessly powerful engine in all available configurations. A vehicle with a very high top speed is not adapted to regulations prohibiting speeds in excess of 130 km/h on the fastest roads.

We have compared different approved methods used to characterise a vehicle's ability to cause damage to third parties. The formula used by many insurance companies, taken from studies by an organisation specialising in risk assessment (SRA, "Car Safety and Repair": www.sra.asso.fr) is particularly interesting because it was established to obtain high concordance between damage caused by one model of a vehicle and the actual expenditure covered by the insurance company for this vehicle. The SRA classification was very similar to that obtained when only considering the vehicle's maximum kinetic energy ($1/2\ mv^2$); and it is this simple formula which we used to define the ability to reduce the risk to other motorists (a description of this formula and the maximum kinetic energy are provided in the appendices).

**Protection of the environment**

Emissions of carbon dioxide (the main greenhouse gas) are now a major environmental problem and

poorly controlled. Progress has been made on engine efficiency, but instead of focusing on the reduction in consumption by a constant mass, it has only served to offset the increase in vehicle mass and to ensure a higher top speed.

In order to promote vehicles that respect the environment and are economic in terms of fuel consumption, we use vehicle consumption data from UTAC (a French certification organisation). The French Agency for Environment and Energy Management (ADEME) relies on this data to draw up a classification (CarLabelling) which shows $CO_2$ emissions for each model/version of vehicle (http://www.ademe.fr).

The representative character of defined cycles for measuring consumption in urban areas, non-urban areas and on a mixed route is debatable. This is of secondary importance when drawing up classifications; however, the differences observed are not negligible and we have used urban cycle consumption for our rating system. This is because urban gas emissions add local pollutant to the global pollutant effect which is related to an increase in the greenhouse effect. Carbon dioxide emissions in a mixed, theoretical cycle are an international reference which is called to take a leading role in comparisons, as we show in our tables. This has the drawback of not being currently available for all vehicles in the three consumption cycles.

The group has long debated the comparisons between the drawbacks of petrol and diesel engines respectively. Should diesel engines be penalised for emitting particles particularly harmful to the respiratory tracts and a larger quantity of nitrogen oxides, contributing towards ozone production in the presence of ultra violet rays? On the contrary, should it be taken into account that diesel engines are more efficient overall than petrol engines and therefore produce less carbon dioxide for the same amount of energy produced? This problem has been complicated by the introduction of particle filters and complex systems which trap nitrous oxides or destroy them by catalysis. It is difficult to evaluate the end result because of the scandalous opacity which surrounds this issue. The results of all measures taken are not published, except for the production of carbon dioxide when this could greatly affect users' choices.

In this situation of imprecision and rapid development, we concluded, while recognising the benefit of diesel engines of reducing the greenhouse effect, which is shown just as well by the fuel consumption values as by the measured carbon dioxide emissions, that diesel engines not fitted with a particle filter should be penalised during the period when use of these filters is not obligatory. Particle filters may be optional but we have selected a simple method to rate their absence: the subtraction of one point from the final rating (or four points from the environmental protection rating, marked out of 20) when a diesel vehicle is not fitted with such a filter.

## Why are other *a priori* important factors not considered?

Three reasons justified factors, recognised as important, not being considered.

**There is an obligatory standard which seems relevant and progresses, and manufacturers are bound to comply with it**

Hence this standard is not a criterion of differentiation.

The best example is atmospheric pollution by different groups of gases produced by fuel combustion (carbon monoxide, nitrous oxides, sulphurous oxides, etc.). Improvements in engine and fuel supplies have reduced this type of pollution considerably, but there are still differences in engines used: petrol engines produce more carbon monoxide, and diesel engines produce more particles and nitrous oxides. Old vehicles differ greatly from new models, especially in the emission of particles by diesel engines; the only solution is to define prescriptive standards to be regularly checked with technical tests. We have only used the difference between the presence or absence of particles filters on diesel engines, which has significant consequences on local and regional pollution.

It must be noted that carbon dioxide cannot be classified into the group of substances which are directly harmful, as it is a combustion product which has no irritant or carcinogenic effects on the respiratory tracts. Its major role in the increase of the greenhouse effect justifies it being considered on a particular axis based on fuel consumption. This choice was made to characterise one of the values of the community-friendly car.

The development in obligations promoting the recycling of vehicle parts is also an important decision, which was taken on a European Union-wide level. The standard defined by the EU is a good guarantee which will apply to all vehicles and therefore will not allow for significant differences.

**A risk factor would justify cars being evaluated by a representative criterion of this factor, but we do not have indisputable results from tests carried out on the majority of commercial vehicles**

Vehicles may or may not have structural features promoting their compatibility with other vehicles of different masses. It would be useful to reduce the rigidity of the front of a

heavy vehicle so that it absorbs energy from its deformation during a frontal collision with a light vehicle. By contrast, the latter should be sufficiently rigid to avoid its cabin being deformed. Crash tests should therefore be developed against deformable obstacles specifically designed to evaluate structural compatibility. There is no standard in this area and even if its definition is technically feasible it cannot be included in a standard over the next few years. Clearly, if an organisation such as Euro NCAP were to develop such tests, which we think is necessary, then their results would be incorporated into our definition of the protection of users of other private cars.

The development of systems controlling vehicle stability which ensure that vehicles are prevented from coming off the road by limiting the effects of a sudden manoeuvre is one of the innovations which are hard to evaluate in a short time. In the past, we have seen the effects of advertising on the reduction of accidents through technical advancements which have not been confirmed in the long term. In fact, it is difficult to control all the factors of confusion which are liable to influence statistical results. When a buyer has the choice of optional systems, it is usually the safest drivers who will buy an equipped vehicle. If all versions of a new model are equipped it is impossible to draw a comparison between the two groups, which only differ in the presence of the system. Publications available are in favour of high efficiency in the stability control systems, but they require confirmation, especially by producing explanations on the significant differences in efficiency observed between different studies.

**One feature may have advantages and disadvantages which means an indisputable choice cannot be made**

The energy source used is counted among the features. A vehicle using electric energy, in part or exclusively, does not produce local pollution and therefore has advantages for the population of large urban areas. Besides, electric vehicles are particularly quiet in city conditions and speeds, when the tyre noise is proportionally less significant than the engine noise. This local advantage is not linked to a global advantage taking into account the greenhouse effect if electrical energy is produced by a thermal power plant. The balance of energy from electricity produced by a thermal power plant, including transportation and storage battery capacity, is comparable to that from an internal combustion engine. If we consider that the majority of electrical energy produced in France comes from nuclear energy, the debate moves to the respective advantages of: energy obtained without greenhouse gases being emitted but radioactive waste being produced, some with a very long life; and energy obtained by the combustion of fossil fuels which produce carbon dioxide. We have assessed that we are not in a position to make a reasoned choice between two sources of energy associated with such different, unfavourable consequences.

Vehicles which run on natural gas have very low emissions of pollutant gases, but their production of carbon dioxide is still proportional to the vehicle's consumption.

**One feature may have significant advantages in a particular context which does not affect all citizens, the evaluation of which should still be available**

The best example is child protection. It affects a proportion of users and it is difficult to incorporate this particular protection into a global rating. However, it is very important for the information to be available and Euro NCAP produces a specific rating for any given model of a vehicle which is available on its website. In particular, it assures an important and justified valuation of the ISOFIX system which ensures child seats are well fitted and that there is a firm connection between the seat and the vehicle structure.

***An evaluation according to criteria which approximate those defined for a community-friendly car is desired, but we judge that to be currently impossible***

Two groups of vehicle are foreseeable: commercial vehicles under 3.5 tonnes; and two-wheeled vehicles.

For the first group, the deviation in power and top speed of commercial vehicles is made in parallel with that observed for private cars, but the risk and predictive factors must be modelled to conclude such a project. In particular, the concordance between insurance companies' results and the notion of aggressiveness defined by the maximum kinetic energy must be checked. It does not seem feasible to have tests analogous to those carried out by Euro NCAP for private cars.

We think the issue for two-wheeled vehicles cannot be solved at present. The only notion of a maximum limit of 100 horsepower shows the extent of deviation: the maximum power which is reasonable for a two-wheeled vehicle that can reach 130 km/h is an approximate horsepower of 20. Moreover, as with mopeds whose speeds are restricted when built, derestriction achieves a level which makes a precise evaluation of the risk impossible. As long as we do not have a restriction on speed during construction by structural means, preventing an increase in actual power by simple modifications to electronic programs or changes to certain parts, it will be impossible to exert influence on the fleet of two-wheeled vehicles. Here, the only hope

of reducing the number of deaths of two-wheeled vehicle drivers, and of reducing the risks they will run vis-à-vis other users, is the complete transformation of the control methods and sanctions, especially as regards derestriction - which should entail the vehicle being confiscated in conjunction with a strict regulation on the power. The decision makers cannot hope for results which would be obtained solely by developing the models on offer to be more community-friendly and through pure incentives.

**Which practical method for evaluating a vehicle's community-friendliness?**

Defining the community-friendliness of a vehicle is a new concept. By its very nature it combines four different values, and the originality of the initiative lies in analysing these values. It will involve the presentation of the results obtained according to the different axes and leaving the buyer to "take his pick". Such an attitude has a major drawback: it does not show the best compromise between the different axes used, as it is simply an analytical step. A new concept must not be reduced to the sum of its parts since the "added value" comes from the interaction of the parts. Therefore, a synthesis must be achieved which bears in mind the advantages and disadvantages of different methods which can be used in such a situation.

## Is it technically acceptable to draw up one single classification for all vehicles?

The justifications for possible limitations in the use of different axes must be examined in order to understand the terms of their being extended to the definition of a single classification.

For the protection of vehicle occupants, Euro NCAP indicates that the classification it draws up should be used to compare vehicles in the same group. The justification for Euro NCAP's reservations on a single classification for all groups combined must be understood. It is linked to the lack of standards for structural compatibility between vehicles and the lack of consideration for differences in aggressiveness as we have defined the term. The tests to which the six vehicle groups defined by Euro NCAP are subjected are identical. There are no tests for "superminis" which are different to tests for "MPVs" or sports cars. Hence in a single classification we can compare the results obtained with a single methodology. Euro NCAP's designers know full well that occupant protection would be very different in the event of a collision between vehicles with very different masses, and this is the reason for their reservation. The occupant of a heavy vehicle is more secure than the occupant of a light vehicle. If this notion had to be considered by Euro NCAP without a compatibility test, a weight premium should be awarded! This choice opposes the criteria of the values defining the concept of a community-friendly car and so we have envisaged an axis which penalises weight. It is this option which allows us to take the occupant protection axis into consideration separately from the other factors we envisage that distinguish between vehicles of different masses in the desire to evaluate community-friendliness. We have an axis which enables inter-classification of vehicles, all being equal; and we have another axis which incorporates relations between vehicles, due to their different masses but also to their "different aptitudes" at causing accidents because of their different performances.

For pedestrian protection, there is no biomechanical argument against a single classification. Euro NCAP tests are identical for all models tested and there is no consideration for interactions between vehicles in such a context.

Environmental protection raises an issue that we have not yet considered: that of constraints on specific usage for particular user categories. A large family has no choice: if there are four children to transport, aged between 2 and 18, the family will not be able to use a vehicle with the best rating according to community-friendly criteria. This is obvious; the family has shown its citizenship by having several children, given that we are in a worrying situation where there is no complete renewal of generations. The family will make a community-friendly choice, preferring a large, non-powerful vehicle and the same number of seats to a powerful and pointlessly fast version. The rating and classification we have established concerns almost all of the population requiring transport for 1 to 5 people. We do not forget that families with more than three children currently represent 3.6% of the population. The situation is the complete opposite for vehicles for two people. We have not had to consider this, as no vehicle of this type has been tested by Euro NCAP (the only Smart car that has been tested is the Fourfour).

**Once the necessary and technically justified criterion has been selected, should results obtained be ranked in order according to each of the four values by assigning them a variable coefficient?**

We have decided not to rank the different axes by assigning a specific coefficient to the four ratings. The global rating is the sum of four ratings out of 5.

However, it must be noted that a form of weighting was produced by the fact that the range of the actual rating values obtained according to each of the four axes is not the same. If, in a contest with different tests, examiners

produce ratings using all the possibilities from zero to twenty, their influence on classification during the contest will be more significant than that of another test judged with very restrictive ratings, ranging from five to fifteen, for example. This type of problem is well known to docimology specialists (the science of testing).

So that the results are comprehensible and do not artificially increase the differences in rating according to the four axes, we have used Euro NCAP's classification (the stars) directly for occupant and pedestrian protection as a rating of 0 to 5. We have indicated that the first of these ratings goes only from 2 to 5, and the second from 0 to 4; hence the range is slightly reduced. The rating for environmental protection uses all the possible rating range which gives it a more significant role in making a fine distinction between vehicles in the end classification. Many vehicles have five stars for occupant protection and so will not be distinguished by this criterion, but if one consumes half a litre less per 100 kilometres then this difference will be taken into account. This is also true for the maximum kinetic energy which is based on precise parameters allowing a finer classification between vehicles.

All ratings should vary in the same way so that they can be added and allow for a global estimate on a vehicle's community-friendly value. For protection values produced by Euro NCAP, whose ratings increase from the worst protection to the best, the rating uses the number of stars attributed for occupant and pedestrian protection. By contrast, the potential aggressiveness for other motorists increases with maximum kinetic energy and so the rating variation must be reversed; thus points affected relating to energy levels are subtracted from the maximum rating so that vehicles with the least potential kinetic energy receive the better ratings. The situation is the same for consumption, where the rating should be as low as the consumption or production of carbon dioxide is high.

## Application of the principles to the four value axes used

99 basic models currently on the market have been tested by Euro NCAP since January 2002.

### Protection of occupants

The result of tests on occupant protection for recent vehicles also having benefited from pedestrian protection tests, which entered into force from 1 January 2002, lend themselves to being directly rated from 0 to 5 in accordance with the stars attributed to the vehicle. Currently, ratings vary from 17 to 36 points. The two-star class ranges from 8 to 16 points, and no vehicle tested should have less than three stars; however, one of them has been penalised by the removal of a star because of highly insufficient results for one of the tests. We therefore have one model with two stars; 12 basic models with three; 51 received four; and 36 achieved the maximum number of five stars.

### Protection of pedestrians

The total rating obtained in different tests ranges from 0 to 22. One star is attributed to vehicles with 1 to 9 points; two stars are attributed to vehicles with 10 to 18 points; and three to 19 to 27 points. No vehicle has more than three stars. Thus, as with the preceding criterion, we have a rating with a very limited range and all vehicles are once more in three classes (except for two which had a zero rating for pedestrian protection). 52 vehicles have one star for this type of protection; 37 have two; and only 8 obtain three.

### Protection of other users

We have already indicated that a global balance is well represented by the group in which insurance companies classify a vehicle. This value is produced by a formula validated by knowing the actual expenditure borne by an insurance company for a given vehicle. As this formula is based on concepts such as the ratio between power and weight, the difference between the top speed and 130 km/h, the total mass when loaded and a technical coefficient particular to the vehicle, it is not surprising that it is extremely highly correlated to values calculated much more simply from the mass and top speed of the vehicle. These relations are presented in the appendix with the terms of SRA's calculation mode of the group of insurance companies.

The value of maximum kinetic energy that may be exerted by a vehicle ($1/2\ mv^2$) is so close to the classification of the insurance companies and so directly comprehensible that we have retained this characteristic of a vehicle to indicate the level of risk that other users run. The mass determines the variation in speed imposed on other vehicles, and speed plays a double role: in the risk of causing an accident and also, in the event of an accident occurring, in contributing to the variation in speed of any vehicle hit in accordance with its mass. In other words, it is not the direct causal link between maximum kinetic energy and human injuries caused that is expressed by our ratings, but the statistical link between the mass with a power function of speed on the one hand, and human injuries caused and exploited on the other. This precision is important as it demonstrates well that we are incorporating a risk to primary safety in selecting this formula and that it does not aim just to express a risk relevant to secondary safety.

The issue to be resolved was what limitations to use for ratings. The units for the calculation of maximum kinetic energy are joules, when the units for mass are kilograms, and metres per second for speed. The mass retained is that used in insurance companies' calculations: the unloaded vehicle mass, increased by 200 kilos to take into account the most common conditions under which a vehicle is used. Given the values observed, it is convenient to express the mass in tonnes and to obtain kilojoules. The range of values calculated in our sample vehicles is from 897 to 5,603 kilojoules, but some untested vehicles exceed this. The most powerful engine (450 horsepower) of a Porsche Cayenne has a top speed of 266 km/h for a mass of 2,430 kg (+ 200 kg), i.e. a maximum kinetic energy of 7,179 kilojoules.

Such values go beyond all common sense, and a zero rating for aggressiveness has been attributed to all vehicles whose maximum kinetic energy exceeds 4,000 kilojoules. This is a choice that could be considered arbitrary, assuring a compromise between what is relatively rare - a zero rating - and the reality seen for the majority of vehicles on the road.

At the other end of the maximum energy scale, we could select a minimum reference threshold which would achieve a rating of 20. To simplify, whilst keeping the direct proportion between maximum energy and rating, we obtain the latter by dividing the maximum energy by 200 (because 20 x 200 = 4,000) and subtracting 20 from the value obtained.

A vehicle weighing 1,200 kg (with a load of 200 kg) and able to travel at 144 km/h (40 metres per second) has a maximum kinetic energy of 960 kilojoules; its rating will be equal to 20 - ((950/200) = 15.2). This value is available in the tables documenting the results. The rating out of 20 is then divided by four to obtain a rating out of 5 which then contributes towards the global rating.

**Protection of the environment**

The urban consumption of commercial vehicles included in the database used to model the concept of the community-friendly car varies from 5 litres for 100 kilometres to 20.3 litres. Some commercial vehicles consume a little less than the minimum value observed in this database (remember that it only includes models tested by Euro NCAP) and others much more; the database's known maximum value registering all commercial vehicles is 33 litres. As with maximum kinetic energy, we have fixed a threshold of 13 litres for a hundred kilometres in an urban cycle, beyond which our rating for this criterion is zero. We have defined the useful range for rating as being between 13 and 3 litres for a hundred kilometres for assessing the differences observed on the level of the lowest consumption.

Thus the rating for consumption will be equal to:
20 - ((urban consumption - 3) x 2).

A vehicle consuming 7 l/100 km in urban areas will obtain the rating 20 - ((7 - 3) x 2) = 12. With this choice of rating, the new Renault Clio with a diesel engine, the Ford Fusion, and the Citroën C3 obtain a rating between 15.5 and 16. A diesel engine without a particle filter is penalised by losing a point.

The rating out of 20 is then divided by four to obtain a rating out of 5 which contributes towards a global rating.

**How many decimal places?**

The ratings for the axes of occupant and pedestrian protection are made directly out of 5 by using the number of stars from the Euro NCAP classification. Only whole numbers are used. The other two axes are rated out of 20 and then divided by four to align the different axes of protection; the analysis rating includes the decimal places given in these last two axes.

To summarise, we can say that vehicles which have obtained results which, overall, largely approximate the total of the four protection axes will be differentiated in the general classification by decimal places from the environmental protection rating and the maximum kinetic energy rating. We have maintained one decimal place for the end result with the accepted objective of valuing the relatively insignificant differences in consumption, mass and top speed.

## How is the concept of the community-friendly car used?

**Using the two aspects of the "product": the rating and the classification**

Our attitude has been pragmatic. The issue was not to describe an ideal vehicle and declare that current vehicles were lacking community-friendliness, but to describe the state of matters by rating available vehicles according to the four selected axes of protection. The progressive drift of all models on offer to consumers towards ever greater masses and ever higher top speeds means that even the "lightest" and "slowest" vehicles can seem excessive; however, they will receive a relatively better rating compared to others because we have chosen to rate what exists and not an "ideal" product which does not exist. A value of 10 is of no interest here. By contrast, taking into consideration the versions of different models which exceed 14 or 15 makes sense: these are the vehicles which best represent our concept of the community-friendly car. Observing how many vehicles are represented in the different rating classes is also

useful, and we present graphic illustrations of these distributions in the project's appendices.

**Influencing consumer conduct**

We must not have illusions on the aptitude of manufacturers to spontaneously cause their production to develop in the direction of community-friendliness. The majority have a global strategy and standards are different in Asia, in the USA, or in Europe. In this context, the European Union could play a leading role in terms of safety and the environment.

All products granted approval on a European level which are sold will be commercialised. This does not mean, however, that this submission to the current market shows a capacity for exceptional anticipation and adaptation. The situation may develop very rapidly, and manufacturers do not control all the elements of an anticipated rise in development, which is difficult to quantify because of the price of fuel. Sales of a hybrid vehicle such as the Toyota Prius have significantly increased in the USA as well as in Europe, and this vehicle has been designated "Car of the Year". It will be difficult to make up for Europe's delay in designing such a vehicle, and especially the practical experience in commercialisation and maintenance, and the same is true for spacious vehicles which are lighter than other current models and low in consumption. Thus users must be a factor in development by being aware that they will eventually be the arbitrators of the situation.

Instead of promoting advancements by producing vehicles geared towards foreseeable requirements, manufacturers do little to allow buyers to choose corresponding vehicles. For example, it is currently impossible to have an efficient particle filter on the less powerful diesel engines available on a basic model. In general, the most luxurious models with optional top performance features are only available with the most powerful engines. It is easy to claim that there is no demand when there is no supply either. The purchase terms for a Logan prove the limits of companies' commercial policies. Active promotion with relevant advertising of a real offer for reasonable vehicles is an indispensable step which should involve manufacturers. It is also in their interests in the long term.

The LCVR will research all possible collaborations, including with manufacturers, to promote a movement in purchasing towards more community-friendly vehicles. Our preferred partners will obviously be consumer associations which share our concerns and also experience of defending consumers' interests.

**Influencing the conduct of the government and the EU**

The responsibility of those in power with the duty to act in this area will be considerable over the next few years. It is impossible to continue affirming "*that the house is burning down and we are blind to it*" while continuing to be blind. A planned development led with determination both in France and throughout the European Union will enable manufacturers to adapt.

The first initiative on a national level should be the implementation of a bonus-malus system on purchases, which was considered in the first versions of the 2004 climate plan but abandoned in the definitive version. This measure should be implemented rapidly with an annual, planned progression following its entry into force. The budget may be completely unaffected by the measure, by assuring that the bonus awarded to the most community and environmentally-friendly vehicles is financed by the surcharge on vehicles that fall the shortest of these criteria.

France must act on the level of the European Union to present and defend the project for the limitation on speed during the construction of private cars, as is the case with mopeds, tractors, lorries, and public transport. It is hoped that this measure will assure a differentiation between vehicles in terms of their mass. All vehicles weighing in excess of 2 tonnes should be subjected to the maximum speed limit currently applied to vehicles over 3.5 tonnes.

## Conclusions

Societies which identify compulsory developments and prove to be incapable of implementing them are in danger, as is every organisation which is fixed and inadaptable. We must reduce human and environmental disturbances caused by avoidable deviations in cars' technical features.

It is essential that excessive weight, power, fuel consumption and pointless speed be penalised.

Users must demand vehicles that protect both themselves and others. Their safety must not be assured at the expense of that of others by using vehicles whose mass is far greater to that of the most reasonable private cars. Reducing differences in aggressiveness between vehicles is a necessity closely linked to the demands for environmental protection.

To meet these objectives, the LCVR is drawing up a classification for vehicles based on their community-friendliness. The LCVR is aware that this initiative is one part of a whole which combines vehicle selection, the community-friendly conduct of the driver (especially by respecting speed limits which is an essential factor in environmental safety and protection), and regulatory actions by the government, which can modify vehicle taxation. ■

# ❑ Appendix I: technical appendix

## How were the databases used to model the concept of the community-friendly car set up?

It was necessary to use available data whose validity was largely accepted to define the notion of the community-friendly car during a reasonable time limit. The objective was to produce a new concept by associating different characteristics and not to have our own characterisation of each factor likely to have an influence community-friendliness. The method involved selecting what seemed simple and important to us among the available criteria, and then to proceed to finalising the variables retained so that each could contribute to the end result. We had multiple sources and listing them is appropriate to explain the minimal differences that a single parameter can have. The method consists of:

- results of tests on safety produced by Euro NCAP, an independent organisation set up in 1997, supported by several European governments, the European Commission and consumer associations;
- technical data on each version of a vehicle model declared by the manufacturer to the countries of the European Union as part of the common approval procedure for private cars. In France, UTAC handles this data on behalf of the administration and assigns an identifier to each version, called a CNIT (national identification code for type);
- results on different values of fuel consumption and carbon dioxide emissions presented on ADEME's website, provided by UTAC;
- data used by insurance companies to classify vehicles into a tariffing group. They are notably set up by a specialised structure common to many companies (SRA - Car Safety and Repair);
- characteristics of models and their different versions, published on the websites of car manufacturers and in documents released by specialised press, especially in special summer editions which describe the entire commercial production process.

Euro NCAP data on the protection of vehicle users and of pedestrians are available at *www.euroncap.org*. For our comparative purposes, we have used vehicles which have benefited from the new testing method in use since January 2002 to evaluate pedestrian protection. Furthermore, we have justified the comparison of all vehicles tested and not of vehicles within each of Euro NCAP's 9 classes. This choice was made possible by the similarity of the tests implemented for all classes and our desire to consider the issue of relations between vehicles by drawing up a rating for aggressiveness. A single classification also means that the arbitrary inclusion of a vehicle in one of these classes is avoided. The new Clio which weighs 1,165 kilos is classed with the "superminis", whereas the Logan is in the next class up for "small family cars", weighing 1,040 kilos. Isolating "multi purpose vehicles", i.e. compact vehicles, depends on the functional option and not on structural features radically modifying the safety of the occupants. Weight remains the best indicator for differences between versions of the same model; the data table indicates (in the "diffENCAP" column) the difference between the weight of the analysed model and the weight of the vehicle tested by Euro NCAP as shown on their site. This difference is expressed as a percentage: if it is depicted with a less than sign, the version described has a weight lower than that tested; the weight is higher if the value is positive. The weight of the Seat Ibiza is not given on Euro NCAP's website and we have used a weight of 1,052 kg, the model tested being the Ibiza Stella 1.2.

Data associated with CNIT are now largely available to researchers following a ruling made in 2004 by the Inter-Departmental Delegate for Road Safety (DISR).

The characteristics of versions of a model determining its classification into a tariffing group are available on the SRA website: *www.sra.asso.fr*. The very high number of CNITs issued annually has led SRA to develop an encryption which corresponds to its need to avoid too many pointless duplications for tariffing. Thanks to SRA's assistance, we have been able to create links between their database and that of CNIT for the majority of basic models which interested us, i.e. those tested by Euro NCAP. Connecting the tables allowed for particular assurance that comparisons between the insurance companies' group and CNIT were indeed being carried out between vehicles of the same mass, power and top speed, and using the same type of fuel.

Data on standard consumption and carbon dioxide emissions in particular are given on the *www.ademe.fr*

website. The data is grouped into tables by make and type of fuel used which facilitates consultation. Certain manufacturer sites are very precise in this area; for example, the BMW site presents all carbon dioxide emissions for its models in a PDF document, also indicating the corresponding CNITs.

The availability of these databases and the links set up between them have enabled the method to be tested on 3,703 versions of 100 basic models tested by Euro NCAP with the new procedure for protection of pedestrians. The objective was not to produce a representative database of commercial vehicles but to have a sufficient number of vehicles to test relations between significant variables and to compare models together. In fact, very different numbers of versions are produced and sold from one make to another which will result in an over-representation of certain makes. However, this does not mean that a comparison between versions is any the less significant. This risk would exist if comparisons were drawn between several dozen of them, which is not the case. We have verified this by analysing all versions which have received a CNIT identification without restricting ourselves to those linked to the SRA database. The latter have been used specifically to test the relation between the insurance companies' groups and the other available variables.

Once the statistical relations between the CNIT and SRA databases were established, we reduced the SRA database to only models whose bodywork was tested by Euro NCAP, eliminating estate cars and coupés in the event of a saloon car being tested. We also removed duplications on criteria which are not used in our rating calculations by creating a key for several criteria (the make, the model, whether the engine runs on petrol or diesel, the weight, the top speed, and the power). This procedure meant that a record was only kept of several models which did not differ on these criteria. The number of records was thus reduced to 841. They were used to establish relations between variables, to calculate partial and global ratings, and for modelling before definitive choices were set by the group.

Since this work was carried out, new models have been included to the Euro NCAP database (the new Clio, Fiat Punto, Mazda 5), while certain models are no longer on the market; we have not reproduced all these analyses with the products currently on the market. The initial objective was to test the validity of certain hypotheses by establishing statistical connections between variables and not to permanently update these results. It will be convenient to verify them on an annual basis to show possible modifications to these relations. By contrast, the evaluations of the community-friendliness of a vehicle with the method focused on will be updated as new results are published by Euro NCAP. For example, we have calculated the ratings obtained by the Peugeot 1007, the Citroën C1, the Fiat Punto and the Mazda 5, which are all among the latest models tested.

## How can the reduction in damage caused to other drivers of light vehicles be defined?

Two groups of characteristics must be considered for valuing factors likely to reduce the risk of an accident and the severity of its consequences for all users when it is has not been avoided.

The risk associated with the possibilities for speeds greatly exceeding the maximum authorised limit can easily be characterised by the top speed that the vehicle can reach. The fastest vehicles are most often involved in accidents, regardless of the infrastructure in use and the local speed limits. This fact was determined by insurance companies who incorporate top speed into the calculation formula established by SRA to classify a vehicle being launched on the market. It must be noted that the relative importance of this factor in the actual offer is reduced, since the top speed of the slowest vehicles has constantly increased over recent years. Almost all commercial vehicles exceed 150 km/h. Removing the rungs at the bottom of the ladder does not mean that the risk is reduced when jumping from the highest rung! Luckily, we have all the data from insurance companies regularly published over a long period in a biannual analysis report which isolated the notion of physical injuries to third parties. These are the best arguments for affirming that the frequency rate of accidents with physical injuries to third parties and the level of accident severity (characterised by the average cost) increase with the value of the vehicle's classification group; the group itself being directly dependent on the top speed and the power of the vehicles.

Currently, we are unable to separate the desire of the driver who buys a very fast car to travel at speed and the incitement to speed produced by a vehicle's capacity to travel very fast; but there are two reasons why these "attributable fractions" are not necessary, which justify the financial penalisation and, ultimately, the prohibition of vehicles which are pointlessly fast:

- the number of accidents caused by a very high speed is far from negligible and they do not only occur on motorways limited to 130 km/h. Bypass motorways and express roads, such as national and secondary roads, are also affected. Most of these accidents at very high speeds would not have happened if the driver had not been able to reach the speed he was at when faced with the risk of an accident. The accident which cost the lives of the

firemen in Lauriol is indicative of this;

- the relation between the characteristics of a tool and its use is proved in numerous circumstances. A part of the progress observed in reducing risk at work was obtained by prohibiting features which are potentially dangerous from being maintained in a machine or product when they are not useful for their intended purpose and it is technically possible to remove them.

The constraints that the occupants of two vehicles are subjected to when involved in a frontal collision caused by a given impact speed for each of them depend on several groups of factors:

- the respective masses of the two vehicles which will determine their variations in speed during structural deformation;
- individual protection systems (safety seat belts, inflatable airbags);
- the structural design of vehicles which will determine the nature and significance of any deformations.

We are not considering the influence of individual secondary safety systems here, which heighten the protection of vehicle occupants included in the results of the tests carried out by Euro NCAP. We are limited to evaluating the contribution to the risk "for others" by the respective mass of the two vehicles on the one hand, and by their structural design on the other.

The variation in speed of the two vehicles during a frontal collision depends on their respective masses. $\Delta v$ = relative speed x (M1 / (M1 + M2))

For example, if two vehicles with the same mass of 1,000 kg have a speed on impact of 10 m/s, their relative speed is 20 m/s and the relation between the mass of one and the total of their masses is 0.5. The variation in speed will be the same for both vehicles; equal to half the relative speed, or 10 m/s (the two vehicles stop on the spot in the event of a direct frontal collision and the cancellation of their speed is certainly a variation in speed of 10 m/s). It must be noted that in this situation of a frontal collision, only the relative speed counts: if one of the two vehicles was stationary and the other had a speed of 20 m/s, then the variation in speed would be identical for both vehicles. One would be projected backwards at a speed of 10 m/s and the other would be slowed down by 10 m/s.

Documentation on the connection between the risk of injury or death and the variation in speed in the event of a collision has been assured for many years in France and in other industrialised countries having developed accidentological studies. The relation between the respective masses of the vehicles colliding head on and the occupants' risk of being killed is also a fact recognised by the whole scientific community.

The only issue under discussion is the practical interest in introducing an additional characteristic, namely structural compatibility between vehicles involved in a collision. It is possible to imagine vehicles which will have different deceleration laws in a collision, their structures having been designed to reduce the aggressiveness of a heavy vehicle in a frontal collision with a light vehicle. These differences call to mind the notion of a vehicle's mechanical "rigidity". Without going into the details of this characteristic, it can be summarised by indicating that a vehicle with a given mass may have a more deformable front than another vehicle of the same mass. This characteristic is not only applicable to the law of deceleration affecting the opposing vehicle, it will also act on the deceleration to which the occupant strapped in is subjected and possibly retained by the airbags. A deformable front represents the additional stopping distance and therefore the additional time for undergoing the variation in speed, which will allow the maximum deceleration and the average deceleration to be reduced. Manufacturers try to optimise the constraints experienced by the occupants by connecting the deformation possibilities that will reduce the "brutality" of the impact to the rigidity of the cabin that will allow avoidance of "intrusions" detrimental to safety. They can also take into account the mass of the vehicles and optimise the respective characteristics of vehicles with different masses in order to avoid deceleration peaks which are highly brutal to occupants of the lightest vehicles.

Differences of opinion have emerged between participants in the working group, not regarding the reality of these issues of structural compatibility, but regarding the progress that can be made in the future with a better consideration of the demand for compatibility and the time frames that will be necessary. Certain "progressives" saw it as an important source of reducing risks for occupants of relatively light vehicles; others, more sceptical, estimated that restrictions would remain if weight continued to increase, with the laws of physics being unchangeable and variation in speed only being able to depend directly on the ratio between the masses. In the current situation, with neither a standard nor an obligation to obtain optimisation of structural compatibility, it is imperative to develop the weight of the most wide-spread vehicles (4/5-seater saloons) within stricter limits than those observed at present, i.e. to penalise all very heavy vehicles and not just the 4x4s.

To avoid all confusion between the actual effect of top speeds and the respective masses of vehicles in causing injury to other drivers and the effects associated with the structure of the vehicles (form and mechanical characteristic of deforming in the event of a collision), the group systematically uses the term of aggressiveness to designate the first group of facts, and compatibility for the second.

If manufacturers mutually agree, or if the European Union is capable of imposing new standards on them for structural compatibility between vehicles, it will be simple to consider these new measures in evaluating vehicles' community-friendliness; but the following must be borne in mind:

- if these standards are optimised and applied to all vehicles, they will not be a factor in differentiating their community-friendliness;
- it is possible that these new regulatory measures will only be effective in about ten years, and they may also never see the light of day.

While awaiting these developments, the useable factor for classifying the protection of users of other vehicles cannot be evaluated just by a variable dependent on its travelling speed and its mass.

## Connections between the different values that can be used to define the community-friendly car

This is a database of 841 versions of 100 vehicles tested by Euro NCAP with the test on pedestrian protection which was used for comparative purposes. It is important to consider the relations which combine the "mechanical" variables and their relations to vehicle consumption on the one hand, and the validated risk estimates on the other, such as classification by insurance companies.

**Connections between variables which determine vehicles' top speed**

The top speed is determined by the maximum power of the engine, the weight of the vehicle, its front surface, its coefficient of penetration in the air, and its transmission characteristics which should be optimised to make full use of the maximum power supplied at a certain speed. We do not have all the variables for the vehicles studied but it can simply be stated that power is the dominant element.

Regression analysis - linear model : $Y = a + b^*X$

Variable to be explained: VMAX
Explanatory variable: DIN H.P.

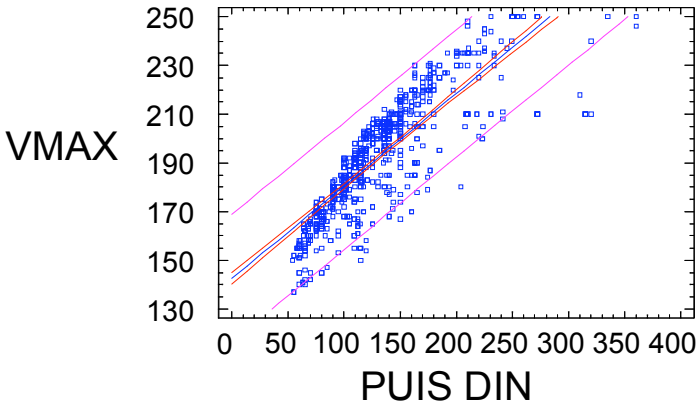
| Parameter | Estimation | Error type | T | Proba. |
|---|---|---|---|---|
| Ordinate | 142.541 | 1.24808 | 114.208 | 0.0000 |
| Gradient | 0.379527 | 0.00882672 | 42.9975 | 0.0000 |

Variance analysis

| Source | Sum of error squares | df | Mean square | F | Proba. |
|---|---|---|---|---|---|
| Model | 327,530.0 | 1 | 327,530.0 | 1,848.78 | 0.0000 |
| Residual | 148,637.0 | 839 | 177.16 | | |
| Total (corr.) | | 476,168.0 | 840 | | |

Correlation coefficient = 0.829365
R-square = 68.7847%
R-square (adjusted for df) = 68.7475%
Estimate of standard residual deviation = 13.3102
Mean absolute error = 10.3558
Durbin Watson test = 0.556123 (P = 0.0000)
Residual autocorrelation of order 1 = 0.720868

**Relation between power and top speed**




Due to the non-linear growth in the power required to increase speed, it is possible to further improve the correlation between the two variables by using a function based on the power affected by an exponent less than 1. It increases the correlation coefficient from 0.83 to 0.87.

***Simple regression - VMAX as a function of DIN H.P.***

| Regression analysis - multiplicative model: Y = a*X^b | | | | |
|---|---|---|---|---|
| Variable to be explained: VMAX | | | | |
| Explanatory variable: DIN H.P. | | | | |
| Parameter | Estimation | Error type | T | Proba. |
| Ordinate | 3.84354 | 0.0271326 | 141.658 | 0.0000 |
| Gradient | 0.292901 | 0.00562522 | 52.0693 | 0.0000 |
| NOTE: Ordinate at origin = ln(a) | | | | |
| Variance analysis | | | | |

| Source | Sum of error squares | df | Mean square | F | Proba. |
|---|---|---|---|---|---|
| Model | 9.84436 | 1 | 9.84436 | 2,711.21 | 0.0000 |
| Residual | 3.0464 | 839 | 0.00363098 | | |
| Total (corr.) | 12.8908 | 840 | | | |

Correlation coefficient = 0.873886
R-square = 76.3676%
R-square (adjusted for df) = 76.3394%
Estimate of standard residual deviation = 0.0602576
Mean absolute error = 0.0456145
Durbin Watson test = 0.471227 (P = 0.0000)
Residual autocorrelation of order 1 = 0.762738

The equation for the adjusted model is:

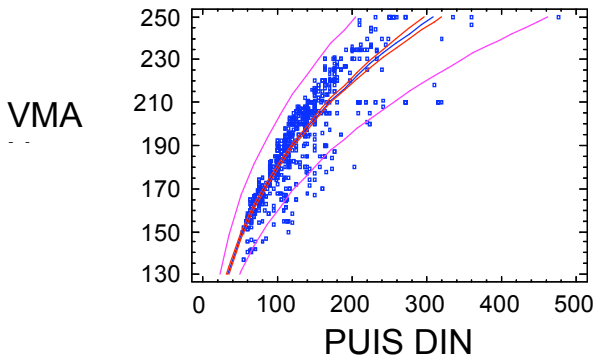
VMAX = 46.6905*DIN H.P.^0.292901

or

ln(VMAX) = 3.84354 + 0.292901*ln(DIN H.P.)

Since the probability value in the ANOVA table is less than 0.01, there is a significant statistical adjustment between VMAX and DIN H.P. on a 99% confidence level. The R-square statistic indicates that the adjusted model explains 76.3676% of the variability in VMAX after a logarithmic transformation to make the model linear.

**Correlation with a multiplicative model**




## Connections between consumption, maximum power, type of fuel, weight and top speed

These relations are particularly interesting since they show the absurdity of producing pointlessly powerful and heavy cars even under normal usage conditions which will not allow them to make full use of their capabilities. We know that the standard urban cycle used for measuring consumption is far from representing the results of sporty driving. By contrast, it is a cycle corresponding to very "calm" vehicle usage. Despite these standard characteristics, urban consumption is directly determined by the vehicle's maximum power, the type of fuel used and its weight.

We have shown the force of the relation between a vehicle's top speed and its maximum power (correlation coefficient of 0.87). It is also important to show the relations between several variables, the combination of which determines consumption. Explaining consumption in an urban cycle by the maximum power, the top speed, the total weight allowed when loaded, and the type of fuel used can be done by calculating a multiple regression with these variables. This simple method shows that 89% of the variance in consumption can be explained by these four variables.

## Connections between the insurance companies' groups (SRA) and variables characteristic of the vehicle

When a new vehicle is launched on the market, SRA calculates its classification group to establish the cost to be paid for insurance (premium). The mathematical formula used was established from data on a large number of accidents, and produces a value correlated to insurance companies' average expenditure for a given model.

There are two major steps to this formula: the first is determined by the simple characteristics of weight, power, and top speed; the second is a rating of the technical design, varying with the systems for protection and repair costs. The initial constant equal to 20 is merely to increase the group's end result so that all models have the same value, which avoids confusion with the old method of setting the group which resulted in values ranging from 4 to 20.

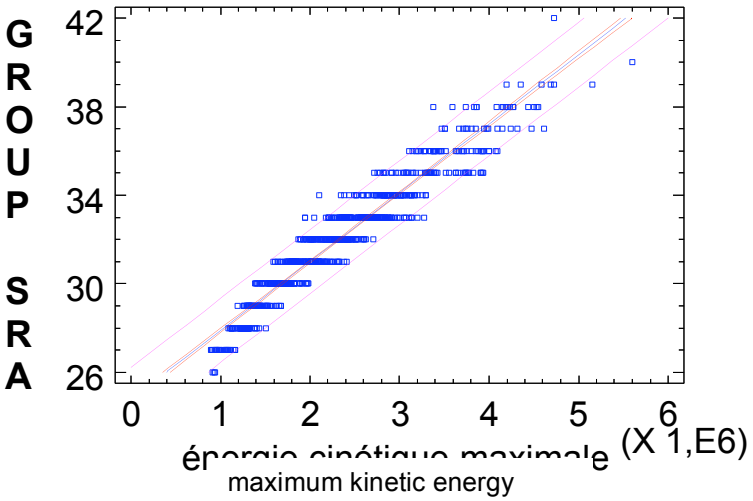
The group is equal to:

- 20+
- (27.88 x (DIN horsepower/unloaded mass in kilograms + 200)) +
- (1/13 x (top speed in km/h - 130)) +
- (0.00283 x GVWR)
- the value obtained by this first step of the formula is then multiplied by (1 + design rating)

It is necessary to determine the importance of the weighting by the design rating of the vehicle. It is easy to establish by calculating the group of our 841 versions with the first step in the formula and comparing it to the value obtained by SRA with the whole formula. The correlation coefficient is very high indicating a very low intervention of the second step of the formula, at the very least for current vehicles which are those tested by Euro NCAP and which we have used in this present analysis. The coefficient may be far less lenient for "atypical" vehicles.

It is useful to analyse relations between the group of insurance companies and the variables set up from simple physical data able to translate the notion of vehicles' "aggressiveness" vis-à-vis occupants of other private cars. It must be noted that taking into account speed in the insurance companies' formula is interesting due to its reference to 130 km/h,

**Correlation between SRA groups and maximum kinetic energy**




which is the maximum speed authorised on motorways in France. It is the "excess speed" in relation to 130 which will increase the group's final value and not the consideration of the top speed in km/h. This procedure particularly penalises vehicles whose top speed is very high, just as the increase in the top speed squared can do in the calculation of maximum kinetic energy. Thus it is not surprising that the insurance companies' group is highly correlated to 1/2 $mv^2$.
A simple regression between the insurance companies' group and the maximum kinetic energy produces a correlation coefficient of 0.96. Therefore there is only a minimal difference between the two variables, which is not surprising.

We knew long ago that damage caused by a vehicle depends on its top speed and mass. The relation is statistical by its very nature and is very strong. This does not mean that a driver respecting regulations and others cannot drive a pointlessly heavy and fast vehicle without excessive risk, but that all drivers in such vehicles will be faced with a greater number of situations where their excessive speed in that context will cause an accident, with the excessive weight of their vehicle causing significant damage to other users.

It was also interesting to compare the notion of "amount of movement" for insurance companies' classification. This amount is equal to mv and means that mass is relatively more important than top speed, unlike maximum kinetic energy. The correlation coefficient is slightly decreased to 0.90, whereas for maximum kinetic energy it was at 0.96. This concords with the importance in the SRA formula of subtracting 130 from the vehicle's top speed before multiplying this difference by the coefficient 1/13. If the vehicle can reach 170 km/h the difference is 40; if it can reach 210 the difference is 80. This means that the influence of the speed variable for an increase of 40% in speed from 170 to 210 km/h is twofold.

Groupe SRA

this vehicle in a tariffing group by the insurance companies are very similar procedures. We would have classed and rated the vehicles with barely different results by using either method. The ease of using the formula for calculating the maximum kinetic energy and its educational role in

showing us the importance of speed and weight in causing damage have made us keep this variable as a good indicator of the aggressiveness of private cars.

## How was the database on private cars set up, enabling a classification to be established and opportunities for comparison to be made available when new vehicles are launched onto the market?

The number of basic models tested by Euro NCAP since 1 January 2002 and still on the market as of the end of 2005 is 98. The list is available in the table entitled "EuroNCAP0905", to indicate its publication in September 2005.

It consists of 98 lines with 9 variables in columns (with no special characters used to allow for inclusion in database software that does not support them):

- *num*: order number from 1 to 102 (the numbers of the models which are no longer on the market have been deleted). This is a unique key for the table, enabling a link to the second table;
- *classEncap*: number from 1 to 9 corresponding to Euro NCAP's different classes, in the order of the organisation's website (superminis, small family cars, large family cars, executive cars, roadsters, large off-roaders, small off-roaders, small MPVs and MPVs);
- *make*: the make;
- *modelEncap*: the model of the version tested;
- *year*: year of the test (must be 2000 or later to be included);
- *weight*: weight as defined in the Euro NCAP protocol, i.e. an unloaded weight. 88 kg for an adult dummy, 26 kg for two child dummies, and 36 kg for luggage are added afterwards;
- *frontal, lateral, total*: ratings on the three types of protection for the occupants (total may be higher than the sum of the first two ratings if particular devices regarding safety belts are present);
- *staroccupant*: stars for occupant protection;
- *pedestrian*: rating for pedestrian protection;
- *starpedestrian*: stars for pedestrian protection.

The association of this first database with sources enabling identification of different versions on the market has allowed us to draw up a second table of data using several different sources, notably ADEME's website, that of the insurance companies (SRA), specialist reviews and manufacturer websites. This table is entitled "Thisis0905".

The denomination of the variables is usually clear, but the meaning of some of them must be clarified:

- *make*;
- *model and version*;
- *fuel*;
- *filter* : indicates the presence or absence of a particle filter on diesel engines. The information is not always available from our sources and if a model bought has a particle filter but does not appear in our database, one point must be deducted from the rating obtained to take this into account. The situation is constantly developing for this criterion; many vehicles have just been fitted with particle filters or will be in the coming months;
- *globalrate*: rating obtained from the sum of the ratings for each of the four axes, and therefore out of twenty;
- *classification of all different versions*;
- *aggressionrate*: rating out of five obtained from the maximum kinetic energy;
- *prooccupant*: stars obtained for occupant protection (value out of 5);
- *consumrate*: rating out of five obtained from consumption in an urban cycle;
- *numencap*: corresponds to the model number in the Euro NCAP table;
- *gearbox*: manual, automatic or semi-automatic;
- *unloaded weight*: concerns the version rated;
- *weight Encap*: weight of the model and the version tested by Euro NCAP;
- *diffweight*: difference in weight (lighter or heavier) in relation to the model tested by Euro NCAP (in %);
- *consumurb*: consumption in an urban cycle;
- *consumexurb*: consumption on the road;
- *consummix*: consumption in a mixed cycle;
- *carbondioxide*: amount of carbon dioxide produced per kilometre on a mixed route;
- *vmax*: top speed;
- *kemax*: maximum kinetic energy in kilojoules.

We have used bodywork models which are tested by Euro NCAP when the information could be obtained, which is not always easy from photographs on the Euro NCAP website, especially for the number of doors (3 and 5 doors). Coupés and estate cars have not been used, except for when a specific test is available (Mégane CC and 307 CC). Of course it is possible to use the table to classify a non-tested estate car whose weight, top speed and urban consumption is known; but the results may be imprecise and we have preferred to avoid this extension to Euro NCAP tests. The number of versions used for the 98 models is 772.

## Analysis of the ratings obtained for the four axis values

It is useful to begin with an observation on the distribution of these ratings to understand the possible reasons for their asymmetry and the significance of the zero values when a threshold effect has been created by calculating the consumption and aggressiveness ratings.

### Protection of occupants and pedestrians

The number of basic models tested by Euro NCAP since 1 January 2002 and still on the market as of the end of 2005 is 98. The list is available in the table entitled 'EuroNCAP0905", to indicate its publication in September 2005. The number of result classes is limited to four, since no vehicle is classified below 2. It is useful to compare the distribution of these 98 vehicle models between the result classes and the distribution of the database formed from different versions which will be rated on the other two axes to define their community-friendliness. This comparison allows for a verification of the lack of significant discordance between the distribution of vehicles in these classes. The "best vehicles" which obtained five stars on the occupant protection criterion have, on average, nine versions; the group with four stars a few less. The average number of versions falls below 5 for vehicles with 3 stars.

**Table 1 - Protection of occupants**

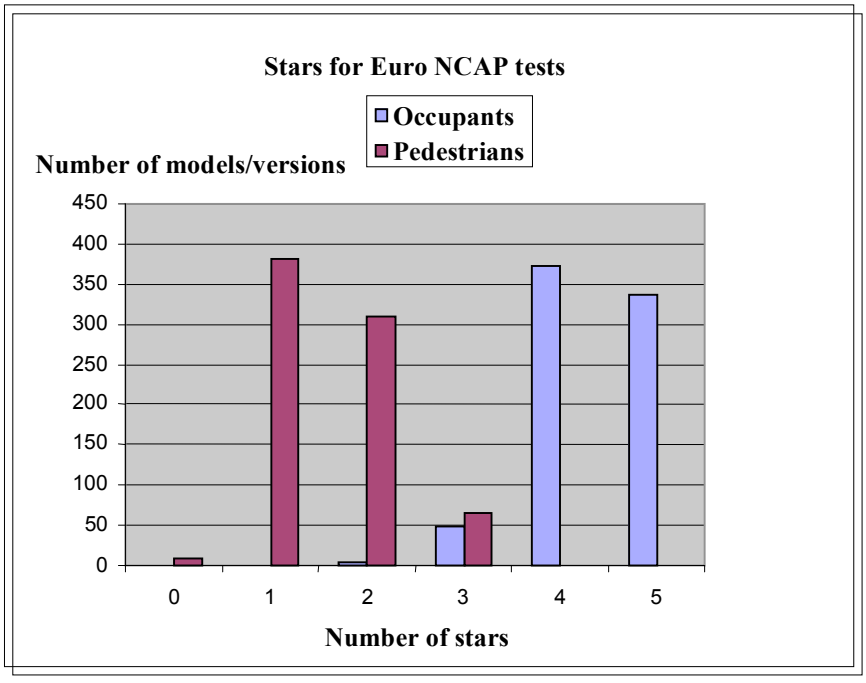
| | Euro NCAP (models) | THISIS database (models/versions) |
|---|---|---|
| 2 stars | 1 | 4 |
| 3 stars | 10 | 47 |
| 4 stars | 50 | 379 |
| 5 stars | 37 | 342 |
| Total | 98 | 772 |

With the same objective, table 2 presents the distribution of the number of versions in the Euro NCAP database (98 models) and in the "Citizen Car" database (772 models/versions) in terms of the rating for pedestrian protection. The average number of versions per model does not differ greatly from one class to another (7 to 10 versions per model, except for the class with 2 models rated zero).

**Table 2 - Protection of pedestrians**

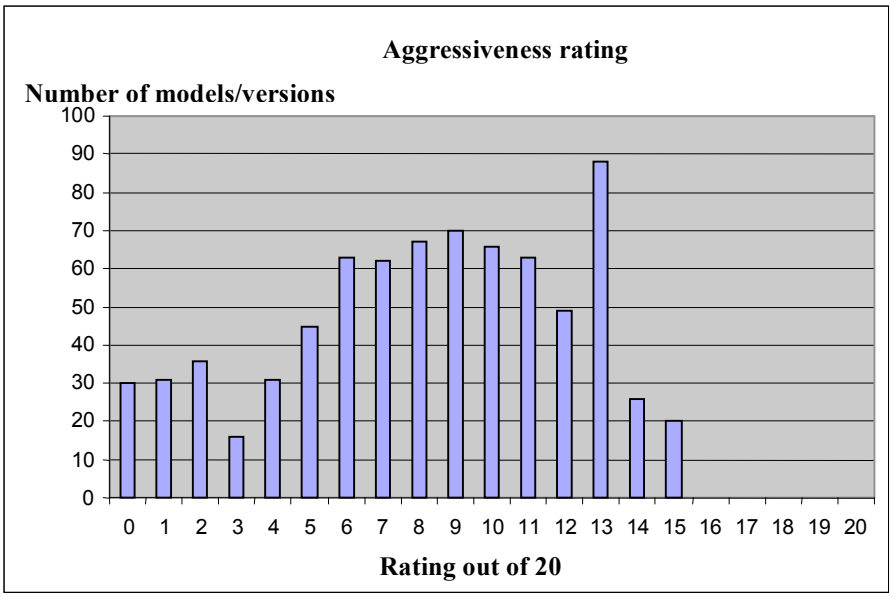
| | Euro NCAP (models) | THISIS database (models/versions) |
|---|---|---|
| 0 | 2 | 8 |
| 1 star | 50 | 381 |
| 2 stars | 37 | 319 |
| 3 stars | 9 | 64 |
| Total | 98 | 772 |

A graph linking both rating totals for protection from Euro NCAP tests shows the drift in distribution of the occupant protection ratings towards higher values and, by contrast, that of the pedestrian protection ratings towards lower values.



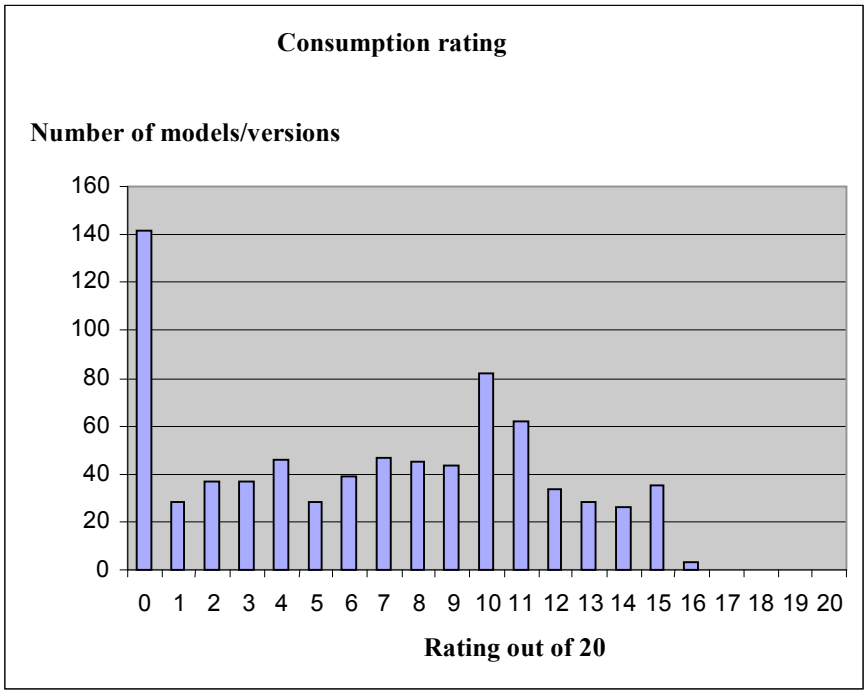
## Protection of occupants of other vehicles

It is the rating out of 20 which is used in the graph representing the distribution of models and versions for this criterion. If the importance of the reduction in aggressiveness had been taken into account and encouraged by the public authorities, especially by using a dissuasive regulation, we would have a significant number of versions rated 16 or 17, i.e. incapable of developing a kinetic energy exceeding 600 kilojoules. Vehicles with ratings from 0 to 12 and even 13 show the inability of industrial societies to master certain technical deviations.




## Protection of the environment

The importance of offering vehicles with very high urban consumption, over 13 litres per hundred kilometres, must be noted. The rating on this protection axis is therefore zero.



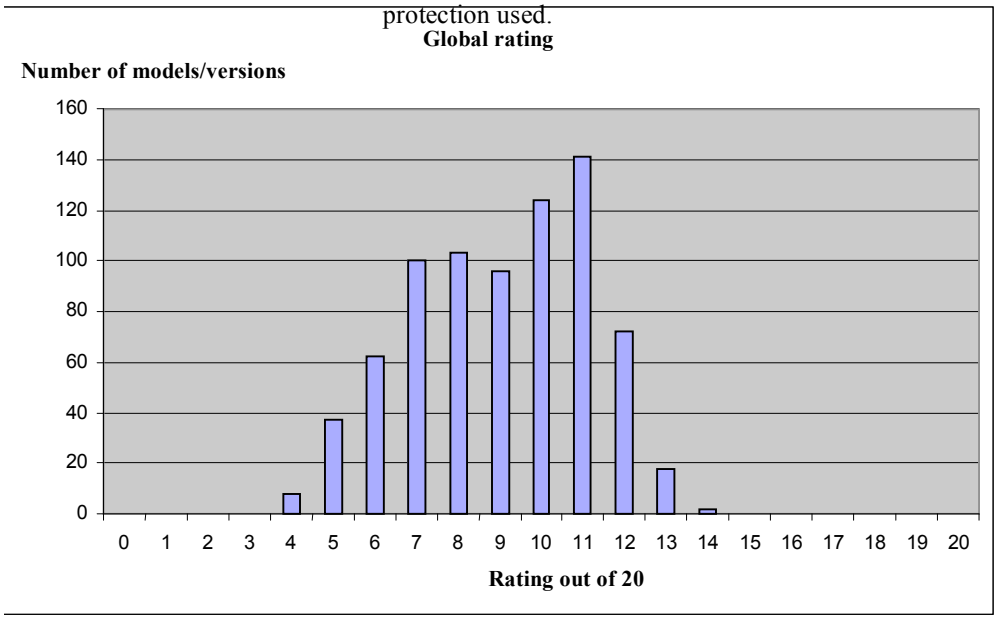

## Distribution of global ratings

Taking into consideration the presence of a particle filter when the information was available to us:

- we noticed that only two vehicles exceed the 14 rating: two versions of the new Fiat Punto whose aggressiveness is low given a mass of almost one tonne and top speeds of 155 and 165km/h respectively. The star-ratings from Euro NCAP (5 and 3) represent the best score possible for this combination of very good occupant protection and good pedestrian protection (52 models/versions of 5 basic models achieved a total of 8, as well as the Fiat Punto; namely, the Citroën C4, the Seat Altea, and 2 Volkswagen models, the Touran and the Golf).

- 19 model/version combinations had 13 or approximately 14. It is interesting to note that a Citroën C4, a considerably spacious vehicle, is classed at the top of this range for a version fitted with a particle filter. The analysis of this example shows how a vehicle can be better than another with good ratings on several axes even if one of them is less satisfactory, without being extremely poor. The C4 diesel with particle filter has a good environmental protection rating and, as we have seen, is among the best for the combination of two protection types tested by Euro NCAP (5 + 3). These three good axes compensate for an excessive top speed (192 km/h) and an already high mass of 1,270 kilos. We also find in this rating range 4 versions of the Honda Jazz, 3 versions of the Volkswagen Golf, two other Fiat Puntos, the 90 cc version of the C4, a Suzuki Swift, a Peugeot 1007, the Prius, and a Citroën C1.

The graph below illustrates the distribution of global ratings including the 4 axes of protection used.




## Practical calculation of the 4 components of the community-friendly ( the global rating

*The rating for occupant protection* can be obtained directly from the Euro NCAP website *www.euroncap.com* or the table we published grouping the values of the 98 vehicles tested since 1 January 2002 and still on the market. The rating out of 5 is equal to the number of stars.

*The rating for pedestrian protection* out of 5 is obtained by the same procedure.

*The rating for the protection of occupants of other private cars* is obtained in two steps. The vehicle's unloaded weight and top speed must be known:

Calculation of maximum kinetic energy in kilojoules:

- multiply the speed in metres per second per second by itself;
- multiply the result by the mass in tonnes to which 0.2 is added;
- divide the result by two;
- if the maximum kinetic energy is higher than 4,000 kilojoules, the rating is zero.

The rating out of 20 is obtained by subtracting 20 from the value of maximum kinetic energy divided by 200 (which means that each 200

This value must then be divided by 4 to obtain a rating out of 5 which will be used to produce a global rating.

*The rating for environmental protection* uses urban fuel consumption in litres per hundred kilometres, whether petrol or diesel. If urban consumption is equal to or higher than 13 litres per hundred kilometres, the rating is zero; for lower ratings the following must be done:

- subtract 3 from the consumption value and multiply the result by 2 (which means that each increase by 1 litre of consumption loses 2 points from the rating out of 20);
- subtract the result obtained from 20 to get the rating out of 20;
- then divide by 4 to obtain the rating out of 5.

**Example**: Citroën C4 saloon, lowest power diesel version (1.6 HDi 92)

We intentionally used this model which has very good results in two Euro NCAP tests and low urban consumption, which compensates for an already excessive speed.

Euro NCAP occupants: 35 points for tests, or *five stars*.
Euro NCAP pedestrians: 22 points for tests, or *three stars*.
Unloaded mass: 1,257 kg, or *1.457 tonnes* with a load of 0.2 tonnes.
Top speed: 180 km/h (*50 metres per second*).

Urban consumption: *5.9 litres per hundred kilometres*.

These five values enable the calculation of four ratings characterising each of these axes, then to find the sum to obtain the global rating.

**Rating 1** (occupant protection) = 5
**Rating 2** (pedestrian protection) = 3
**Rating 3** (protection of other motorists) = 2.73

1/2 (1.457 x 502) = 1,821 kilojoules, or a rating of 20 - (1821/200) = 3.55 with a rating out of 5

**Rating 4** (environmental protection) = 3.55
20 - ((5.9 - 3) x 2) = 14.2 out of 20, or 3.55 with a rating out of 5.

**Total** 5 + 3 + 2.73 + 3.55 = 14.28

Lack of particle filter option = deduction of one point, so 13.28

The 110 horsepower model which may be fitted with a particle filter will not have a point deducted for not having this feature. Its consumption rating is very slightly higher to that of the 90 horsepower version, with its urban consumption rising from 5.9 to 6 litres; its aggressiveness rating will also be higher, having a top speed of 192 km/h. Its ratings are:

**Rating 1** (occupant protection) = 5
**Rating 2** (pedestrian protection) = 3
**Rating 3** (protection of other motorists) = 2.73

1/2 (1.470 x 53.332) = 2,090 kilojoules, or a rating of 20 - (2,090/200) = 10.45 or 2.61 with a rating out of 5

**Rating 4** (environmental protection) = 3.55
20 - ((6 - 3) x 2) = 14 out of 20 or 3.5 with a rating out of 5.

**Total** 5 + 3 + 2.61 + 3.55 = 13.88

In other words, the 90 horsepower model has lost more points on its overall rating due to the lack of a possible particle filter system than it has gained by its consumption being slightly lower and its top speed being 12 km/h slower than that of the 110 horsepower model. ■

# ❑ Appendix II: speeches from 19 April 2005 for the presentation of the community-friendly car

## Reasons to act

***Geneviève Jurgensen, Spokesperson for the LCVR***

For once I am only going to talk to you about figures.

I am going to use these figures to respond to those of you who think that we are being excessive and that the question of road safety, with 5,200 deaths per year, is under control.

We think that the road safety issue is only just beginning. It is less about transport than it is a matter of public health: a much more crucial issue since, as is common in the area of public health, it is the poor that suffer first. In the circumstances, it is the rich who make them suffer.

WHO has highlighted this, by reporting on the loss of human lives in terms of the number of inhabitants. Today, I propose to report this in terms of the number of vehicles on the road.

For one million vehicles, approximately 173 people die in France each year.

For one million vehicles, 1,700 die in Tunisia.

For one million vehicles, 5,000 die in Cameroon.

In the developing countries, 3 times out of 4 the victim is a pedestrian or cyclist, whether adult or child. Victims of speed, of course, and of the weight of the car. They have no chance.

The wealthy countries have set an example which developing countries have modelled themselves on: they have produced pointlessly heavy and fast cars. Moreover, they have produced cars with such high consumption levels of non-renewable energy that they have clearly expressed their idea of freedom: to be free to consume without restriction the resources which their own children will not have.

The car industry is an exportation product varied in terms of make but standardised in terms of form. In a country which is very poor but democratic and highly educated, such as Uruguay, only 30,000 vehicles are bought each year; but buyers are attracted by 40 different makes.

To save ourselves and those who can still be saved, the League Against Road Violence is working on drawing up a Citizen Car seal. It is an emergency, and this act is in keeping with the pioneering tradition of our association. We know that with your help we will succeed, and that this seal will go beyond the borders of France.

## Complementary courses of action

***Claude Got, CNSR expert***

### Speech 1

When the members of a civilised and responsible society notice a serious drift which is dangerous for people and the environment, they have three possible courses of action:

To take personal action against those responsible by using the penal code when they have been victims of the passivity of organisers of a system with avoidable risks. This appeal to

the penal process is based on the notion of a non-intentional crime and homicide by imprudence. Those responsible know that pointlessly fast vehicles are also pointlessly dangerous but do not take action. Such a procedure was employed by a family, a member of whom had been killed in an accident caused by a vehicle travelling at a speed far exceeding the maximum speed authorised in France.

To take action on a governmental level by using the administrative procedure. The regulation does not respect article L-311-1: "*Vehicles must be built, sold, operated, used, maintained and, where appropriate, repaired in such a way as to ensure the safety of all road users. Decrees approved by the Conseil d'Etat [Council of State] set the conditions of application of the present article.*" An association was established to lodge an appeal before the Council of State, to ask it to assess the contradiction between article L-311-1 and the issuing of registration certificates to vehicles which have not been "*designed to ensure the safety of all road users*" (this appeal was lodged in September 2004; the file can be seen on the website *www.apivit.org*).

To take action on a society level by defining the characteristics of a "community-friendly" car, maintaining the freedom of autonomous movement ensured by a private vehicle and respecting others and reducing environmental damage. This is the objective targeted by the League in collaboration with experts whose task is to make their knowledge available to society.

These three procedures are not mutually exclusive; on the contrary, they complete and reinforce each other.

## The route chosen by the League

***Chantal Perrichon,***
***President of the LCVR***

For twenty-two years, the LCVR has contributed to progress in the area of road safety by all legal means possible. One of the victories we can be legitimately proud of is the law of 1990 which makes the use of rear seat belts and appropriate restraint devices for children obligatory. This measure, which has saved many lives and will continue to do so, as nobody would dream of denying, is a typical example of our method and could illustrate the first step towards the Citizen Car seal which brings us here today.

Once we are certain of the validity of a choice after having consulted recognised experts in the field, we spread the idea, the concept, via the media whilst bringing into play concrete and educational action. Thus, since the end of the 1980s, we have been led to the setting up of a lending network for thousands of child carriers in the *départements*. This operation has been relayed by the press for the most part and so well that, when it came to voting on a legal text, opinions were there ready.

Today, we think, along with 72% of French people, that codes of conduct in society should ensure respect for life and should be imposed on the construction of cars and tourism. Car and motorcycle accidents are the primary cause of death in adolescents and young adults in our country. Moreover, the car contributes towards the planet's climate being destabilised and non-renewable energy sources being exhausted.

We are neither car haters nor car lovers; we are just working for an equal policy for public and private modes of transport in accordance with the service they provide and the drawbacks they entail, in both the short and the long term, without being restricted to accidental risk.

Since consumers no longer want to be forced to buy pointlessly fast cars, we want to reverse the process by creating a Citizen Car seal which will be understood universally; an emblematic form for the battle against the prevailing lack of public spirit, which will facilitate and orientate buyers' options.

Like other means of transport, the family or individual car must display features that combine the best service for the least resultant risks; hence our refusal of vehicles that are still too heavy, still too fast, and therefore more aggressive to other users and the environment.

Classification for the Citizen Car takes into consideration:
- the protection of occupants;
- the protection of external users;
- pedestrians, cyclists, two-wheeled vehicle users;
- other motorists (compatibility);
- the protection of the environment;
- production of carbon dioxide;
- production of particles;
- production of pollutants;
- noise;
- recycling.

The results obtained will ultimately enable users to redirect their demand towards vehicles adapted to their requirements and hence to promote the construction of these products. It may also be the tool allowing for the founding of a "bonus/malus" type regulation.

Michel Gardel, Director General of Toyota France, recently declared in an interview that the Prius had been launched in 1997 because the Japanese are very sensitive to their environment: they do not have any energy resources and are waging war against wastage. We would like to hear the car manufactures opt for the community-friendly car, not only to fight against economic waste but also, more fundamentally, to put an end to this wastage of lives!

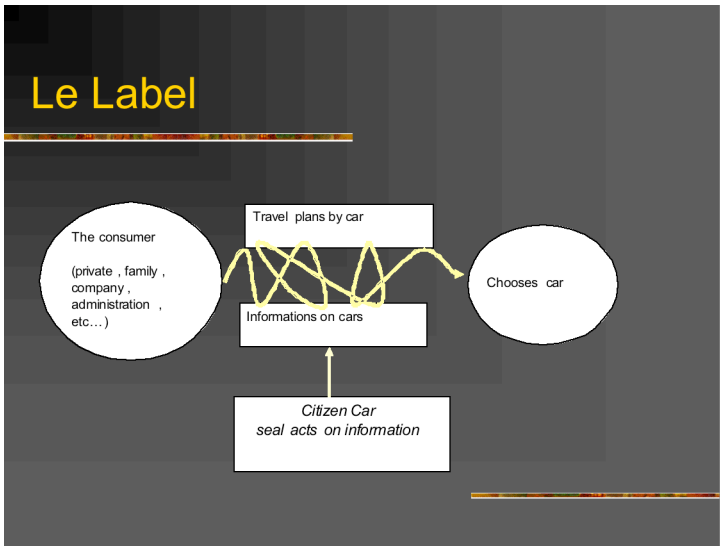
I now wish to thank our partners who, on the brink of this great change, are not content to just show polite interest in our initiative but seek to see this project through completely. They include, amongst others, MACIF, ASFA, the Red Cross, Norauto, etc. Thank you for having supported us in this pioneering initiative!

## The components of the Citizen Car seal

***Vincent Spenlehauer, Director of research, INRETS***

To simplify, the consumer - regardless of whether private, family, company, administration, etc. - chooses a car by relating his plans for travel to all information on cars available to buy on the market.

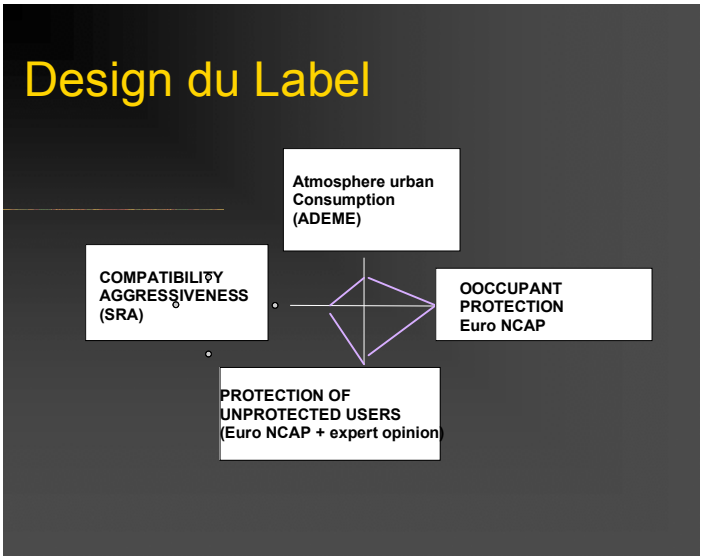
The purpose of the Citizen Car seal is to act on this corpus of information. The seal aims to see to it that the least effort possible is required of a consumer more or less complying with the idea of a community-friendly car to obtain information allowing him to develop his choice for a community-friendly car.




The first thing to know regarding what the seal will actually be, i.e. what type of information it will circulate to potential buyers of community-friendly cars, is that the seal does not come out of nowhere. The seal capitalises on the knowledge and corpus of specific, relevant information which already exist. Thus, the seal is partly founded on the public results from the Euro NCAP tests which are proving to be completely indicative of the degree of protection offered by a car to its occupants.

However, the seal completes and clarifies, where necessary, certain knowledge and corpus of relevant information which should be completed or clarified. In fact, the Euro NCAP tests, for example, say nothing about the dangerousness of a car in relation to other cars on the road. Therefore, these must be completed. The SRA association (Car Safety and Repair), like the FFSA (the French Federation for Insurance Companies) and GEMA (the Economic Group for Mutual Insurance), now regularly sets out an equation to allow vehicles to be classified according to their potential loss, suffered and/or caused. Nevertheless, despite very detailed information, particularly on a car's aggressiveness in relation to others, this equation is not very intelligible to anybody not wishing to spend their evenings doing calculations. Some clarification must be given for this information to serve as a support for the seal.

In fact, the truly innovative nature of the Citizen Car seal is that it wants to collate all the major aspects of a community-friendly car into a simple form, intelligible and accessible to all. For the moment, the working group has decided to base the Citizen Car seal on four major evaluation criteria as below.




## The "occupant protection" aspect

***Claude Tarrière, President of ITRA (Technical Institute for Accident Reconstruction)***

This concerns the occupants of a car subjected to the classification of "community-friendly cars".

Euro NCAP, or the European New Car Assessment Programme (since 2002), set up on the joint initiative of administrations ("road safety" in France) and large European associations (ADAC in Germany), subjects each car to a series of three complementary crash tests and to specific impact tests.

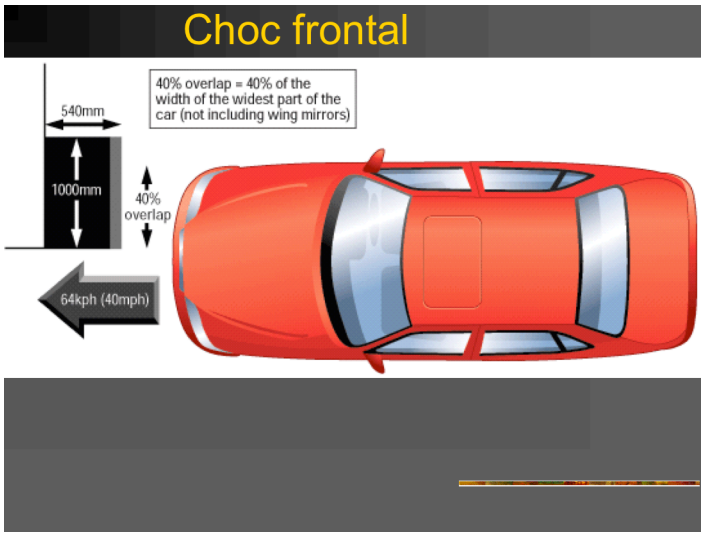
The current president is Claes Tingwal from Sweden.

Two French vehicles are presented which have obtained the best ratings (5 stars): the Renault Modus and the Citroën C4.

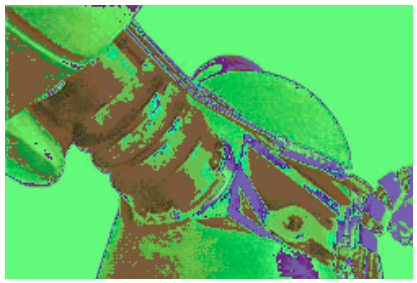
**Aspects covered by Euro NCAP**

- Frontal impact
- Side impact
- Pole test
- Pedestrian impact (adult and child)
- Protection of children tested by the efficiency of restraint devices proposed by each manufacturer

Only the first two tests are used for regarding occupant protection.




Frontal impact takes place against a fixed, deformable barrier at 64 km/h. The overlap of the obstacle by the car is only 40% of the car's width, which increases the severity of the impact in terms of the structure enduring.



Two dummies are used to represent the driver and front passenger. The Hybrid 3 type conforms to the best model recommended on an international level.

The instrumentation consists of 36 measurement channels for each dummy, i.e. 72 in total, to which six to nine channels must be added for each child dummy used in the back.
The entire process is completed with two accelerometers fixed to the non-deformed part of the

**Parts of the body protected**

The parts of the body evaluated by the instrumentation for the level of protection are coloured as follows:
- Green: No risk of injury
- Yellow: Moderate risk of injury
- Red: Risk of serious and fatal injury

**"How do Euro NCAP results correlate to real life injury risks - a paired comparison study of car-to-car crashes" The cars with three or four stars are approximately 30% safer, compared to two star cars or cars without a Euro NCAP score, in car to car collisions.** ***Key words: Accident analysis, crashworthiness, injury probability, statistics, Euro NCAP***

This is taken from a Swedish publication which shows that vehicles performing best at Euro NCAP tests (3 or 4 stars) are approximately 30% safer in actual car-to-car collisions that those with only 2 stars.

## The limits of Euro NCAP

- Euro NCAP only concerns the protection of occupants in the vehicle tested.
- It does not take into consideration the protection of occupants of other vehicles such as the oldest cars and especially the lightest.

## Why?

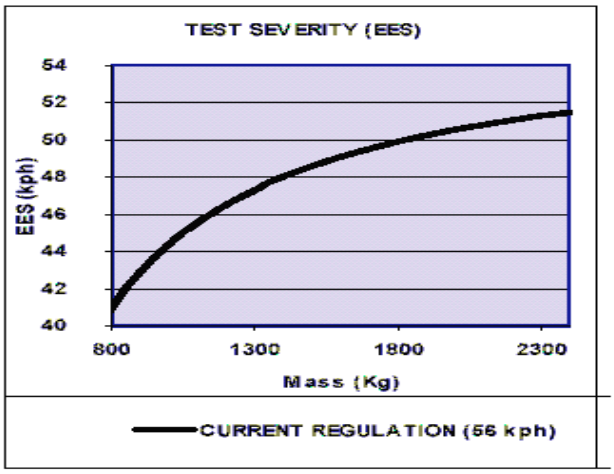



*Figure 1: Severity for a vehicle vs its*

This graph, from Pascal Delannoy's publication 04B-160 'New Barrier Test Assessment Protocol to Control Compatibility", illustrates the fact that the severity of a collision expressed here in terms of EES (Equivalent Energy Speed) increases significantly with the mass of a vehicle.

Consequently, Euro NCAP is pushing for structures to be more rigid for all vehicles and, unfortunately, as much for the heaviest vehicles as for the lightest. This will contribute towards an increase in the aggressiveness of the mass and rigidity of the heaviest vehicles.

Discussions are underway within Euro NCAP itself to resolve the problem by adopting another type of barrier.

What is the solution as it stands? It is to test and rectify this negative effect by evaluating vehicle aggressiveness based on mass, power and possible top speed according to a mathematical formula proposed by certain French insurance companies. This is the purpose of the "compatibility" axis used for the "Citizen Car" project.

## The "unprotected road users" aspect
***Claude Got, CNSR expert***

Assuring the protection of vulnerable users, i.e. those not protected by bodywork, is an aspect of community-friendliness which cannot be conceived without respect for others.

In 2003, the number of these users killed on the road was as follows:
Pedestrians: 592
2 wheels:
- Cyclists: 190
- 2 wheeled-vehicles: 1,185

Total: 1,967 = 34.3% of those killed

To take into account the aggressiveness of the front of vehicles for these users, the simplest and quickest technique is to use Euro NCAP's tests which aim to evaluate the protection of pedestrians.
- The advantages of the method are obvious:
  - it already exists;
  - the results are available for the most wide-spread vehicles;
  - it is selective (no vehicle attains the maximum of 4 stars);
  - the test procedure and its results are published.

- However, it does have its disadvantages:
  - it is not a test incorporating the entire relation between a pedestrian and a vehicle;
  - the significance of the form of the front of the vehicle is underestimated;
  - the results are not validated by accidentology (it is impossible to compare a vehicle to a pedestrian when tests concerning collisions between vehicles allow for comparisons which validate the tests carried out).

The group will therefore have to make its decisions knowing that using existing tests is indispensable for rapidly producing a "score" for the protection of vulnerable users. New, validated elements being available would then enable completion. It is also foreseeable that Euro NCAP tests could be completed with relatively simple requirements (fixing a maximum height for the bonnet, a certain distance from the front surface of the bumper).

## The "compatibility between vehicles" aspect
***Hélène Fontaine, Director of research, INRETS***

Vehicles' weight and impact speed determine the energy released during an accident. They strongly influence the severity of the consequences. In the event of a collision between two road users, it is useful to distinguish between the internal severity, i.e. the protection of the occupants, and the external severity which represents the aggressiveness of a vehicle towards other users (pedestrians, two-wheeled vehicles, or other vehicles). The global protection offered to vehicle users has long been prioritised, even if the concept of compatibility only appeared at the beginning of the 1970s. As with other risk issues, road safety must differentiate between these two forms of accidental risk: that inflicted on ourselves by our choices, and that inflicted on others.

The question of compatibility between vehicles may be studied from different angles:
accidentological, experimental using crash tests, or even simulative. Several works have been carried out on this matter, particularly in France by researchers at the Renault Peugeot laboratory and INRETS.

Thus, following on from INRETS, Martin et al (2003) analysed the state of the drivers of two private cars involved in a collision, using accident data from 1995 to 2000, to estimate the influence of weight and the age of the vehicle on the severity of the consequences. Adjusted to the wearing of seat belts and the type of impact (frontal, side, rear) the relative risks obtained are considered "on a par with the impact". The results obtained show, for example, that when a private car weighing less than 800 kg and one weighing over 1,200 kg collide, and one of the drivers is killed and the other injured, it is 25 times more likely for the driver of the lighter vehicle to be the one killed. These results take into account the vehicles' ages, with more recent vehicles having a better level of protection.

The development of vehicle structures and ever more equipment being fitted for safety and comfort result in the production of heavier and heavier cars. This steady increase in vehicles' weight, as well as the progressive disappearance of slow vehicles, will modify the relative risks that can be calculated by comparing the damage caused to the slowest and lightest vehicles by the fastest and heaviest vehicles. It is therefore appropriate to regularly update all the data, to

establish new weight and power classes to follow the development of the fleet, and to publish them by distinguishing between the damage caused to the occupants of one type of vehicle and users outside the vehicle, whether pedestrians, two-wheeled vehicle users, or users of vehicles with different masses and powers.

## Analysis of intervention

***Guillaume Rosenwald, FFSA***

In its initiative to focus on the characteristics of "community-friendly cars", the LCVR is working on an indicator of the dangerousness of vehicles on the road. This research comes close to the requirements for insurers of motor vehicle liability when they have to evaluate the risk represented by a vehicle-usage-driver profile. Insurance companies on the French market have asked their technical organisation, SRA, to set up a database on vehicles on the road and a formula optimising information on the dangerousness of a vehicle as separately as possible from usage and drivers.

A new formula was established three years ago by SRA to disassociate the "vehicle" effect from other factors regarding dangerousness.

It must be highlighted that this initiative by the insurance companies is global and analytical as far as all the consequences of an accident are concerned, since insurers of motor vehicle liability compensate as many vehicle passengers as other road users, passengers of other vehicles, cyclists or pedestrians.

The formula focused on by SRA principally uses three indicators:

- the vehicle's power/mass ratio;
- the mass of the vehicle as a danger factor for third parties;
- the given top speed of the vehicle.

These three factors were weighted in order to better differentiate vehicles according to their dangerousness. The SRA classification used by insurance companies also includes a rating on design, taking into account active safety equipment and crash tests as regards passive safety. This rating enables significant improvement of the classification of the best equipped vehicles in terms of security. This design rating is only partly based on insurance companies' observations as it takes into account new equipment, the positive effect of which has not yet been measured. In the step to combat road violence certain elements of this rating may be duplicated with the indicators chosen by the League as regards protection of vehicle passengers.

The classification of vehicles carried out by insurance companies is public and can be consulted on the website www.sra.asso.fr

## The "atmosphere" aspect

***Jacques Beaumont, Director of the research unit "Laboratory of transport and environment", INRETS***

In my speech I would like, first of all, to discuss two topics relating to transport environment: noise and air pollution; and secondly to present the need for a global (systematic) approach.

### Noise

For thirty years, the French people's exposure to noise has not decreased. Noise is a non-negligible source of stress - it is in fact the second, after financial worries.

It can interfere with sleep. Certain economists estimated the cost of damage caused by noise at 10 billion francs per year, or 0.12% of GDP.

The development in European infrastructures and the changing of the time scale have reinforced the effect of noise and reduced the nightly lull. In urban areas, whilst "black" areas (Leq > 70 dB(A)) are in regression, the grey areas are slightly increasing and we tend to forget the quiet areas (Leq < 55 dB(A)).

This is a paradox as regards the progress achieved by manufacturers under the constraint of European demands. In fact, one of the first European demands concerned noise and, in particular, the noise from engines. In 20 years, the saving achieved was 11 dB(A) for heavy vehicles and 8 dB(A) for light vehicles - which corresponds to a ratio of 1 to 10. However, this saving has not been perceived by residents. There are, in fact, two sources of noise: the noise from the engine at low speeds (< 50 km), and the noise of tyres at higher speeds. The improvement in engine noise has emphasised the tyre noise, which requires more investigation - in terms of tyre/road contact and also wheel/rail contact, for example.

We often talk about roads not being very noisy, but the sound of the tyres is greatly affected by the increase in speed; and the current protection methods used with constant efficiency, such as acoustic screens, raise several problems when used in urban areas and also invoke certain reservations in terms of visual intrusion. In the end, the acoustic isolation of facades - the last resort - is conditioned by closing windows, which is barely accepted to date.

### Air pollution

For the issue of air pollution, a distinction is made between local pollution (emissions of the pollutants CO, HC, $NO_x$), and global pollution (emissions of $CO_2$).

Regarding local air pollution, emissions have been reduced dramatically - reaching a ratio of 1 to 10 in some cases - to such a point that metrology has become complex. In any case, the population's awareness and sensitivity have increased and air pollution remains a major concern in terms

of health - even if there are still not enough epidemiological studies to provide definitive conclusions. Yet even if the risk is low, it still exists. If we examine the emissions of pollutants, it can be considered that advancements in terms of reducing emissions will be very favourable in 2020 as far as carbon monoxide and hydrocarbons are concerned, and favourable for nitrous oxides and particles (due to filters which are already efficient).

On the other hand, advancements seem somewhat less favourable if we examine global pollution, i.e. emissions of $CO_2$. In fact, emissions of $CO_2$ are directly proportional to fossil fuel consumption and greatly affected by the increase in the number of kilometres travelled. Today, a slow but continuous increase in road traffic seems highly probable. A certain number of simulations show that the global increase in $CO_2$ emissions will constitute between 15, 20 and even 40% for some by 2020, according to maintained hypotheses (regulatory threshold values or values related to usage cycles).

It is not necessary to recall the significant contribution of $CO_2$ to what is known as the greenhouse effect in relation to transport systems (27% of the sector is increasing) and France's commitments on this issue: Kyoto - reduction in emissions by 1 to 4 by 2050.

### Means of reduction

On the one hand, highly significant technological progress is expected over the next ten years or so, in terms of traditional motorisation, fuel and hybrid motorisation; namely optimisation of thermal engines and fuel cells further in the future.

On the other hand, the issue is the organisation of transport in terms of mobility, intermodality, urban travel and tariffing, with the contribution of new information technologies.

Technology will not provide a solution for all problems, at least not in the area of the environment. A recent survey by the OECD estimates that technological progress may result in 40 to 50% improvement, mobility contributing 20% and intermodality also 20%. Greater consideration must be given to the relation between mobility and economic growth in a sustainable environment, which is not necessarily a linear function.

If we think of some average values in terms of efficiency to date for the means for reducing noise disturbance:

- an "acoustic" road covering improves the situation by 5 dB(A) when fresh, compared to a traditional road surface;
- an acoustic screen, preferably absorbent, will result in a reduction in the constant noise level from 8 to 10 dB(A);
- reinforcing noise isolation of facades (or, more precisely, the building envelope) could enable a performance of 40 dB(A) compared with 28 dB(A) with current usage. If we consider reduction in disturbances due to air pollution, two paths are open to us: the technological path and the path of transport organisation in the broad sense.

Finally, making the population aware and changing the conduct of individuals is the strategic path of progress that must not be forgotten.

### Global approach

In the area of transport, environmental constraints are strict and are often a key element in technological advancements and organising or planning projects.

Moreover, the impact on the environment is often very high, diverse and sometimes antagonistic. This explains the emergence of a strong demand from politicians, decision makers and local authorities etc. for an evaluation and assistance tool for decision making, combining simplicity of application and validity; for example a system of environmental indicators of associated impact.

To conclude, an environmental approach as I see it requires a systemic approach, taking into consideration the complexity and interaction of effects generated by disturbances connected with transport; in contrast to preceding monothematic approaches which are easier to express but not very realistic. The notion of sustainability is also to decline in an environmental sense. This deserves a new approach, in particular to better evaluate and simulate future developments.

## Other components of the seal

***Vincent Spenlehauer, Director of research, INRETS***

Even now it may be useful to remark that the seal does not deal with the issue of drivers' conduct. That said, it is highly probable that in distributing the seal we are reminding those who have forgotten that a community-friendly car should be driven in a community-friendly manner otherwise we are verging on the absurd. For example, fully inflating tyres is a matter of community-friendly conduct, whether in terms of noise, pollution, or risk of tyres bursting and therefore causing an accident.

Since we have mentioned the issue of noise, which is a road disturbance that must not be neglected at all, it should be known that cars have seen great progress in terms of sound over the last six years. Consequently, silence aspects are to be sought in road coverings or drivers' conduct (reduction in speed, less nervous driving, etc.). In other words, it would scarcely be sensible to create a "noise" aspect to the Citizen Car seal, but it is probably sensible to detail this, even if only for educational purposes.

Raising the issue of nervous driving leads on to automatic gearboxes, *a priori* considered as calm driving (which is not so simple, given that many sports cars are sold fitted with

automatic gearboxes because of the difficulty of controlling their excess power). More generally, the "Citizen Car" working group is still considering the possible incorporation of a "safety equipment" aspect to the seal. The problem is that, in general, few scientific studies establish security characteristics for equipment offered by manufacturers, without counting the "over-compensation" phenomena (i.e. 'I accelerate because I have ABS") that this equipment can introduce. In any case, the group will have a clear stance on this matter.

## The structure of the seal

***Michel Ternier, CNSR expert***

During the meeting of 19 April, the reflection group on the community-friendly car presented its work on the invitation of Rémy Heitz, Inter-Departmental Delegate for Road Safety.

The many guests present participated in a lively and constructive debate. The group will follow up this project with contributions from many partners and experts.

An initial conclusion from 19 April is essential: the project is important. It is of interest to organisations affected by road safety, consumer organisations and public authorities.

The community-friendly car project is also of interest to car manufacturers because only the concept of the community-friendly car, in the long term, will enable sustainable development of motor vehicle transportation on a global scale. If they asked their colleagues to decline LCVR's invitation that day, it may be because they have yet to understand the spirit with which this reflection is made.

The reflection group will therefore channel the four aspects of the community-friendly car:

- compatibility aspect between vehicles (11 May);
- unprotected road users aspect (25 May);
- atmosphere aspect (21 June);
- occupant protection aspect (6 July).

The necessary information to advance reflection on each of these aspects is available. This information must be comprehensible and its coherence assured; the necessary experts are mobilised. Conclusions will be available for autumn 2005.

The project was announced to CNSR to whom it will be referred, to a committee of experts and the motor vehicle commission.

Let us add another aspect, that of the community-friendly usage of the car…

Everything is set for 2006 being the year of the community-friendly car. ■

# ❑ Speech by Mr. Dominique Perben Minister for Transport, Infrastructure, Tourism and the Sea

**VERONA 2005**
**Verona, Friday 4 and Saturday 5 November 2005**

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Ladies and gentlemen,

I am very happy to be here with you today at the third conference in Verona, and I warmly thank my friend Pietro Lunardi for welcoming us here.

This round table on "Today's drivers" gives me an opportunity to share with you the considerable progress of French drivers and the change in their conduct since road safety was declared a "national cause" by President Chirac.

The course of my speech will be based on: "today's drivers: new standards, new values".

**In fact, new standards have significantly changed the conduct of French drivers**

The impulse given to road safety by the President of the Republic of France on 14 July 2002, enables us to record significant results today:

- in 3 years, more than 6,000 lives have been saved, and approximately 100,000 injuries avoided. The number of victims killed today on the road is historically the lowest since the first statistics were recorded on this issue (in 1956, the first year of reference, there were 8,863 deaths). The ambitious target of less than 5,000 people killed on the road in 2005 is now within reach, if the French maintain their efforts;

- we are convinced that we can go even further.

• It is thanks to the development in conduct and hence to the individual response to the regulation that, since 2002, the situation has changed so much.

• We have listened to the messages addressed to us on the weaknesses of our control measures and offence sanctioning:

- The report was overwhelming: the probability of being checked and effectively sanctioned in the event of fault was the lowest in Europe. We immediately set to work to give force and credit back to the legal state on the roads by assuring more stringency.

• The progress recorded on speed, mainly thanks to the development of automatic controls, on alcohol, and on the wearing of safety equipment, was substantial:

- These results are largely due to automatic speed cameras which we continue to deploy in accordance with our objectives. 850 speed cameras are in service as I speak. Their number will increase to 1,000 by the end of the year and a further 500 new devices in 2006.

- We are supervising the improvement of these control devices towards a much more equal treatment of users, and working tirelessly towards education, conditioning acceptance by citizens;

- In this respect, one criticism often addressed regarding so-called preferential treatment benefiting drivers from bordering countries will soon be without cause. Over and above the agreement already signed between France and Luxembourg, the Minister of Justice, at the request of the French President, is working until the bilateral agreements on tracking offenders are signed with all the countries neighbouring France by the end of 2006.

• **The struggle against the most dangerous forms of conduct** which are still irreducible will continue to intensify, focusing on road users and in particular "two-wheeled vehicle" drivers.

My ministry has submitted a draft bill on "the safety and development of transport" which is under parliamentary discussion. I hope it will be adopted by the end of this year. The aim of the bill is to facilitate the immobilisation and confiscation of vehicles on the grounds of excessive speed (> 50 km/h above the authorised speed).

• The spirit in which we are working, with my colleague the Home Secretary, is not to trap or harass drivers but to combat the principal factors causing accidents and the primary causes aggravating these.

• Today, we are intellectually ready for such a change to become established sustainably and for **a new culture to settle in our country, a culture of road safety.**

* * *

## New values are emerging and at the same time transforming our relationship with the road

• We are seeing a federative subject arising in France which, for me, summarises what is essential: the reinforcement of road community-friendliness. Of course, this issue encompasses in the first instance the question of the "community-friendly vehicle": more respectful of the environment, better protection for its occupants, occupants of other vehicles and the most vulnerable road users (pedestrians and two-wheeled vehicle users).

I am convinced that buying a vehicle in the future will be dictated more and more by "community-friendly" motives, and less and less by the considerations of power and speed.

• **As far as vehicles are concerned**, the French government

will be taking all measures necessary to promote equipment facilitating respect of the regulations and assuring better protection for users:

- we want to obtain a generalisation of deliberate speed restriction as soon as possible on all new vehicles, in the knowledge that this measure has already met with great success;

- the usage of specific daylight driving lights would also enable drivers to be seen better without dazzling and without excess fuel consumption. France also hopes to promote installing this system on all new vehicles.

• Yet the question of road community-friendliness far exceeds the vehicle issue: it also touches on the response to the regulation, on respecting the regulations and especially on respecting others around us.

• The safety of users regardless of their mode of transport is my absolute priority. **In the design, renovation and maintenance of infrastructures**, we should favour calm conduct and a harmonious sharing of the road for all users, together with all those in charge of highway management, especially local authorities.

## "The road is not taken; it is shared."

• France has long been behind in Europe with regard to road safety matters.

• Today, France is playing a very significant role in the European Union's objective of halving the number of deaths by 2010, contributing towards 38% of this reduction as reported within the EU (with 15 Member States) between 2001 and 2004.

We are fully determined to continue this initiative.

We are therefore going to do all we can to ensure that our citizens maintain this conduct of greater respect towards regulations, themselves, and others. ■

# ❑ Read for you:
## How to kill the State *(published by Éditions Bayard)*
## Evaluation of public health *(published by Éditions P.U.F.)*

***The author, Claude Got, honorary professor at the René Descartes University of Medicine, has carried out many studies on public health. He is also a member of the expert committee for the French National Council for Road Safety (CNSR) and chairman of the scientific committee of the French Monitoring Centre for Drugs and Drug Addiction (OFDT).***

### How to kill the State

Slaughter in Nanterre, asbestos, doctor shortages, the Perruche case, racist pseudo-aggression on RER D [line D of the regional express rail], killer cars… Certain reactions or the lack of reaction from public authorities can prove to be ill-adapted and even culpable. How can we distinguish between doctrinal errors and the more numerous errors which betray a lack of know-how? Does the perversion of the system prioritise motives which are not apparent in the decision-making process?

The author gives twenty-two examples from recent news reports to differentiate the two main errors at work: the malpractices resulting from incompetence, and malpractices which display the capacity to do wrong. They may even be interlinked. We must understand the faults committed by organisations that control the country in order to prevent a deterioration in their function. Failing to recognise and treat the dysfunctions of the State may entail serious deteriorations in our democracy. This book offers a practical and modern vision and the means for remedying it. ■


**CLAUDE GOT**
**HOW TO KILL THE STATE**
**SYNOPSIS OF MALPRACTICES AND MISCONDUCT**

### Evaluation of public health

In twenty years, the notion of health and safety has been seriously brought into question by a series of cases of insufficient expertise and management regarding new illnesses, such as AIDS, or risks that were known but whose seriousness was underestimated, such as the risks associated with asbestos. In the face of such upheaval in the notion of public authorities' responsibilities, evaluation of public health has developed.

This work offers a very precise vision of the problems of evaluating public health. It explains the roles of evaluation in public health, what we can expect from it, and what its ethics should be. ■


**EVALUATION OF PUBLIC HEALTH**
**CLAUDE GOT**