

# To the point 3

Studies on "Drive like a pro –  
safe driving, both in a professional and a private context"



 UK|BG  
Unfallkassen und  
Berufsgenossenschaften

 DVR

Deutscher  
Verkehrssicherheitsrat e.V.

Insights and results pertaining to preventive action in the future

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# 1. Preface

Since the recent massive price increase of raw materials, the focus on saving fuel has increased. Apart from improvements in automotive engineering, special importance is now being attributed to driving techniques that help save fuel. Nowadays, teaching a driving style which contributes to this goal has become a mandatory part of driving instruction in Germany.

Apart from financial savings and lower emissions, a relaxed, proactive and therefore fuel-saving driving style has another major benefit: It increases road safety. That is the reason why the German Road Safety Council and its international partners have been promoting eco-driving practices for many years now.

Programmes such as the "fuel-saving driving lesson" and "drive safely and save gas along the way – safe, economical and environmentally friendly driving" are designed to teach energy-efficient driving techniques in order to reduce fuel consumption and carbon emissions as well as to increase road safety. To validate the effects of the measures taken, the trainings have been evaluated several times over the past years. Studies were conducted to review the results of the training courses both qualitatively and quantitatively, and these results were used to derive criteria on how to structure future programmes for example. The international partners of the scheme have also had scientific studies done repeatedly to reassess their training programmes.

**"To the point 3"** gives an overview of the most important research findings with respect to eco-driving trainings. These include observable long-term effects in the behaviour of the participants in the trainings, such as changes in driving style, as well as measurable fuel savings. Without exception, the studies reveal that the trainings have great potential in making road traffic safer, more economical and more environmentally friendly. The concluding chapter deals with the market opportunities of eco-driving trainings and with possibilities of communicating their potential in the best possible way in the future.

In the course of the text, the motto of the campaign, "drive safely and save gas along the way – safe, economical and environmentally friendly driving" ("Fahr und spar mit Sicherheit – sicher, wirtschaftlich und umweltschonend fahren" in the German original) has often been abbreviated as "SWU".



# **1. The training programme "drive safely and save gas along the way – safe, economical and environmentally friendly driving"**

## **1.1 Qualitative, depth psychology-oriented impact study on the BG/DVR training "drive safely and save gas along the way – safe, economical and environmentally friendly driving" and its implementation in companies by certified DVR instructors**

**Guido Lessenich, research into the psychological impact of the SWU training, August 2000, on behalf of the German Road Safety Council**

### **1.1.1 Background and objective**

The present study was designed to examine the impact of the SWU training. The results will be used to give recommendations on how to improve the training in the best possible way.

### **1.1.2 The training model under examination**

The basic principle governing the "drive safely and save gas along the way" scheme is the fact that a more economical way of driving increases road safety and helps to preserve the environment. The training, which is carried out in the most pragmatic way, is meant to teach participants the skills that they require to reduce fuel consumption in the professional as well as the private domain. Therefore practice drives are not conducted in a learner driver training area but in everyday traffic. If possible, these drives are performed in the service vehicle normally used by the driver, or they are even integrated in the daily workflow.

#### **Training topics include:**

- Drive at low engine revolutions and shift up as soon as possible
- Use momentum and take advantage of built-up energy
- Create scope for decision-making – preserve your "competence to act"
- Switch off the engine whenever and wherever appropriate
- Check the tyre pressure frequently
- Remove surplus weight
- Drive in a relaxed way

At the time of the study, three different versions of the SWU training were in existence. As one of the versions had failed in practice, it had already been eliminated. In the following, only the two remaining versions will be analysed:

- "On-the-job"-training for 45 minutes, with one participant and under realistic working conditions.
- Practice drive in two groups of 3 participants each, 45-minute intervals, alternatively with or without an instructor.

### **1.1.3 Study design**

Approximately two-hour non-standardized interviews with a depth psychology / psychoanalytical orientation were conducted with 31 participants who drive frequently as part of their job. All the test subjects had undergone a SWU training. The survey structures and sums up major psychological motives with relation to the SWU training according to their importance and recurring basic patterns.

## 1.1.4 Results

### 1.1.4.1 Driving as part of the job requirement

The journeys of frequent drivers are determined by their job situation. Two basic attitudes have been identified which determine how these drivers experience and behave in everyday traffic. One type of driver participates in daily traffic with a high degree of tension and assertiveness as well as a high willing-

ness to engage in confrontation; he is mostly controlled by others and suffers from stress and time pressure. The other type experiences everyday traffic as a haven and a protected space where he feels comfortable. His driving style is defensive and smooth. Great time pressure is particularly experienced

by those drivers who drive short distances to frequently changing destinations. Drivers who cover longer distances to destinations they are usually familiar with tend to be more relaxed. On the other hand, they show a greater inclination for daydreaming while driving.

### 1.1.4.2 Access to the training

In conformity with its motto, "drive safely and save gas along the way – safe, economical and environmentally friendly driving", the training is perceived as a safety training in the classical sense. However, the false expectations raised by this misconception are ultimately thwarted and this has an adverse effect on the motivation of the participants.

#### Other premises of the SWU training which prove to be counterproductive:

- Many participants take part in the course because they are required to attend. Their participation is neither voluntary nor are they given appropriate advance information.
- The test subjects had to take a leave day to participate in the training, or the course took place over the weekend.
- The training course was offered as a side event to the company's annual general meeting.
- Lack of readiness to change

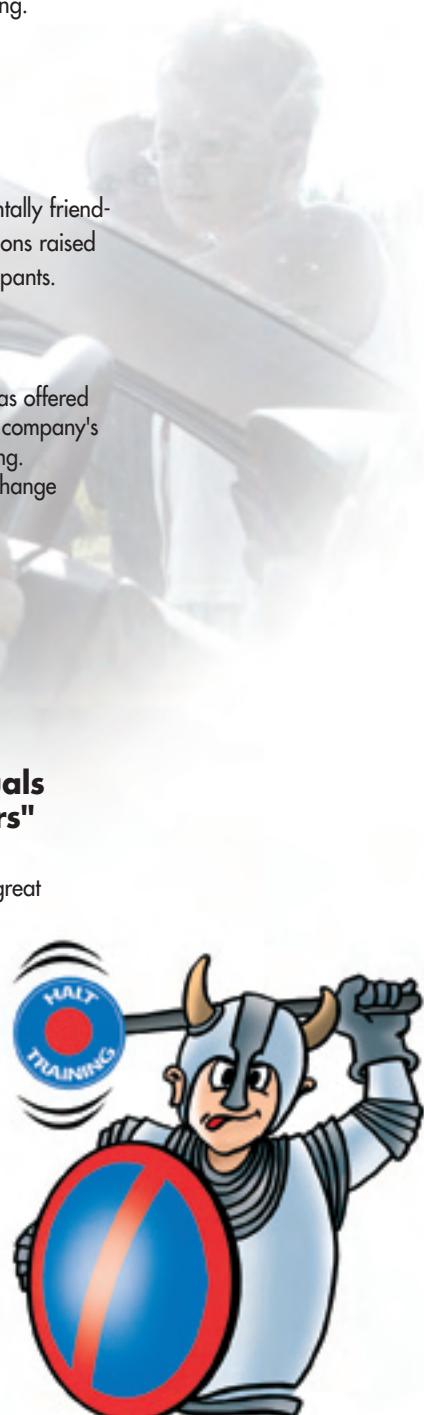
#### Positive premises of the SWU training:

- Voluntary participants are highly motivated.
- The participation during office hours is considered to be a welcome change.

### 1.1.4.3 The training experience of "easily offended individuals with a penchant for drama" and of "bright dreamers"

The SWU training is especially designed to encourage drivers with a high degree of assertiveness and a great willingness to engage in confrontation who participate in everyday commuter traffic to adopt a more relaxed attitude on the road. For them, however, stress functions as a kind of safety valve so that some individuals increase it of their own accord. Consequently, this group of test persons is not interested in reducing their stress level by changing their driving style. They come to the training with false expectations (regarding it as a kind of "action event") and thus leave with a sense of disappointment. As their habitual way of driving is criticised as "wrong", they perceive the training as a psychological mortification whose importance should not be underestimated. Hence these **"easily offended individuals with a penchant for drama"** pass through the training with a lot of defensiveness.

In the SWU training, the aspect of fuel economy, which is often quite unpopular among professional drivers, is given prominence. Very few drivers have a personal connection to the fuel consumption of their company car as payments are handled directly by the employer. Besides, since no visual aids are used in the training to help them comprehend the monetary savings involved (e.g. by means of consumption metres or refuelling), participants are lacking personal experience of what these savings mean and they are unaware of the fact that they can use the savings tips also in a private context. The connection between a more economical way of driving and more safety does not become apparent either.



"Individuals with a penchant for drama" disapprove of the changes intended by the training and of what they regard as a curtailing of their individual freedom. They consequently withdraw and repress what they have experienced once the training course is completed. If the SWU training is perceived in this way, its chances of success are minimal.



For "bright dreamers" for whom on-the-job driving tends to be a relief, the SWU training is mostly a positive experience. Since they essentially expect the instructor to validate their driving style, they approach the training with openness and a willingness for change. Once their initial fear of failure and their scepticism with respect to more recent tips such as "shifting up as soon as possible" and "switching off the engine whenever and wherever appropriate" have been overcome, "dreamers" experience the concrete and practical use of the training.

Drivers who approach the SWU training in such a positive way become personally aware of the benefits of driving in a more relaxed fashion, e.g. by seeing that driving in a laid-back way does not take them any longer than driving hurriedly. This boosts their self-image, and the more conscious driving style increases their attentiveness. The SWU training has the capacity to inspire the "dreamers" and have a lasting positive influence on them, unless the circumstances for participation were negative, as described in 1.1.4.2.

### 1.1.5 The psychological effects of the SWU training

In its present form, the SWU training is inseparable from the context of the respective business or company and the participant's individual occupation. The following factors influence the outcome of the training:

- the attitude that the business or company has towards the training
- the way the training has been announced within the company and the way in which the participants have been induced to join
- the relationship of staff members towards their business or company
- the date of the training

Since SWU courses deal with the issue of "safety", they develop a psychological dynamic and drama of their own which ultimately extend even into the psychological make-up of the participants. Especially for "individuals with a penchant for drama", the course, previously categorised as harmless, proves to be extremely explosive in terms of its psychological effects.

The SWU training affects participants on different levels. Due to influences arising from the respective company or the specific professional context, disturbances may occur at any of the following levels:

Level of impact	Disturbance
Openness for new developments	A lack of readiness to change minimises the chance of success of the course.
Professional value	False expectations and the disappointments associated with them can be avoided by effective communication within the company. Staff members who feel appreciated will not suspect the training to be an imposition on the part of the employer, or as a curtailing of their individual freedom. Voluntary participation increases the chance that the course will be successful.
Experience of on-the-job driving	If the contents of the training constitutes a threat in terms of how the driver experiences his/her on-the-job driving activities, it is not going to be successful.
Psychological make-up	If parts of the training are seen as insulting by the test persons (e.g. when "individuals with a penchant for drama" feel their self-image being insulted), this has a negative effect on the value of the course.

## **1.1.6      Insights and recommendation**

In order to improve the efficiency of the SWU training, the influence of the company and the professional context should be minimised.

### **1.1.6.1    The safety aspect and the title of the training**

The safety aspect dominates both the title and the public announcement of the SWU training. However, the focus of the training is on fuel economy and eco-driving. Thus, expectations in terms of experience-oriented action are raised which will be frustrated in the course of the training. The name of the course could be associated with driving school lessons and implies a paternalistic attitude towards the driver. Compulsory attendance of the SWU training adds to the impression that the person's daily work routine is determined by others. It is difficult to communicate that safety, fuel economy and eco-driving techniques are not incompatible with each other, and this can be harmful as far as the credibility of the training is concerned.

To motivate drivers to participate, the aspect of fuel economy should be emphasized more. However, since it has negative connotations, it should be subjected to a fundamental reassessment. Safety aspects, and due to their psychological explosiveness, environmental aspects too, should take a back seat. The main title should emphasize that fuel economy is both "clever and up-to-date". – It is professional for drivers to make use of eco-driving techniques and they can derive personal benefit from their driving behaviour as well. The subtitle could be used to stress the relationship between eco-driving and increased safety.

### **1.1.6.2    The atmosphere during the course**

Time and again, participants have praised the informal and relaxed atmosphere in the course. The course instructors seem to be successful in embodying competence and expertise while simultaneously acting as partners to the test subjects.

The experiential value of the training and the fun factor should be enhanced even more. The personal benefit should be accentuated more, too. To avoid the impression that the course serves the company management as a means to keep a check on the driver, it should have a leisurely feeling to it, but at the same time be held during working hours.

### **1.1.6.3    Discussion of the theoretical part and of tips**

In the theoretical part, the test persons mostly feel taken seriously and as "experts" on the subject. Elaborating the tips together gives them the feeling that they are being given some "breathing space".

Two of the seven tips (keep tyres properly inflated at the recommended pressure, and remove surplus weight) are not practised during the training. Besides, there is a general lack of acceptance for measures such as repeatedly installing a luggage track and removing it again if it is used only occasionally, but on a regular basis in one's daily job. The tip "drive at low engine revolutions and shift up as soon as possible" holds great fascination. The tip "drive in a relaxed way", on the

other hand, does not seem particularly catchy and does not fit into the general scheme of things. As far as their feasibility is concerned, these tips are often met with considerable scepticism. In the course of the practice drive, however, the participants experience how effective they actually are. All the participants who were questioned about the training tips were able to remember them fairly well.

→ By no means should the SWU tips be contradictory to the demands made on participants at work.

→ As regards the tip "switch off the engine whenever and wherever appropriate", it should be pointed out clearly that it is not necessarily appropriate to switch off the engine at every stop.





→ The tip "create scope for decision-making – preserve your 'competence to act'" is unclear due to the way the term 'competence' is used in this context. It is not meant to address the driving skills of the participants, which should not be called into question under any circumstances, but the freedom of action in certain traffic situations. The tip should therefore be rephrased as "Create scope for decision-making – preserve your own initiative".



→ In order to reach drivers who use a car with automatic transmission with the tip "drive at low engine revolutions and shift up as soon as possible" as well, the course should demonstrate how the new eco-driving technique can be applied to automatic cars.



→ The tip on the use of momentum should be simplified to read "use momentum and built-up energy".

#### 1.1.6.4 The didactic structure

The structure of the training is comprehensive and coherent. It is advisable to give the training course a stronger experiential orientation. In the practical part, no evidence is given for the improvement of the fuel economy performance, e.g. by means of refuelling, which would help participants to see the positive effects of eco-driving and have them experience the training as an eco-driving course to start with.

The form "check list and aspects to be observed", which participants are asked to fill in during individual driving instructions, is didactically problematic as it induces them to a kind of standstill agreement – the actual drive is not being assessed. This form should be done away with.

The SWU training should not be presented to participants as a job-related training but as a course for motorists in general. The suggestions made are of a general nature anyway rather than being job-related. To the businesses or companies in question the training should be presented as an eco-driving course with a high potential for cost-efficiency. They should receive instructions in advance on how to recruit participants and inform them about the training topics.

#### 1.1.6.5 Recommendations on alternative versions of the SWU training

##### 1.1.6.5.1 45 minutes of individual "on-the-job" driving instruction

The demand for this alternative version of the training in businesses or companies is very low, even though this mode leads to the least losses in productivity provided the training is conducted during working hours. Companies are required to step up their efforts to inform and convince potential participants about the usefulness of the course.

Rather than making participation compulsory, companies should motivate their staff to participate by trying to make them see how participation could help them save fuel and money in their private lives:

The SWU training could be positioned as a gift that the employer gives to his staff to lighten up their work day. However, this would require a stricter separation of the training from everyday working life.

### **1.1.6.5.2 Group driving instruction with a change of instructors every 45 minutes**

Due to the shorter intervals, the overall context does not get lost, nor does the attentiveness of the participants suffer. Every participant can perform the practice drives in his or her own vehicle and this facilitates the transfer of the tips to everyday driving. The group is seen as a protected environment by the participants in which the instructor has the function of a facilitator who corrects their driving behaviour.

It is precisely this alternation between instructor-directed and independent driving in rapid succession that seems to facilitate an effective learning process. This alternative training version could be utilized as a starting point for the development of a concept which has an even greater impact.

### **1.1.6.6 The role of the instructor**

Thanks to their function as facilitators, the instructors help defuse the teacher-student relationship and thus make an important contribution to the success of the SWU training. They teach the training topics to the participants and can assist them in overcoming their fears.

The instructors should be provided with information about the specific impact of the SWU training so that they are better equipped to counteract a possible "backing out" on the part of participants, and to refute frequently raised points of criticism.



### **1.1.6.7 The training materials**

The cartoon-like appearance of the training materials is liable to create friction. In future revisions, attention should be paid to the fact that the seriousness and the credibility of the material cannot be called into question. On the title page of the brochure, the image of the smiling woman should be replaced by an appropriate safety theme, and the visual image of the cost-efficiency theme should be revised. In any case, the brochure should be handed out at the beginning of the course.

The transparencies which display the contents of the course are generally well received. In the transparencies numbers 5, 7, 7a, 8 and 9, the level of abstraction should be reduced and visibility should be improved.

The value of the certificate needs to be increased by giving participants more appreciation and praise during the course so that they gain the feeling that they have done well.

The outmoded stickers should be substituted by other give-away articles which can be used independently of the training, and, if used regularly, will help participants remember the training tips.



Herr/Frau

an und praktischen Training im Programm  
sicher, wirtschaftlich und umweltfreundlich fahren - die sinnvolle  
Autofahrt



## 1.2 Corollary psychological research on the training programme "drive safely and save gas along the way – safe, economical and environmentally friendly driving" at the Hamburg Waterworks

Carl Vierboom and Ingo Härlen, business psychologists, July 2003, on behalf of the German Road Safety Council

### 1.2.1 Background and objective

The goal of this study was to conduct an impact analysis of the BG/DVR programme "drive safely and save gas along the way – safe, economical and environmentally friendly driving" by means of a pre-post study. Both quantitative and qualitative data were collected to find out whether the training programme has succeeded in achieving the following effects:

- Reduction of fuel consumption
- Increased awareness of safety issues and of safe behaviour in road traffic on the part of staff members
- Less stress during service drives
- Reduction of vehicle wear and tear
- A more relaxed attitude in daily traffic

### 1.2.2 Study design

During the period of the study, the drivers who participated were allotted one vehicle for the whole time. Data on fuel consumption, repairs, third party liability claims and own damage claims were saved by vehicles. A total of 91 drivers took part in the training programme. The vehicles used were passenger cars with standard equipment on the one hand, and passenger cars whose interior had been rearranged so that they had only two seats left on the other.

The trainings were carried out after a preliminary psychological interview with the drivers had been held. This was followed by a written survey, a telephone survey on the short-term effects of the trainings a few weeks after participation, and another interview on the long-term effects after 7 months. The quantitative data (fuel consumption, repair costs etc.) were evaluated and compared after 3, 5 and 11 months respectively.

The trainings were conducted as one-day or half-day courses with 6 or 3 participants per training and an almost identical course schedule:

1. Exchange of information and ideas (75 or 45 minutes)
2. Practical training in the form of group driving instruction (45 minutes per driver)
3. Exchange of experiences as a group (60 or 30 minutes)

### 1.2.3 Basic premises before the start of the training

15 individual interviews of approximately 1.5 to 2 hours' duration each, and 2 group discussions with 10 participants each were conducted to provide a basis for an adequate assessment of the general environment in which the planned programme was to take place. Amongst other things, staff members were queried about their working conditions, about typical examples of service drives and stressful situations as well as the relationship between management and staff.

# FAHR UND SPAR MIT SICHERHEIT

For decades, the Hamburg Waterworks (HWW) have been known as a company who offered crisis-proof jobs to their staff. However, the company has been undergoing a period of upheaval for some years now. Its intention is to provide their staff with the skills they need in a newly opened market.

Service drives undertaken by HWW staff are mostly running smoothly and in an "orderly" fashion. Misdemeanours and accidents are relatively rare incidents. Due to the colour of their vehicles and their corpo-

rate logo, the drivers are highly visible to Hamburg's population.

Before its initiation, the scheme "drive safely and save gas along the way" was suspected to be an instrument for potential rationalisation measures or a punitive measure for staff members who had attracted negative attention because of their driving behaviour. Such misguided communication about the projected training programme made its success appear fairly questionable. In the description of the impact of "driving a car as part of one's job"

(which the study has made possible), five ways of performing service drives could be identified and an assessment of the impact of the "drive safely and save gas along the way" scheme could be made.

## 1.2.4 Driving a car as part of one's job – five types of drivers

There are different ways of how drivers perform service drives and how they attribute a specific meaning to them. In the following description, five types of drivers are specified:



### 1.2.4.1 Autopilots

Drivers of this type regard themselves as representatives of their company and as well-oiled cogs in its machinery. They spend a great deal of their working time in their cars. The routes which they take are familiar and frequently used by them so that a lot of routine and automatic behaviour occurs. Accordingly, their driving style is mostly relaxed and confident. Most of these drivers are experienced motorists who have been pursuing their profession for a long time.

This type of driver tends to meet the SWU training with initial scepticism. Nevertheless, in retrospect drivers of this kind begin to reflect on habits that have become second nature to them.



#### **1.2.4.2 Agitated or rushed drivers**

The "agitated or rushed drivers" are the antithesis to the "autopilots". For them, car driving is a means to an end only and is completely subjected to the needs of the company. They experience themselves mostly as directed by others. A controlled planning of their journeys is rare. There is hardly any chance for the establishment of a fixed routine. Driving turns into an additional source of stress. At the wheel, "agitated or rushed drivers" are unbalanced and do not always act in conformity with road traffic regulations.

For these drivers especially, the "drive safely and save gas along the way" scheme can have a stabilising effect as it induces them to pay more attention to driving. Participants often describe that they experience a greater calmness due to a more proactive driving style which they adopt simply by concentrating more on the contents of the training.



#### **1.2.4.3 Privatizers**

The "privatizer type" is related to that of the "autopilot". To this type of driver, motoring is an activity which happens almost automatically and therefore gives him/her scope for daydreaming and an opportunity to relax.

In the beginning, privatizers tend to approach the training programme with considerable scepticism as they are concerned that its main purpose is to economise and that they will be limited in their freedom, too. However, active participation in the training leads to a "reframing" of this viewpoint: The drivers now have the feeling that they are gaining leeway and more autonomy.



#### **1.2.4.4 Even-tempered or balanced drivers**

"Even-tempered or balanced drivers" are mainly drivers with a lot of driving experience. They master the art of completing orders and the journeys they entail in such a way that they arrive at their destination quickly while remaining even-tempered and relatively stress-free. As far as HWW is concerned, this type of driver was fairly common among long-term staff members.

"Even-tempered or balanced drivers" regard the training as an interesting offer.

#### **1.2.4.5 Meticulous or fussy drivers**

"Meticulous or fussy drivers" present themselves to the outside world as rational and matter-of-fact individuals. They strictly adhere to rules and regulations such as speed limits and behind-the-wheel times – in other words, a clock puncher mentality. The overemphasized and exaggerated adherence to the rules is used as a means to counteract the perception that their lives are in fact determined by others. The "drive safely and save gas along the way" scheme provides "meticulous or fussy drivers" with welcome material for a "righteous" and "orderly" manner of driving. Meticulous or fussy drivers keep a detailed account of their fuel-economy performance.



## 1.2.5 Results

### 1.2.5.1 Written survey subsequent to the training

Subsequent to the SWU training, 84 out of 91 participants filled in a reply sheet where they evaluated the way in which the training was conducted. It is noticeable that despite the initial scepticism, the training programme was given a positive evaluation.

The statements on the practical value and everyday use of the training in particular met with a high degree of approval. In other words, the training promoted a pragmatic and open-minded attitude which enabled participants. To respond positively to the answer to the question "What's in it for me?"

The drivers have had positive experiences during the training and they are convinced of its efficacy and its potential for change. No less than 72 of the interviewees stated that they were able to get a good grasp on how to save fuel while driving. For the vast majority of the participants, the training programme had one or several benefits. Among these, the possibility for private savings was given the most prominence (73 entries).

For 62 participants, making a contribution to environmental protection is an important aspect. However, this statement could be partly due to a recent trend – which can be observed in Germany in particular – to give a politically correct response when issues of environmental protection are being presented. A relatively high degree of acceptance can also be found for statements that deal with safety issues, such as "a more relaxed way of driving", "avoid stress" and "increase safety". Evidently the training makes an impact in this area, if nothing else.

Most participants describe their own manner of driving as "normal" (59 entries). Apart from that, terms that describe a safety-conscious driving style are given preference: "cautious" (11 entries), "relaxed" (22), "attentive" (35), "safe" (27) and "conscientious" (15). On top of that, there are descriptions which have to do with a casual or a resolute driving style: ("fast"/10 entries, "sportive"/10, "relaxed"/22, "casual"/18). This suggests that the responses given are characterised by a high degree of credibility.

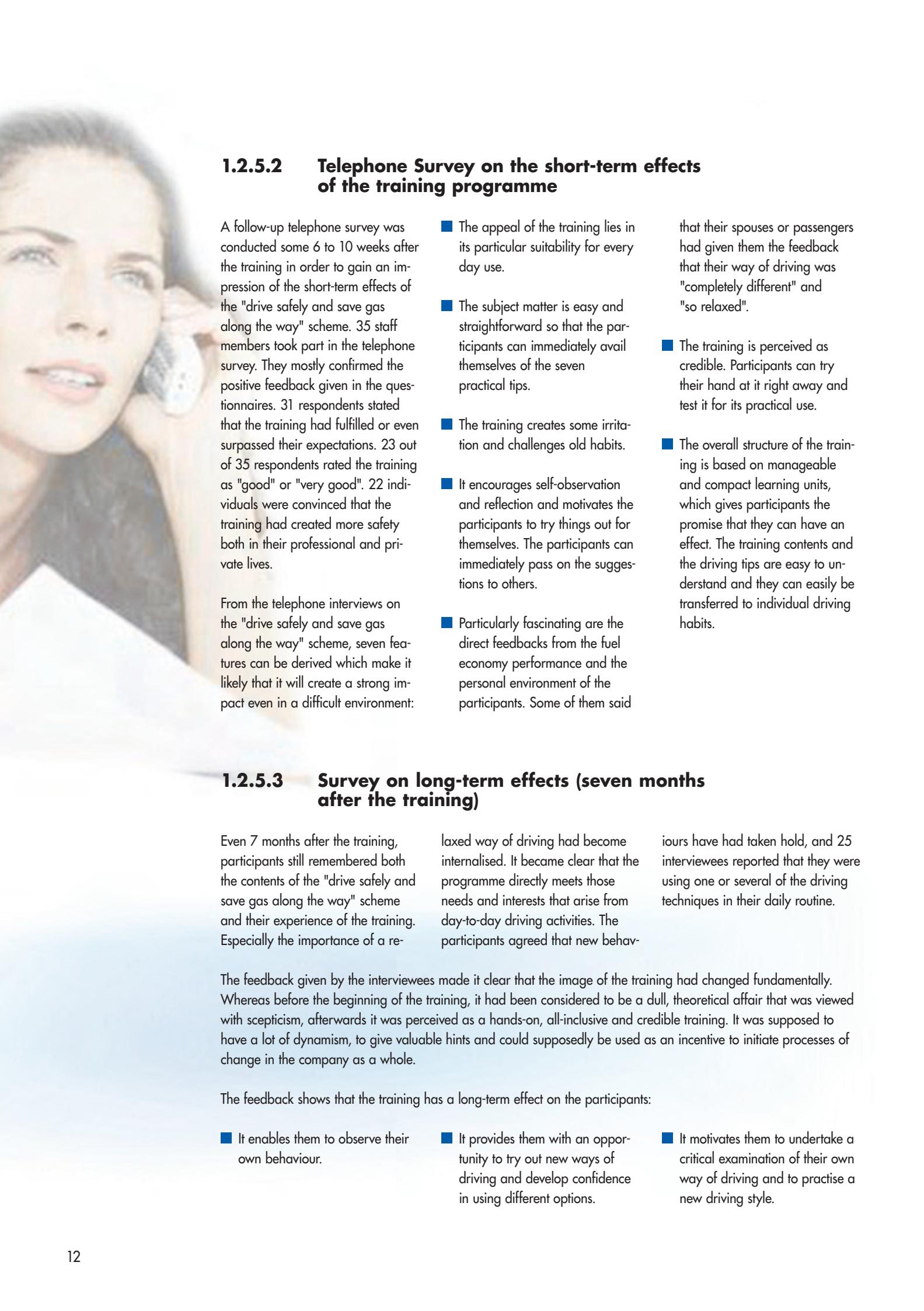
The training participants criticise the fact that they were not informed about the programme in due time. Many of them view the in-house prerequisites for the training negatively. 54 participants point out that additional measures, such as providing modern vehicle equipment and means of communication, would be necessary to achieve cost-effectiveness.

79 out of the 84 participants think that it would be a good idea to repeat the training from time to time. In view of the expectations, complaints and prejudices which were voiced previously to the training programme, the positive response following it speaks for its success. It can be assumed that the actual training experience has brought about a positive change in attitude. What is also conceivable is that the interviewees have perceived the training as a pleasant timeout from their daily work routine and from the problems they encounter in their company. Another factor that may have influenced their vote is their experience of the training programme as a pleasantly straightforward and uncomplicated scheme,



which in a hands-on manner provides clear information, feedback and thus support and orientation. Of course, it is also to be assumed that socially desired responses have been given to this question.

The whole array of questions concerning desires and demands in connection with the training modules results in a typical scenario in which the way responses are given can be regarded as essentially truthful. As far as preferred programmes go, the "skid control course" ranks first (57 entries).



### 1.2.5.2 Telephone Survey on the short-term effects of the training programme

A follow-up telephone survey was conducted some 6 to 10 weeks after the training in order to gain an impression of the short-term effects of the "drive safely and save gas along the way" scheme. 35 staff members took part in the telephone survey. They mostly confirmed the positive feedback given in the questionnaires. 31 respondents stated that the training had fulfilled or even surpassed their expectations. 23 out of 35 respondents rated the training as "good" or "very good". 22 individuals were convinced that the training had created more safety both in their professional and private lives.

From the telephone interviews on the "drive safely and save gas along the way" scheme, seven features can be derived which make it likely that it will create a strong impact even in a difficult environment:

- The appeal of the training lies in its particular suitability for everyday use.
- The subject matter is easy and straightforward so that the participants can immediately avail themselves of the seven practical tips.
- The training creates some irritation and challenges old habits.
- It encourages self-observation and reflection and motivates the participants to try things out for themselves. The participants can immediately pass on the suggestions to others.
- Particularly fascinating are the direct feedbacks from the fuel economy performance and the personal environment of the participants. Some of them said that their spouses or passengers had given them the feedback that their way of driving was "completely different" and "so relaxed".
- The training is perceived as credible. Participants can try their hand at it right away and test it for its practical use.
- The overall structure of the training is based on manageable and compact learning units, which gives participants the promise that they can have an effect. The training contents and the driving tips are easy to understand and they can easily be transferred to individual driving habits.

### 1.2.5.3 Survey on long-term effects (seven months after the training)

Even 7 months after the training, participants still remembered both the contents of the "drive safely and save gas along the way" scheme and their experience of the training. Especially the importance of a re-

laxed way of driving had become internalised. It became clear that the programme directly meets those needs and interests that arise from day-to-day driving activities. The participants agreed that new behav-

iours have had taken hold, and 25 interviewees reported that they were using one or several of the driving techniques in their daily routine.

The feedback given by the interviewees made it clear that the image of the training had changed fundamentally. Whereas before the beginning of the training, it had been considered to be a dull, theoretical affair that was viewed with scepticism, afterwards it was perceived as a hands-on, all-inclusive and credible training. It was supposed to have a lot of dynamism, to give valuable hints and could supposedly be used as an incentive to initiate processes of change in the company as a whole.

The feedback shows that the training has a long-term effect on the participants:

- It enables them to observe their own behaviour.
- It provides them with an opportunity to try out new ways of driving and develop confidence in using different options.
- It motivates them to undertake a critical examination of their own way of driving and to practise a new driving style.

#### **1.2.5.4 Quantitative data analysis\***

An analysis of the data collected from the Hamburg Waterworks vehicle fleet was carried out to ascertain whether the SWU training served to reduce fuel consumption. Fuel costs were compared after three, five and eleven months respectively.

Three months after the training, the participants had improved their fuel economy performance by 6.41 per cent. An extrapolation of this improvement to the entire HWW vehicle fleet would mean savings to the extent of approximately 10,000 litres of fuel per year. An analysis of the data after five months showed that the fuel economy performance had decreased which could imply that the training had only achieved a short-term impact after all, or that the data records contained random disturbance (atmospheric conditions etc.) which led to analytical ambiguities. More information was to be

gathered from a long-term review over a period of eleven months.

A comparison of the consumption data for the time periods October 2001 to August 2002 (before the training) and October 2002 to August 2003 showed that fuel consumption had decreased by 6.17 per cent. This supports the claim that the BG/DVR training programme "drive safely and save gas along the way" results in permanent changes in an individual's driving behaviour. This relieves the drivers who find themselves driving in a more relaxed way, and it also leads

to considerable financial savings. In the time period described, third party liability claims at the HWW dropped by 21.79 per cent, whereas own damage claims declined by 34.78 per cent.

In addition to the verified savings in fuel and insurance costs, cost reductions can be expected with respect to wear and tear and maintenance costs.

\* supplemented by figures from the article "Increased safety and economic benefit could be verified" by Jochen Lau, Kay Schulte and Carl Vierboom, BG 03/05 p. 121 ff.

#### **1.2.6 Summary**

The "drive safely and save gas along the way" scheme has quantifiable benefits for the companies involved, which is why it should be implemented in companies along with the safety goals it promotes. It offers concrete rules of thumb and strategic hints which permit its immediate use, testing and implementation in everyday driving. Several reasons speak for the fact that this training programme carries great potential in the marketplace:

- 1.** The training brings financial profits to the companies who bring it to bear.
- 2.** The training offers incentives for a positive attitude change among staff members and for a congenial working atmosphere in the company (motivational benefit). Prerequisites for this to happen are the appropriate embedding and communication of the training programme within the company.
- 3.** The "drive safely and save gas along the way" scheme has qualities which from a marketing point of view could be regarded as "unique selling propositions (USPs)": a direct chance to apply the newly-gained knowledge, easy verifiability, great allure and entertainment value, suitability for everyday use.
- 4.** Due to its user-friendliness and its compatibility with daily driving activities (whether service drives or others), the SWU training is a gratifying offer when compared to what is traditionally offered in the training arena. – It does not require anything from the company or from staff which they cannot manage. Costs and expenses keep to a minimum, it has various benefits and can contribute to improving the general mood and morale within the company.



## **1.3 Corollary psychological research on the training programme "drive safely and save gas along the way – safe, economical and environmentally friendly driving" at the swb Netze GmbH & Co. KG**

**Carl Vierboom and Ingo Härlen, business psychologists,  
interim report, February 2005,  
on behalf of the German Road Safety Council**



### **1.3.1 General conditions**

The goals and the study design of the corollary research on the SWU training at the swb Netze GmbH & Co. KG correspond to the general conditions mentioned in connection with the corollary research on the training conducted at the Hamburg Waterworks (see 1.2). Particular attention should be given to the private use of the training for participants as well as to the development of a relaxed driving style.

### **1.3.2 Results**

As was the case with the other training, here too, the present situation and the development of the company have a great impact on the progression and the acceptance of the training programme.

After the feedback subsequent to the training made it clear that the programme had partially been received with scepticism and rejection, and that positive feedback was only given more or less covertly, a telephone survey conducted a few weeks later yielded a much more positive outcome.

25 out of 35 interviewees stated that the training programme had fulfilled or even surpassed their expectations. In 82.9 per cent of the responses, the training programme was rated as "good" or "very good", 6 individuals rated it as "satisfactory". 27 interviewees (77.1 per cent) held that participation in a training of that nature could increase their safety both professionally and privately.

The initial scepticism was gradually overcome thanks to the positive effects of the training. In this context, particular emphasis was given to the simplicity and the comprehensibility of the training topics.

## **2. Eco-trainings in the context of other events**

### **2.1 Corollary research on the fuel-saving driving lesson at the 2003 AMI**

**Kay Schulte and Claire Wree, German Road Safety Council,  
May 2003**

#### **2.1.1. Background and objective**

The present study was conducted to analyse the fuel-saving driving lesson offered at the AMI 2003 from the point of view of the participants. The main point in this context was to examine how they assessed the car manufacturers' offer, the instructor, the driving tips as well as potential future offers, and to use the outcome of this analysis to give recommendations for the optimization of the programme.



#### **2.1.2 The training model under examination**

The fuel-saving driving lesson is a 60-minute training offered by the German Road Safety Council, the Institutions for Statutory Accident Insurance and Prevention for Trade and Industry and the German Federation of Driving Instructors' Association. It serves to teach motorists in a realistic way how they can improve their individual fuel economy performance without having to dispense with their driving pleasure. Within the scope of the AMI, the German Road Safety Council and the Association of International Motor Vehicle Manufacturers offered a shortened version of the fuel-saving driving lesson. The goal of the AMI fuel-saving driving lesson (which lasts between 20 and 30 minutes) is to give motorists an awareness of fuel economy and environmental issues by offering them the possibility to conduct test drives in the latest car models displayed by various exhibitors. While the participants are taking a ride through Leipzig's road traffic, professional instructors give them valuable hints.

**The central topics of the fuel-saving driving lesson are:**

- Use momentum and built-up energy
- Drive at low engine revolutions and shift up as soon as possible
- Create scope for decision-making – preserve your own initiative

The following car manufacturers participated in the AMI fuel-saving driving lesson in 2003: Honda, Hyundai, Peugeot, Renault, Seat and Subaru.

#### **2.1.3 Study design**

Some four weeks after the conclusion of the AMI, participants of the fuel-saving driving lesson were sent questionnaires with the request to give feedback on the training. 191 participants (i.e. 40.47 per cent) sent back their feedback forms. On average, the respondents were between 26 and 36 years of age. 171 respondents were male and 20 were female.

## 2.1.4 Results

- A fuel-saving, eco-friendly driving style meets with a high degree of acceptance in the general public. The majority of the interviewees assumed that modern vehicles per se have better mileage.
- Such offers were welcomed by potential customers (88 per cent approval).
- The participants perceived the individual training as a kind of epiphany as it became clear to them that the fuel economy tips could indeed be implemented. Many participants would not have expected that you could drive a vehicle in this way (36 per cent), or that you could drive at low revolutions in this way (39 per cent). 68 per cent of the respondents explained that while following the tips, they were still able to follow the normal traffic flow. More than half of them perceived the implementation of the tips as pleasant, and for 67 per cent it was important to try out these techniques on their own vehicle later on.
- The instructor plays a central role. Participants showed great appreciation when the instructor exuded competence and gave them helpful hints (84 per cent or 81 per cent approval).
- The AMI fuel-saving driving lesson takes on the role of a "covert test drive". For 77 per cent of the interviewees it was important to familiarise themselves with a new vehicle. 60 per cent of them would have liked to drive it for a longer period of time.
- 72 per cent considered it appropriate to combine that type of offer with the purchase of a new car.



- The majority of the respondents (80 per cent) expressed surprise that car manufacturers were making a practical offer in terms of eco-driving.

## 2.1.5 Recommendations

The analysis shows that the "fuel-saving driving lesson" is an up-to-date and a well-received offer. It takes interested drivers on a "journey of discovery" with a competent "guide" (the instructor) to introduce them to a new way of driving. It piques people's curiosity and motivates them to try out the tips for themselves.

For car manufacturers, the AMI fuel-saving driving lesson takes on the role of a marketing tool ("covert test drive"). It invites buyers of a new car to look into a particular product. It seems sensible to reflect on ways of how this "competently guided journey of discovery" can be applied as a marketing tool in the future.

# SPRITSPARSTUNDE

## 2.2 Direct interviews on "Eco-Driving – managed by DVR" (in cooperation with the Ford-Werke GmbH) and corollary research on the fuel-saving driving lesson at the 2004 AMI trade fair

Kay Schulte and Claire Wree, German Road Safety Council,  
June 2004

### 2.2.1. Background and objective

Direct interviews conducted in connection with the Eco-Driving training drives at the AMI and the corollary research on the fuel-saving driving lesson were meant to show how the activities offered at the AMI 2004 were assessed by the participants.

### 2.2.2 The training model under examination

In the framework of the AMI 2004, Ford offered a brief version of the Eco-Driving training (20 minutes) using only the car models Focus, Mondeo and C-MAX. As in 2003, the AMI fuel-saving driving lesson was held simultaneously with the Eco-Driving training (see 2.1.2). A total of 12 car manufacturers participated in the AMI fuel-saving driving lesson 2004: Ford, Honda, Hyundai, Mazda, Opel, Peugeot, Seat, Skoda, Subaru, Suzuki, Toyota and Volvo.

### 2.2.3 Study design

The participants of the Ford Eco-Driving trainings were questioned immediately after the conclusion of the training drives or test drives. As before, the participants of the fuel-saving driving lesson were contacted in writing some four weeks after the conclusion of the AMI and were asked to give feedback on the training by filling in a questionnaire. 488 participants returned the questionnaires (rate of return within four weeks: 49.64 per cent). 432 of the respondents were male and 56 were female.

### 2.2.4 Results

HONDA  
The Power of Dreams



HYUNDAI



mazda



OPEL



PEUGEOT



VOLVO

#### 2.2.4.1 Results on Eco-Driving

The vast majority of participants gave very good marks to the Eco-Driving training. The test drive received an overall mark of 1.57 (1 = very good ... 5 = insufficient). The Ford test vehicles received a mark of 1.65, the instructors even got a 1.24.

More than 84 per cent of the participants hold that they can use the trainings tips in their everyday lives

(2 per cent "no", 14 per cent "don't know"). 58.4 per cent of the participants were planning to conduct another test drive at their car dealer's. Among the test drivers of the new Ford Focus C-MAX, even 80 per cent were planning to do so.

The average fuel consumption during the Eco-Driving activities amounted to 6.96 litres per 100 kilometres. That means that the average

consumption was 23.05 per cent less than the fuel consumption under standard conditions as indicated by the manufacturer. For the models Focus and C-MAX, there was even a minus of 26.09 and 35.32 per cent respectively so that the deviation in these two cases was particularly high.



Neugierig? Heute ausprobieren bei



VOLVO



## SPRITSPARSTUNDE

### Possible explanations are:

→ The fuel consumption under standard conditions has been overstated.

→ The new driving techniques are particularly appropriate for these car models.

→ The majority of people who tested these cars were individuals who drive frequently as part of their job, and these drivers were particularly successful in implementing the training tips.

### 2.2.4.2 Results of the AMI fuel-saving driving lesson

- As in the previous year, the majority of respondents (63.85 per cent) were surprised that car manufacturers were offering hands-on programmes on fuel economy. However, the surprise factor has been abating. In the year before, as many as 80 per cent of the respondents had stated that they were surprised.
- The training drive offer was welcomed by potential clients and given a positive evaluation (more than 91 per cent rated the training as "good" or "very good").
- The instructor continued to have a central role. The participants attested to the competence of the instructors at the AMI 2004 (86.30 per cent approval) as well as to their ability to give helpful advice (84.78 per cent). Only one in ten participants had the feeling "that they were in driving school". In most cases, the instructors succeeded in adopting the role of a coach.
- Once again, as it happened at the AMI 2003, the fuel-saving driving lesson assumed turned into a "covert test drive". 80.43 per cent of the respondents enjoyed becoming acquainted with a new vehicle. The proportion of those for whom the AMI fuel-saving driving lesson

was too short was at a similar level as in the previous year. 64.57 per cent would have liked to drive their vehicles for a longer time. 57.83 per cent found the training too short and would have liked to receive more information.

■ The test drive has an additional and sustainable value for the participants. This is proven by their confirmation of the following statements:

→ The tips given by the instructors were helpful (84.78 per cent)

→ The instructor gave good hints on the implementation of the various techniques (72.61 per cent)

→ While following the tips, I was able to follow the normal traffic flow (71.30 per cent)

→ The experiences I had during the training have encouraged me to try out the tips in my own vehicle as well (67.83 per cent)

→ I have perceived the application of the tips as pleasant (59.78 per cent)

→ I found the training too short; I would have liked to receive more information (57.83 per cent)

It seems that the participants have acquired a real taste for the training.

■ The fact that 46.42 per cent of the respondents "did not believe that the tips could be implemented while they were driving" speaks for a certain amount of initial scepticism. However, in practice, this belief was refuted because the participants perceived the application of the tips as pleasant (59.78 per cent), and they experienced that they were able to follow the normal traffic flow (71.3 per cent).

■ 81.89 per cent would be in favour of including a similar offer in the process of purchasing a new car.

### 2.2.5 Recommendations

Many of the respondents found the training too short and they would have liked to receive more information. This suggests that the normal one-hour fuel-saving driving lesson is more likely to meet the needs of professional or frequent drivers.

## **2.3 Corollary research on the fuel-saving driving lesson at the 2005 AMI trade fair**

**Kay Schulte and Claire Wree, German Road Safety Council,  
May 2005**

### **2.3.1. Background and objective**

The corollary research on the AMI fuel-saving driving lesson was designed to ascertain how the participants evaluated the programmes offered in connection with the AMI 2005.

### **2.3.2 The training model under examination**

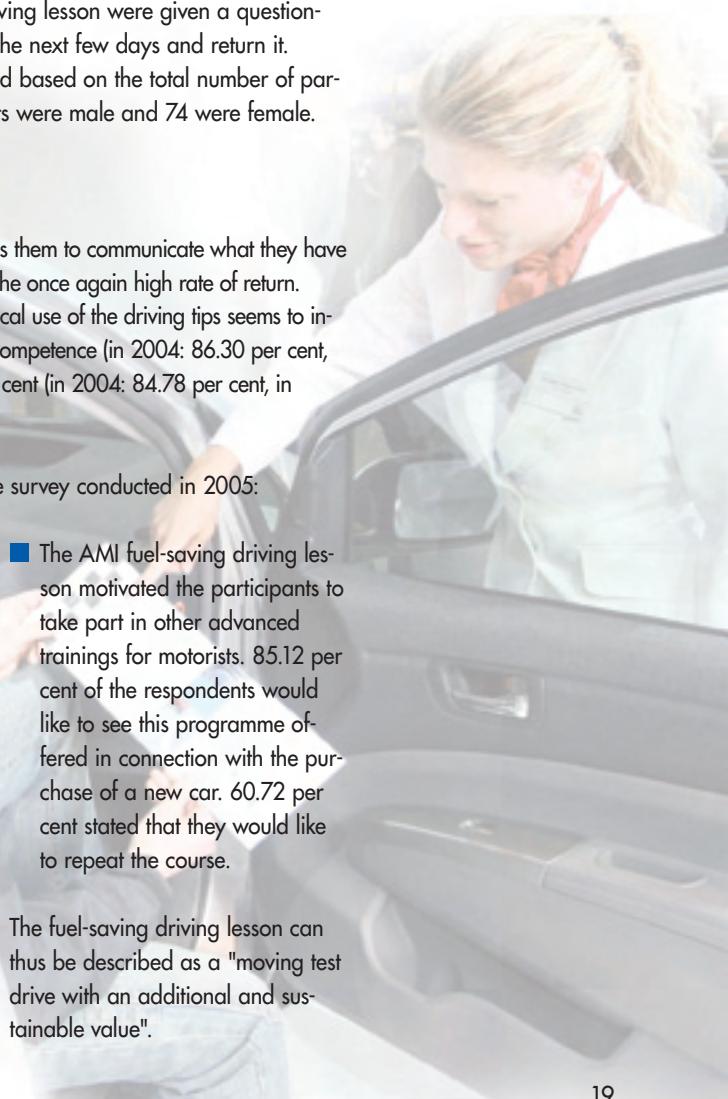
The AMI fuel-saving driving lesson was conducted along the same lines as in previous years (see 2.1.2). The same car manufacturers participated as in the year 2004 (see 2.2.2).

### **2.3.3 Study design**



Immediately after the training drives, the participants of the AMI fuel-saving driving lesson were given a questionnaire and a stamped addressed envelope with the request to fill in the form in the next few days and return it. 504 participants sent back their responses (rate of return within a 6-week period based on the total number of participants: 36.08 per cent, previous year: 33.26 per cent). 430 of the respondents were male and 74 were female.

### **2.3.4 Results**



The experience of the fuel-saving driving lesson moves the participants and motivates them to communicate what they have experienced even without the promise of a special benefit. This is also illustrated by the once again high rate of return. In the perception of the participants, the competence of the instructors and the practical use of the driving tips seems to increase from year to year. 92.46 per cent of the participants attested the instructors competence (in 2004: 86.30 per cent, in 2003: 84 per cent). The ability of giving helpful advice was praised by 89.68 per cent (in 2004: 84.78 per cent, in 2003: 81 per cent).

A number of results from the years 2003 and 2004 have been confirmed by the survey conducted in 2005:

- The vast majority of the participants rated the AMI fuel-saving driving lesson as altogether good to very good (95.84 per cent).
- The fuel-saving driving lesson turned into "covert test drive".
- This year too, the initial scepticism of the participants (61.31 per cent of the respondents expressed doubts that the tips could be applied while driving a car) was refuted in practice.
- The test drive had an additional and sustainable value for the participants. Most of the respondents were able to follow the normal traffic flow while following the tips (68.06 per cent). They perceived the implementation of the tips as pleasant (61.71 per cent), and they felt encouraged to apply them in their everyday lives (68.45 per cent).
- The AMI fuel-saving driving lesson motivated the participants to take part in other advanced trainings for motorists. 85.12 per cent of the respondents would like to see this programme offered in connection with the purchase of a new car. 60.72 per cent stated that they would like to repeat the course.

The fuel-saving driving lesson can thus be described as a "moving test drive with an additional and sustainable value".

## 2.4 Corollary research on the fuel-saving driving lesson offered at the AMI 2008

**Kay Schulte and Kornelia Fabian, German Road Safety Council,  
August 2008**

The evaluations undertaken in 2006 and 2007 confirmed the results obtained for the years 2003 to 2005 which is why they will not be addressed here. In 2008, a total of 23 companies took part in the AMI fuel-saving driving lesson so that the evaluation could be based on a comprehensive set of data:

### 2.4.1 Background and objective

Corollary research on the 2008 AMI fuel-saving driving lesson was conducted in order to find out how participants assessed the programmes offered at the AMI 2008. The findings were used as a basis for the advancement of these programmes.

### 2.4.2 Training model under examination

As in previous years, the AMI fuel-saving driving lesson was offered as a shortened version of the normal fuel-saving driving lesson. The goal of the 20-30 minute ride through Leipzig's road traffic was to give motorists an awareness of fuel economy and environmental issues by offering them the possibility to conduct test drives in the latest car models displayed by various exhibitors. Professional instructors accompanied the test drive and gave valuable hints to the participants. The following car manufacturers participated in the programme: Audi, Berner, Chevrolet, Citroen, Daihatsu, Fiat, Ford, Honda, Hyundai, Jeep, KIA, Lancia, Mazda, Nissan, Opel, Peugeot, Renault, Skoda, Subaru, Suzuki, Toyota, Volvo and Volkswagen.

### 2.4.3 Study design

As in previous years, the participants of the AMI fuel-saving driving lesson were given a questionnaire and a stamped addressed envelope after the conclusion of their training drives with the request to fill it in

within the next few days and send it back. As identical criteria for questioning have been applied since 2003, the results obtained over the years are easily comparable with each other.

In 2008, fears that the envelopes and questionnaires might get lost in the flood of materials collected at the fair and that this might have a negative effect on the return rate

could once again be allayed. The return rate of 28.76 per cent – which is a high rate for this kind of survey – showed that participants were eager to communicate their experiences and adventures.

793 participants sent back their responses until July 31. 639 respondents were male and 136 were female, 18 gave no particulars. Additional feedback forms arrived even after the period of examination had expired.

## 2.4.4 Results

In the last few years, the fuel-saving driving lesson has become firmly established at the "Auto Mobil International Fair" in Leipzig. Just like in previous years it became evident that the fuel-saving driving lesson serves the dual purpose of a "covert test drive" and a programme for becoming acquainted with fuel-saving driving techniques.

The vast majority of the participants in the AMI 2008 fuel-saving driving lesson enjoyed it: More than 95.68 per cent of the respondents rated it as "good" or "very good". The high degree of acceptance was not least due to the professionalism of the instructors (all of them professional driving instructors who had received

additional training specifically for this purpose). The vast majority of the participants agreed to the statements "the tips given by the instructor were helpful" (92.18 per cent) and "the instructor was competent" (91.80 per cent). The statement "the instructor gave me good hints on the implementation of the various techniques"

was ticked by 83.98 per cent. The driving instructors pursued an approach which was to the point, intuitive where necessary and sensitive to the respective situation. They were perceived as coaches rather than "teachers". Only 9.21 per cent of the respondents agreed to the item "I felt as if I were in driving school".

The fuel-saving driving lesson is an experience which has an additional and sustainable value for the participants. They learn that the tips are suitable for everyday use. More than 71 per cent of the respondents perceived the application of the tips as pleasant. More than 73 per cent emphasized that they were able to follow the normal traffic flow. Initial scepticism in terms of the applicability of the tips was overcome by the positive experience the participants had during the training. The test drive encouraged 74.4 per cent of the participants to try out the tips with their own vehicles as well.

The AMI fuel-saving driving lesson is a moving experience for the participants. It motivates them to share with others what they have learnt (high feedback rate) and sparks the interest to participate in other further training programmes for motorists. 68.35 per cent of the respondents stated that they would

like to take part in the same or a similar programme once again. At 59.52 per cent, the rate of agreement with the statement "I found the training too short; I would have liked to receive more information" was fairly high. This shows that quite a few motorists have the desire to practice the fuel-saving driving tips

more intensely. According to the results of the research done by BG and DVR, the one-hour fuel-saving driving lesson for individual drivers, which can be taken up anywhere and at all times, seems to be able to fulfil this desire.

It is noticeable that since 2003, agreement with the statement "I was already familiar with the tips presented to me" has been decreasing steadily: from 29 per cent in 2003 and 23.48 per cent in 2004 to 16.27 per cent in 2005, to 15.59 and 15.98 per cent in 2006 and 2007 respectively, to only 13.37 per cent in the year 2008. However, whereas due to the current economic crisis the issue of a "fuel-saving driving style" seems to have taken hold in society, the same cannot be said for the concrete tips and tricks conveyed by the instructors in the course of the fuel-saving driving lesson, at least not as far as the participants in the AMI programme are concerned.

The fuel-saving driving lesson has been showing positive effects as a "moving test drive with an additional and sustainable value" for several years now and it is going from strength to strength. It seems

promising to integrate this tool into already existing marketing concepts. Amongst other things, we have to deliberate about the fact whether this type of test drive should not be turned into an absolute must in the

corollary programmes. 87.6 per cent of the respondents would approve of combining such a programme with the purchase of a new car.

However, all the insights cited here are based on the DVR/VDIK concept for implementation during the AMI according to specific principles. If the well-proven principles are modified in any way, it can no longer be guaranteed that a comparable effect will ensue. This is something that should be observed and examined if necessary.

### **3. Eco-Driving**

#### **3.1 Qualitative, depth psychology-oriented impact analysis of the Eco-Driving training for private customers (in cooperation with the Ford-Werke GmbH)**

**Guido Lessenich, psychological impact research, August 1998, on behalf of the Ford-Werke GmbH and the German Road Safety Council**

##### **3.1.1 Background and objective**

The Ford-Werke GmbH, the German Road Safety Council and the German Federation of Driving Instructors' Association have developed a training programme to impart an economical, environmentally friendly and confident driving style. It is entitled: "Eco-Driving – managed by DVR". During the pilot phase from April to November 1998, trainings were conducted among selected Ford dealers.

The study at hand was designed to examine how the participants experienced this training which was specifically tailored to the needs of the Ford company. Its purpose was to assess its impact and the way in which it affects the car manufacturer's image. The results were to be used as the basis for optimizing the training.

##### **3.1.2 The training model under examination**

"Eco-Driving" aims at improving a car's fuel economy and at strengthening the confidence of the participants in road traffic. The training was supposed to have a high experiential value, be cost-efficient, ease the burden on the environment and increase road safety.

**In the pilot phase, the training was executed as follows:**

- 20 min. address of welcome, introduction to the handling of the Eco-Log consumption metre
- 40 min. 1st test drive
- 60 min. theoretical part
- 30 min. test on a moving ramp
- 30 min. drive which is commented upon by an expert
- 40 min. 2nd test drive
- 20 min. Discussion forum

##### **3.1.3 Study design**

Approximately two-hour non-standardized interviews with a depth psychology orientation were conducted with 31 participants who drive frequently as part of their job. All the test subjects had undergone a training. The survey has structured and summed up major psychological motives with relation to the Eco-Driving training according to their importance and recurring basic patterns.

##### **3.1.4 Results**

###### **3.1.4.1 Access to the training**

In the course of the training, the participants look into their own driving style. This presupposes a willingness for change. At any rate, voluntary participation makes it more likely for the training to be a success than compulsory participation.

### **3.1.4.2      Experience of the training**

Due to its experiential orientation, the Ford Eco-Driving training is highly effective. Its didactic, its structure and the role of the instructor make the training appear coherent. The casual atmosphere in which the training topics were worked out together was perceived as particularly pleasant. After the training many participants told others almost euphorically about their experience.

The instructors were praised throughout. They were said to teach the training topics in a clear, sympathetic and practice-oriented way. What was also seen as positive was the fact that they took the participants' latent fears and doubts seriously and made sure they would be relieved.

Whereas many participants were sceptical in the initial theoretical part, their tension lessened in the course of the practical instruction. In particular the corroboration of the improved fuel economy performance by means of the Eco-Log system led to an epiphany.



### **3.1.4.3      The effects of Eco-Driving**

The Eco-Driving training has an impact on the drivers who participate in it and it induces changes.

The drivers

- learn to become aware of their driving style and to improve upon it,
- experience an extended scope of action,
- acquire a self-image of being confident and safe drivers,
- derive personal financial profit from the training.

The Eco-Driving training has some features of a "driving test or a final examination for advanced learners". For drivers who are less ready to change there is the risk that they will be shutting down during the training. Drivers who are willing to change their driving style are rewarded with a sensual experience of their own skills. In everyday life, they sometimes develop an urge to optimise their fuel economy performance.

Particularly those participants who are prone to stress experience that thanks to their implementation of the Eco-Driving tips, they drive in a more relaxed manner. However, the training has the greatest impact on those individuals who are grateful for additional supervision.

Driving pleasure accrues from gains in confidence and personal freedom: Eco-Driving is not compulsory, but can always be practised on a voluntary basis. As the issue of environmental awareness is addressed with caution, a potential car/environment conflict can be avoided.

The Eco-Driving tips do not have a special news value. They are well-known tips, most of which can be found on the internet. Nevertheless, some of them stand in sharp contrast to the ingrained habits of the participants (e.g. shift up early, decelerate smoothly). After the training, shifting up early and driving at low revolutions are practised the most. On the other hand, the tips "use momentum = brake gradually" und "switch off the engine whenever and wherever appropriate", are almost completely disregarded and only practised sporadically.



### **3.1.4.4 Impact of the training on the image of the Ford company**

The credibility of the German Road Safety Council (DVR) and of the Eco-Log technology is transferred to the car brand as well. As the car manufacturer is mentioned in the title of the training, his company will be brought to the attention of the participants as well as that their family and circle of friends. This is contradictory to the otherwise gridlocked Ford image. The training has the features of a test drive.

### **3.1.5 Recommendations**

- The "Eco-Driving" training should be continued for private customers beyond the pilot phase. Furthermore, it is recommended that the training be tailored (in a slightly modified form, if necessary) to other target groups: novice drivers, drivers of old cars etc.
- Open up participation in the Eco-Driving training, eliminate difficulties to gain access to the training
- Combine the Eco-Driving training with other programmes
- Represent the training as a valuable gift
- Emphasize the exclusiveness of participation
- Perform separate trainings to convince multipliers (dealers, sales managers etc.)
- Provide basic information for dealers
- Elaborate documentation – divided by training types

### **3.1.6 Attempts at optimization**

#### **3.1.6.1 Name and appearance of the programme**

The subtitle has a patronising touch to it and runs contrary to the individuality of the participants ("uniform driving style"). It should be replaced by another subtitle that addresses aspects such as a conscious experience of driving, an extended scope of action, individualism and making the most of chances that arise. The appearance of the Eco-Driving materials should be revised so that they appear more up-to-date.

#### **3.1.6.2 Conceptual design**

The tips should be formulated in such a way that they also include drivers of cars with an automatic transmission. "Switch off the engine at traffic lights" should be replaced by "switch off the engine at closed railway crossings".

#### **3.1.6.3 Communication**

The role of the instructor as a tutor and partner to the participants should be cultivated. The instructors should take the pressure of being tested away from the participants ("every participant is a good driver"). It is advisable to point out that even the instructors cannot or do not always adhere to the Eco-Driving tips and that Eco-Driving is always a free choice.



## **3.2 Impact psychology-oriented brief analysis of the long-term effects of "Eco-Driving – managed by DVR" for private customers**

**Guido Lesserich, psychological impact study, August 1998,  
on behalf of the Ford-Werke AG and the German Road Safety Council**

### **3.2.1 Objective and study design**

To receive a first impression as far as the long-term effects of the Eco-Driving training are concerned, the 30 participants of the qualitative depth psychology-oriented impact analysis (see 3.1) were subjected to another depth psychology-oriented survey.

### **3.2.2 Results**

Long-term effects of the Ford Eco-Driving training could be identified on different levels:

- The training tips were partially implemented and integrated into day-to-day driving to the degree that they became automatic.
- The participants vividly recall the positive experiences they had during the training.

The long-term effects depend to a high degree on the different basic categories that the participants belong to:

- The "outgoing types" are often experienced drivers who feel confirmed in their relaxed manner of driving by the Eco-Driving training.
- The "shut-down types" close themselves to the dynamics and the experiences of the training. Changes are unwelcome and they provoke anxiety. Hence the tips are integrated into the daily driving routine only to a minor degree.
- The "fig leaf types" apply the tips rather infrequently. They refer to their participation in the training and use this as a pretext to stay with their usual driving style.

**Success as a motivating factor:**

The implementation of the tips in their totality seems to be the exception. However, most of the respondents do apply individual tips, such as shifting up early. In their daily routine, the participants of the Eco-Driving trainings often attempt to repeat the sense of achievement which they experienced during the training. Some of the test subjects however, miss the immediate confirmation of the fuel savings by means of a consumption metre. Two thirds of the interviewees reported a fuel economy improvement of one litre of fuel and more per 100 kilometres.



## Changes in the manner of driving as a development process:

The training ignites a development process in the participants. In their attempt to cope with everyday traffic, the test subjects experience the tips as an opportunity for further development.

## A boost to one's ego by acquiring a self-image of confidence and competence:

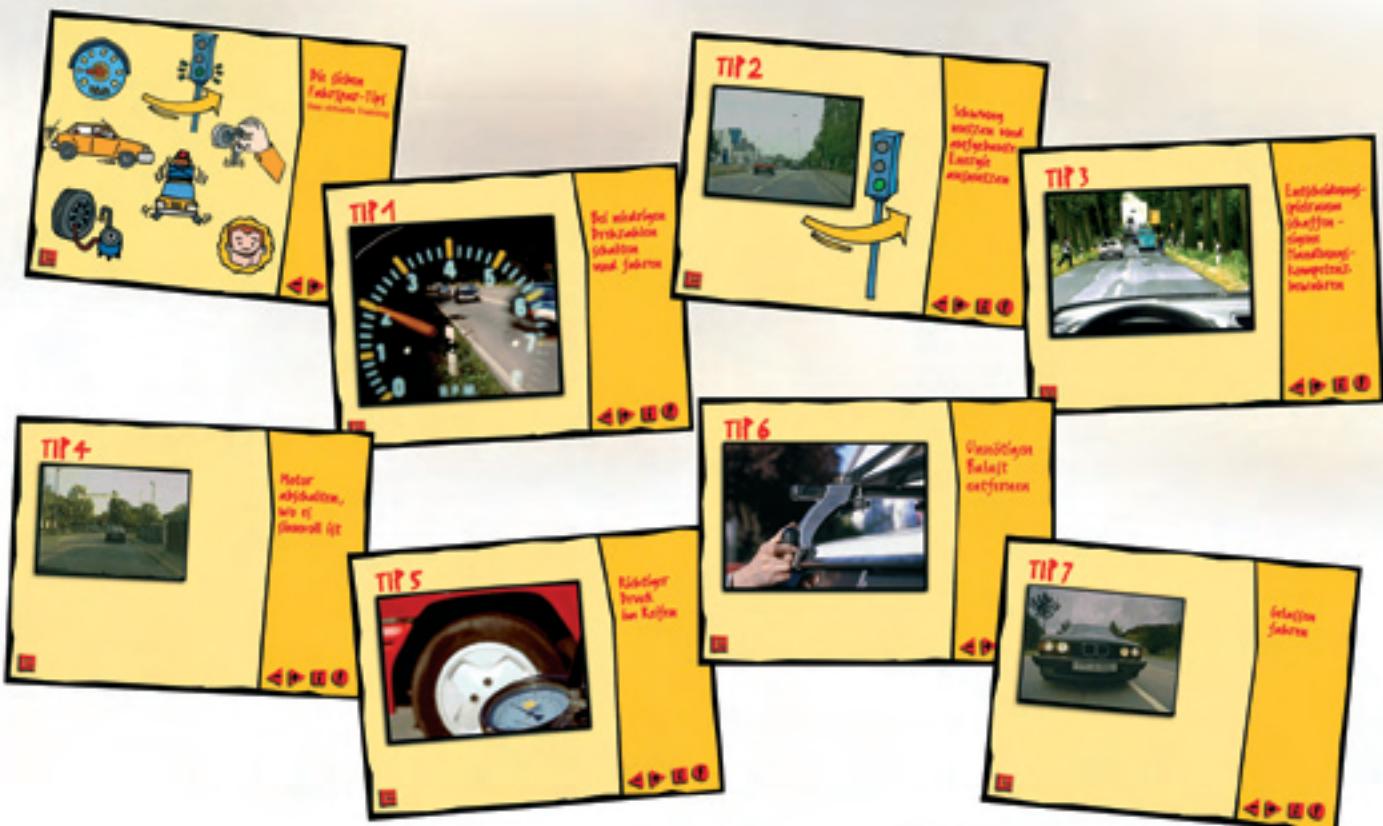
Once the tips are internalised and have been integrated into their own driving style, drivers experience an enormous boost to their egos and are able to acquire a self-image of confidence and competence.

## The environmental issue:

The environmental issue plays a minor role as car drivers generally push it aside and in the Eco-Driving training it is not really discussed as a problem.

## Results in numbers:

Application of the Eco-Driving tips in the daily driving routine		Ranking list of tips after application (multiple answers possible)		Fuel economy performance in everyday traffic according to the estimate of the drivers who are applying the above-mentioned tips	
Often to regularly:	66 %	Shift up early:	90 %	circa 1.5 l/100 km	24 %
Occasionally to rarely:	14 %	Decelerate smoothly:	42 %	circa 1.0 l/100 km	66 %
Not at all:	20 %	Switch off the engine at traffic lights:	18 %	circa 0.5 l/100 km	10 %
		Other tips:	< 5 %		



### **3.3 Identification of the fair market value (using the method of contingent valuation) of the Eco-Driving training for private customers**

**July 1999**

#### **3.3.1 Objective and study design**

33 participants of the Eco-Driving training were given a questionnaire with the request to evaluate the training and to indicate an appropriate price. The main purpose of the survey was to identify a fair market value for the training using the method of contingent valuation as a basis.

#### **3.3.2 Results**

##### **Evaluation of the training:**

The training was given a very positive evaluation by the participants (overall average mark: 1.3). The marks 1 and 2 were given throughout. The participants were also very satisfied with their own fuel economy performance (mark: 1.6). The average fuel savings potential amounted to approximately 25 per cent. On the other hand, the participants generally viewed their own capacity of implementing the tips in their daily lives more critically, i.e. with the mark 2.1.

##### **Praise and criticism:**

As far as praise and criticism are concerned (which were openly addressed in the questionnaire), many of the participants made positive statements about the friendly atmosphere, the competent guidance on the part of the instructors and the training concept. The technology of the new vehicles and the opportunities for discussion offered during the trainings were also emphasized. Only a few critical remarks were made (e.g. on the short distances covered, on the fact that the participants did not practise with their own cars and that in some cases technical defects resulted in incorrect metre-readings).

##### **Pricing:**

In order to identify a fair price for the training, the method of contingent valuation was used to present participants with different suggestions for an adequate training price (e.g. 80, 90, 100, 120, 150, 180 and 350 German marks), which they were asked to evaluate. As far as the identification of the highest payment reserves is concerned, it is assumed that a price is acceptable when the majority of the respondents favour it. A corresponding result was achieved by adding up the responses to the closed and the open-ended question.



## **3.4 Results of the participant survey on the advanced training programme on Eco-Driving for driving instructors**

**Kay Schulte and Claire Wree, German Road Safety Council, April 2004**

### **3.4.1 Background and objective**

Eco-Driving for driving instructors is an advanced training programme organised by the Ford-Werke GmbH, the German Road Safety Council (DVR) and the German Federation of Driving Instructors' Association (BVF). In an all-day programme, driving instructors have the possibility of becoming acquainted with an economical and eco-friendly training in theory and practice.

Questionnaires were issued to evaluate the quality of the training. Some 500 driving instructors – mostly from the age group between 46 and 55 years – took part in the survey. They were asked specifically to assess the Eco-Driving programme as well as the instructor, the driving technique and the training as such. In some cases, the trainings dated back more than one year.

### **3.4.2 Results**

#### **Concerning the programme as such:**

Eco-Driving for driving instructors is a training that comes as a positive surprise to most of the participants. 86.7 per cent of them considered the training to be good or very good. 78.1 per cent stated that they were pleasantly surprised by the quality of this advanced training unit. The methodology was perceived as adequate: 75 per cent of the participants praised the successful execution of the all-day programme. Great importance was attached to the manual. 84 per cent deemed it helpful. The participants also saw it as positive that the training gave them the opportunity of becoming acquainted with a new vehicle.

#### **Concerning the instructors:**

Even among colleagues, the competence of the instructors was acknowledged (approval rate higher than 90 per cent).

#### **Concerning the driving technique:**

Even some of the reputed professionals were surprised when they found out that they were indeed able to drive at low revolutions in the way they did. 40 per cent of the driving instructors admitted: "I had not expected that you could drive at low revolutions in this way". 36 per cent agreed with the statement: "Prior to the training I had not expected that you could drive the vehicle in this way".

#### **Concerning the training techniques:**

The goal of prompting participants to call into question their own behaviour patterns and to adopt new behaviours seems to have been reached with respect to the driving instructors as well. 40 per cent of them hold that the training techniques could easily be integrated into driving school lessons. 35.3 per cent believe this to be at least partially possible. 39 per cent felt encouraged by the training to reassess their own training concept. 24 per cent think that this manner of driving is too complicated for learner drivers and that it would require some driving experience.



## **3.5 Results of the survey accompanying the "Eco-Driving compact" training**

### **3.5.1 Background and objective**

"Eco-Driving compact" is the one-hour version of the "Eco-Driving – managed by DVR" programme. It was developed along the lines of the BG/DVR fuel-saving driving lesson and worked as follows: The Ford-Werke GmbH gave away free vouchers for participation in the "Eco-Driving compact" training via regional dailies. The programme was then conducted locally by instructors who are normally involved in the fuel-saving driving lesson. Upon receiving the voucher, the candidates were given a questionnaire containing 5 questions on the training. A total of 462 vouchers were returned; the average ages were 49 and 36 years respectively, the annual driving performance amounted to about 15,000 kilometres.



### **3.5.2 Results**

All the participants gave very good marks to the training programme. They liked the training (mark 1.48 on a scale from 1 to 5). The instructors were given an even better evaluation (mark: 1.36). It was said that the training made allowances for the normal way of driving (mark 1.69), and that Eco-Driving mostly fitted in with everyday driving techniques (mark 1.74). The informative flyer on the "Eco-Driving compact" training was given the lowest marks (mark 1.82). However, even that is still a good result.



## 4. International Eco-Trainings

### 4.1 Eco-Driving Europe – a manual on the promotion of an Eco-Driving style

Austrian Energy Agency

#### 4.1.1 Strategies for the dissemination of an Eco-Driving style

The most effective way of disseminating an Eco-Driving style is to incorporate it into driving school trainings. During the training, the Eco-Driving style should be taught as a normal manner of driving.

In order to reach this goal, the following strategies are recommended:

1. Driving instructors and inspectors who favour innovations should become part of a network which supports the development of Eco-Driving.
2. Driving instructors and inspectors should undergo Eco-Driving trainings together in order to increase the driving instructor's motivation to spread the new driving style.
3. The driving instructors should be provided with excellent teaching material.
4. A regulatory framework for achieving this goal should be set up.

Central tasks of national Eco-Driving programmes include:

1. Development of a range of high-quality and diverse trainings (in road traffic/on the simulator, one-hour courses, half-day and all-day courses)
2. Distribution of a product by the name of Eco-Driving supported by its partners (motoring organisations, environmental groups, car manufacturers etc.)
3. Evaluation and continuous improvement of Eco-Driving
4. The use of opportunities which present themselves
5. The safeguarding of quality standards for driving instructor trainings
6. The opening up of business segments for instructors

#### 4.1.2 The significance of quality standards

Having confidence in the tested quality of Eco-Driving is a basic prerequisite for building up a market for this product. It is only due to this fact that companies decide in favour of Eco-Driving and only then do driving schools incorporate it into their regular driving training. Therefore,

- both the instructors and the training should be certified,
- the instructors should be trained and trained further in the best possible way; their performance should be checked in regular intervals and
- the training materials should be optimized.

### **4.1.3      Simulators and computer games**

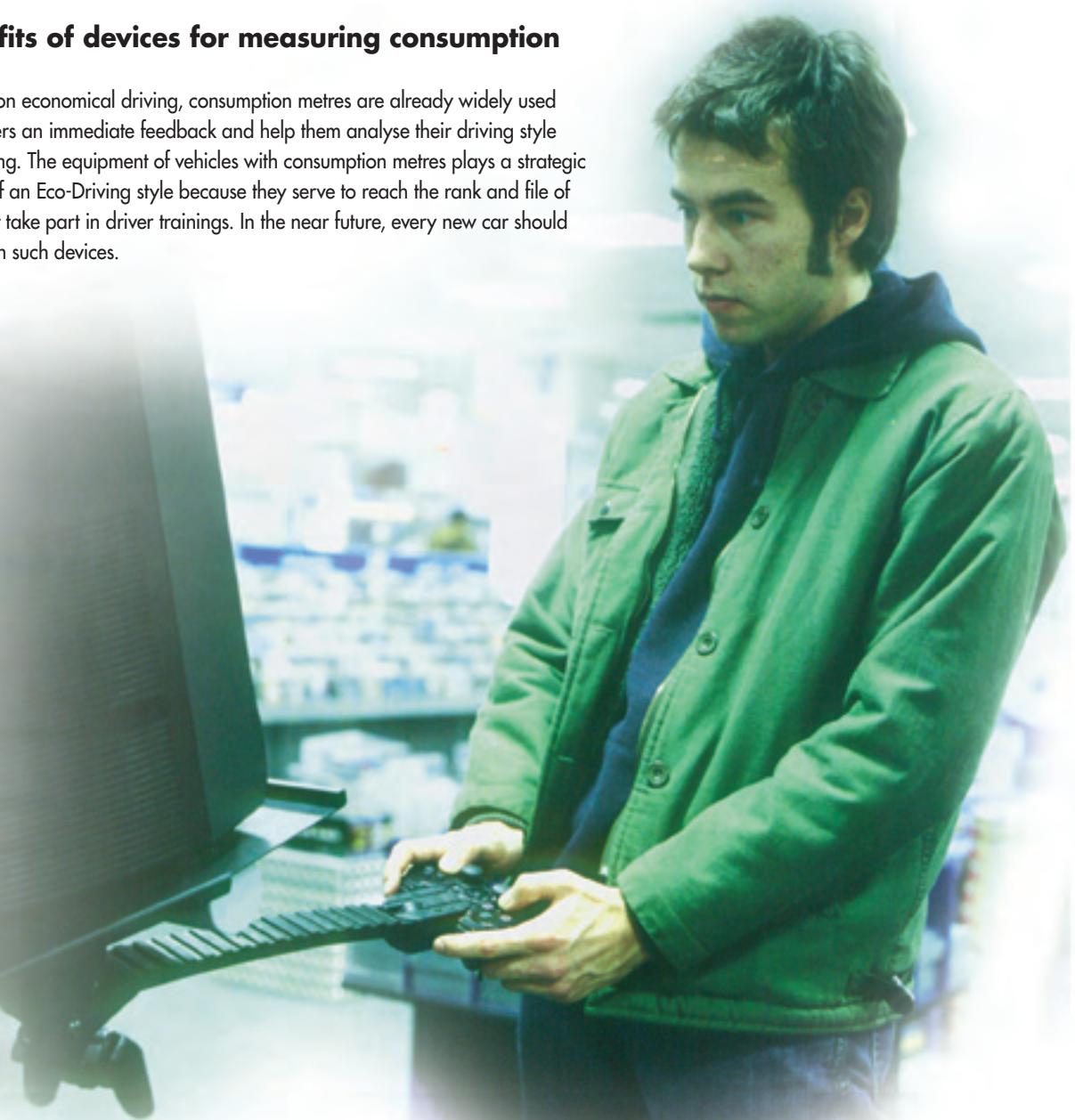
Simulators and computer games on the subject make eco-driving more accessible – especially to young people. Whether online or installed on their PC, they act as an appetizer. They can have a positive impact on the Eco-Driving image and as give-away articles contribute to disseminating this new driving style.

More and more often, low-cost simulators are not only used to arouse interest during events, but also as a part of normal driving tuition. Even though people usually find it easier to transfer their experience of an on-the-road training to their daily routines, there are also some convincing arguments for the use of simulators:

- They enable a driving instructor to coach several individuals at once.
- The training is conducted without the risk of accidents and without harmful emissions.
- The training drives can be analysed and repeated more easily.

### **4.1.4      Benefits of devices for measuring consumption**

In the context of trainings on economical driving, consumption metres are already widely used in vehicles. They give drivers an immediate feedback and help them analyse their driving style before and after the training. The equipment of vehicles with consumption metres plays a strategic role in the dissemination of an Eco-Driving style because they serve to reach the rank and file of the car drivers who do not take part in driver trainings. In the near future, every new car should therefore be equipped with such devices.



## **4.2 Summary: Evaluation of Eco-Drive training courses – Eco-Driving Europe**

**Hornung Wirtschafts- und Sozialstudien on behalf of Quality Alliance Eco-Drive and the Swiss Federal Office of Energy (BFE), January 2004**



### **4.2.1 Background and objective**

Under the umbrella brand of "Eco-Drive", various training forms for a safe, comfortable and economical manner of driving have been developed and evaluated in Switzerland in the last few years. The present study summarises the results of the various evaluations in order to enable an overview of the effectiveness of the various Eco-Drive trainings.

For time and cost reasons, some of the individual studies had to be based on a relatively small number of readings. The study design also differs. Nevertheless, certain conclusions can be drawn from the results.

### **4.2.2 Training models under examination**

**All the different training types teach the four golden Eco-Drive rules:**

- Drive in the highest possible gear at a maximum of 2,500 rpm
- Accelerate steadily
- Gear up early (at 2,500 rpm at most) and gear down late
- Think ahead and drive evenly; avoid unnecessary braking and gear-changing

**The various training models are**

- all-day courses with theoretical elements and practical training on the road (Eco-Drive courses, evaluated in the years 1995 and 2000)
- half-day courses with theoretical elements and practical training on the drive simulator (Eco-Drive simulator courses, 2001)
- simulator drives of about 15 to 20 minutes' duration with brief instructions and an explanation of the main principles of Eco-
- driving (simulator demonstration driving, 2003)
- Training units as part of the training of new drivers, two sessions of two hours to demonstrate the principles of Eco-driving in the driving instructor's car (Eco-Drive at driving school, 2003)

### **4.2.3 Results**

#### **4.2.3.1 Results in general**

The participants gave good to very good marks to the Eco-Drive courses: competent course instructors, instructive theoretical explanations etc. In the simulator trainings, suggestions for improvement mostly refer to an improvement of the simulator itself as well as to a more hands-on training, as the simulator was perceived as fairly unrealistic.

In the individual studies, the impact of Eco-Drive is measured by means of consumption and of the so-called Eco-ratio (= speed divided by consumption). The higher the Eco-ratio, the better is the result from an ecological point of view.

Most of the individual studies showed that in the medium and the long term it is possible to save about 10 to 15 per cent of fuel with an Eco-driving style even without driving more slowly than before. The study on "Eco-Drive at driving school" did not show any statistically significant successes – both in terms of fuel consumption or in terms of the Eco-ratio.

In the other courses, the Eco-ratio was 15 to 22 per cent higher than in the reference groups. In the Eco-Drive courses with learner drivers (evaluation in 1995), after 17 months it was even 45 per cent higher.

#### 4.2.3.2 Results from individual studies

##### Eco-Drive courses, 2000

- Following the Eco-Drive courses, the average speed of the participants of the course was 2.5 per cent higher than that of non-participants.
- The participants drove far more smoothly (about 1/5 fewer gear changes).
- 34 per cent lower braking, acceleration and lateral forces, which results in increased driving comfort and a lower vehicle wear and tear.
- Theoretical knowledge on the Eco-Driving style is not sufficient. In comparison to the participants with a comparable level of knowledge, non-participants had significantly lower Eco-ratios.

##### Eco-Drive simulator courses, 2001

- The number of gear changes was reduced by one third.
- The average speed remained roughly the same.
- The driving comfort evidently decreased because a device that registers centrifugal forces showed a significant increase in value for some participants.
- 86 per cent of the respondents agreed with the statement that the simulator is an appropriate device for learning the Eco-driving style.

##### Simulator demonstration trials, 2003

- The short-term increase of the Eco-ratio by 15 per cent is lower than that of the considerably longer Eco-Drive simulator courses (20 per cent).
- Remeasurements conducted 6 to 8 months later confirmed that the learning effect was lasting.
- Due to small group sizes, the figures must be assessed with caution. Nevertheless, the results of the other studies were confirmed.



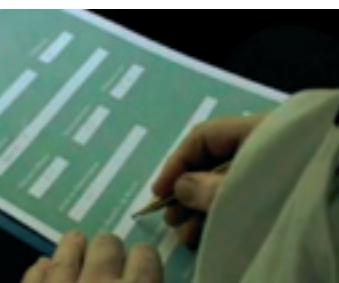
##### Eco-Drive in driving schools, 2003

- The results of the other studies as far as fuel consumption and Eco-ratio are concerned could not be confirmed. There are several possible explanations for this:
  - The test drives were carried out on the simulator, and the learner drivers, who were comparatively younger, even on their first simulator drive found their bearings better than older drivers.
  - The learner drivers from the reference group were also familiarized with Eco-Driving principles as part of their normal driving school training.
  - It seems appropriate to incorporate an Eco-Drive module – as had already been considered – into the second phase of the driving training as the learner drivers have more driving practice at that time.



## **4.3 Report on findings concerning emissions and fuel consumption with Eco-Drive – Quality Alliance Eco-Drive, Switzerland**

**Dr. Martin Weilenmann, Swiss Federal Laboratories for Material Testing and Research (EMPA), January 2002**



### **4.3.1 Background and objective**

In cooperation with the Swiss Agency for the Environment, Forests and Landscape (BUWAL) and the Quality Alliance Eco-Drive, the Swiss Federal Laboratories for Materials Testing and Research (EMPA) were commissioned to examine the effects of the Eco-Driving style on pollutant emissions as well as fuel consumption. Particular as far as the emissions were concerned, previous studies on the subject had partially led to diverse results.

### **4.3.2 Study design**

Because of the costs involved, the differences in fuel consumption and emissions between a conventional driving style and the Eco-Driving style in road traffic were not measured. Three driving patterns from the latest BUWAL measuring programme which correspond to everyday traffic flows within city limits served as a basis for the measurements. The normal way of driving and the Eco-Driving style were characterised in a very simplified form by means of different strategies for changing gears. – A normal driver with a conventional driving style shifts up at circa 3,000 rpm, and therefore shifts down early as well ("Normal 3,000"), a driver with an Eco-Driving style shifts up at 2,000 rpm and uses the highest possible gear in each case ("Eco2,000").



### **4.3.3 Results of the emission and fuel consumption measurements**

By means of "Eco2,000", fuel consumption within city limits decreases by 17.6 per cent as compared to "Normal3,000". Carbon dioxide (CO<sub>2</sub>) emissions decrease by 18.4 per cent and nitrogen monoxide (NOx) emissions by 52 per cent. On the other hand, the rates of carbon monoxide and hydrocarbon increase by more than 191 per cent and 66 per cent respectively.

	CO (g/km)	HC (g/km)	NOx (g/km)	CO2 (g/km)	consumption (g/km)
Eco2.000	1.4136	0.0768	0.0427	168.51	7.233
Normal3.000	0.4854	0.0462	0.0874	206.55	8.779
Difference	+ 191.24 %	+ 66.34 %	- 51.13 %	- 18.42 %	- 17.61 %

### **4.3.4 Recommendations on the emission-optimized implementation of Eco-Driving**

To save fuel and keep pollutant emissions at a minimum, it is advisable to shift up relatively early and to accelerate gradually during acceleration phases. Furthermore, one should drive in the highest-possible gear. Vehicle manufacturers should continue to develop their engines so that even at a lower rpm range or when carrying a heavy load, they work without enrichment and therefore do not produce higher pollutant emissions.

## **4.4 Impact Analysis on Het Nieuwe Rijden, Netherlands**

**NEA Transportonderzoek en -opleiding, May 2005**

### **4.4.1 Background and Objective**

The Dutch programme "Het Nieuwe Rijden" (HNR) aims at assisting professional drivers in learning a modern driving style which takes account of state-of-the-art engine technology. This eco-driving style is designed to improve driving comfort, increase road safety, reduce fuel consumption and increase driving pleasure. The intention of the survey was to identify the possible benefits of the HNR programme.

### **4.4.2 Study design**

The study was based on comparative economic and operative data from shipping companies. Based on the annual rate of change, a trend analysis was carried out to show important developments. Companies which enable their drivers to participate in HNR trainings and which monitor the driving behaviour of their staff were distinguished from companies which do not support their staff in this way. The latter were used as the control group.

The following parameters for the years 1996 to 2003 were to be investigated in detail:

- Fuel consumption
- Maintenance costs
- Repair costs incurred due to accidents as an indicator of road safety
- Absence from work due to diseases or accidents

The initial plan entailed an examination of both freight and passenger traffic. However, due to the fact that during the period in which the study was conducted, only a small number of companies with passenger traffic have taken advantage of the HNR programme, it was not possible to measure the effects of HNR on this group.



#### **4.4.3      Results**

Fuel consumption among the HNR companies decreased by 2.1 per cent. At an average fuel price of 68 EUR per 100 litres (inland quantity price/bulk purchasing including discount), this corresponded to savings of 0.40 cent per kilometre.

Thanks to HNR, maintenance costs could be reduced by 3.5 per cent. This corresponded to savings of 0.19 cents per kilometre.

The impact on road safety can be determined by looking at the repair costs for minor accidental damages.

During the period of examination, they declined by more than 14 per cent, corresponding to savings of 0.39 cents per kilometre.

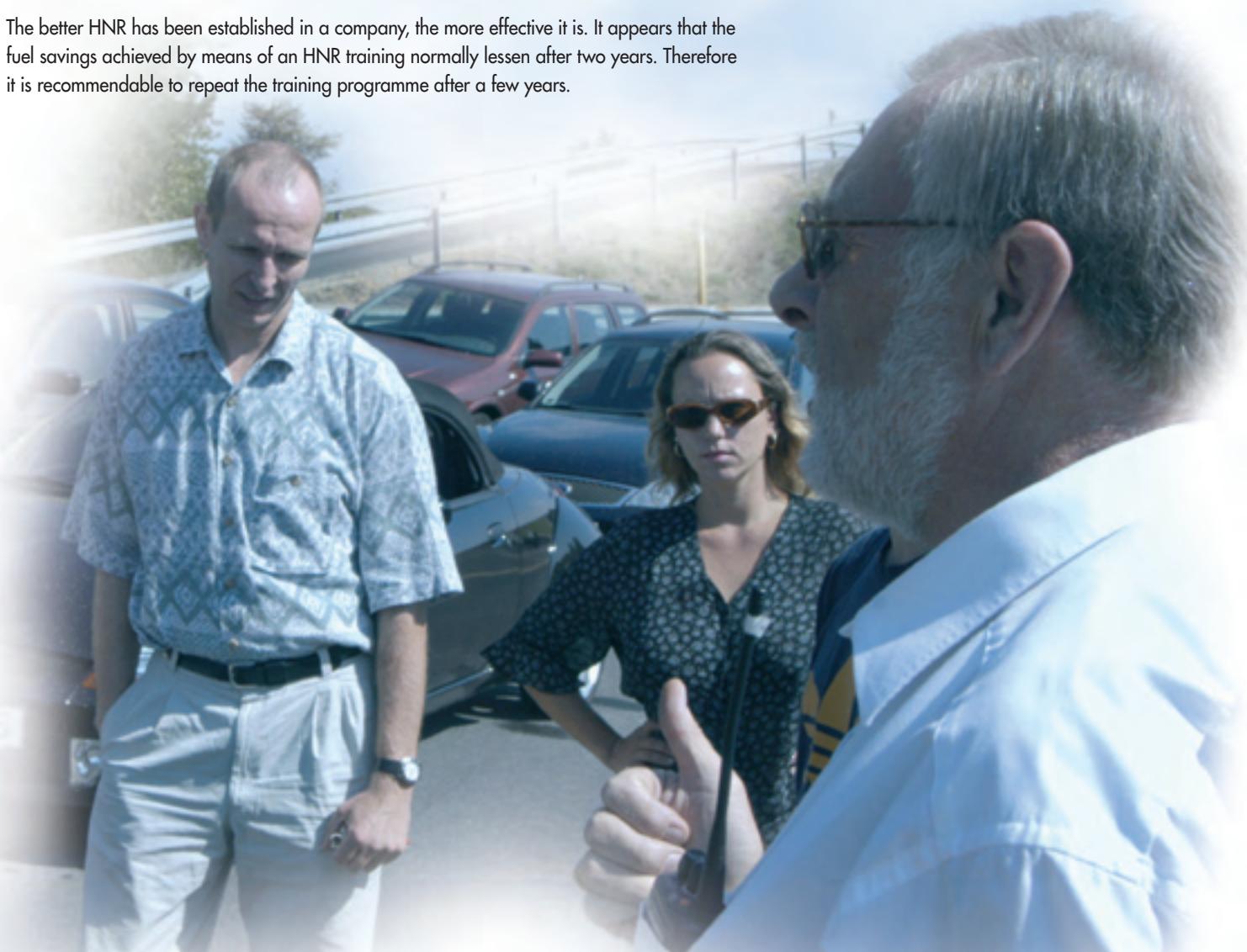
This means that with the help of HNR in freight traffic alone, costs for fuel consumption, maintenance and repairs could be reduced by 0.98 cents per kilometre. For a lorry with a mileage of 80,000 kilometres per year, this amounts to annual savings of 800 EUR.

available since 2001, the impact of HNR on absenteeism could not be researched. As heavy goods vehicles in international carrying traffic cover distances of up to 140,000 kilometres, fuel savings amounting to 1,400 EUR can be expected.

Since reliable date for measuring absence from work have only been

#### **4.4.4      Summary**

The better HNR has been established in a company, the more effective it is. It appears that the fuel savings achieved by means of an HNR training normally lessen after two years. Therefore it is recommendable to repeat the training programme after a few years.



## **4.5 Modern technology and the measurement of the effects of fuel-saving on driving trainings in Sweden**

**Anders af Wåhlberg, University of Uppsala, 2002**

### **4.5.1 Background and Objective**

The goal of the deliberations undertaken in the run-up to the study was to find a criterion which could be used to prove long-term changes in driving behaviour – a metered value that would be appropriate for proving the effects of Eco-Driving trainings independently of fuel consumption. The study focussed on the modification of the acceleration scheme as a consequence of the training. The acceleration schemes of a driver remain stable on a long-term basis. They are part of a person's individual driving style and are hard to influence or change. However, as they have a strong influence on fuel consumption, they are very likely to be changed by the Eco-Driving training.

The study was looking to answer the questions whether based on certain acceleration schemes, conclusions could be drawn on a person's fuel consumption, and whether clear differences between test runs with different acceleration variables could be made out.

### **4.5.2 Study design**

35 test subjects – bus drivers and other staff working for bus companies – initially drove a certain route in their usual driving style. Then they were instructed in the Eco-Driving technique, and after the training they drove the same route again.

Comparative data from both drives were recorded and evaluated.



### **4.5.3 Results**

Acceleration schemes are indeed an appropriate means for measuring the effects of Eco-Driving trainings. The differences between the two drives could be determined by the different acceleration variables which changed as a consequence of the training: Due to the training, the average acceleration rate increased by 22.5 per cent. The average deceleration rate dropped (- 15.2 per cent) as well as the driving time (- 4.0 per cent) and the fuel consumption rate (- 14.7 per cent). In other words, both the increase in the average acceleration rate and the changes in deceleration are directly related to fuel consumption.

## **5. Project "A more expanded market for the drive safely and save gas along the way scheme" – Market surveys on Eco-Trainings**

**Carl Vierboom and Ingo Härlen, business psychologists, May 2004,  
on behalf of the German Road Safety Council**

### **5.1 Background and objective**

There is less demand for the training programme "drive safely and save gas along the way" than corresponds to its use and its conceptual design. The result of this project was to



- highlight the situation of carrying companies and their training needs from the point of view of senior management,
- develop a requirement profile for the media, for talks, mailshots etc., and thus ultimately contribute to an increase in demand
- identify conditions and starting points for the best possible placement and communication of the training to senior management,

### **5.2 Study design**

Between February and April 2004, a total of 15 interviews was conducted with experts who were in charge of the vehicle fleet of their company, for example. The municipal and private-sector businesses/companies originated from different economic sectors. 9 interviews were held in West Germany, 6 in East Germany.

### **5.3 Municipal and private-sector vehicle fleet management from a psychological point of view**

Fleet managers are required to guarantee mobility services according to the demands of the market (the customers). In an increasingly competitive environment, safety and reliability are becoming more and more important, as exemplified by maintenance and care, industrial safety and accident prevention.

Adversities in the market, in road traffic and in organisational procedures interfere with the normal operations in the vehicle fleet: delivery times must be adhered to, additional services for the customer must be provided unscheduled, and traffic jams and a high traffic volume need to be taken into account, too. Due to changed market conditions, organisational deficits have the same effect as gravel in the gearbox. For the commercial success of a company it

is vital that it is capable of mastering such adversities. Accordingly, many companies have recognised the importance of factors such as safety regulations, advance planning and certification. In this context, the "drive safely and save gas along the way" scheme can be of immense value to the company.

The principal duty of the vehicle fleet management is to keep its operations running smoothly. The entire

image of a company is affected to some degree by its vehicle fleet. As a kind of mobile PR officers, the drivers meet with approval. This is evidenced by the numerous little pieces of equipment in their vehicles (from a cupholder to a hands-free kit to a navigation system with a personal digital assistant). Reward schemes and salary structures that are tied to consumption and wear and tear data, for instance, can be used as incentives to increase performance.

Fleet managers must aim to use system resources intelligently. This includes that staff anticipate problems before they arise and that they bring in their experience, from the area of vehicle procurement to the optimization of operational processes. However, as far as the means of production are concerned, initially the main focus seems to be on the technical solutions (GPS, software solutions in material planning, shipping note handling via handheld scanners, direct injection for optimum consumption, on-board computers etc.). Several times, fleet managers mentioned "Eco-Trainings" as possible measures for training staff.

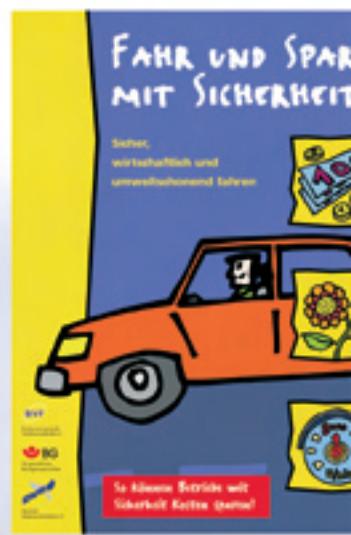
Fleet managers see themselves as if they were sitting in a virtual driving cab which allows them to keep an eye on the entire system and to set various adjustment screws to control the entire fleet. Such "adjustment screws" could be for example:

- reward systems for staff motivation
- optimized processes by means of certification
- technical solutions such as navigation, route planning etc.
- staff trainings

Changes in work organisation have also led to changes in the job description of drivers. Driving has become an accessory and has been incorporated into a guidance system. Fleet management has turned into a kind of workflow management in which all the highly complex areas of the fleet are interconnected. Traditional tendencies of fleet drivers to "enjoy life" in the private sphere of their vehicle have shifted. They now find expression in the fact that they have a say in analysing problems and finding solutions to them, that they participate in the

procurement and equipment of their vehicles, and in a cautious, proactive and fuel-efficient manner of driving, which in turn is honoured by means of performance- or cost-related reward systems.

A training programme such as the "drive safely and save gas along the way" scheme seems well-suited to help drivers develop a relaxed driving style and create more freedom for action. Companies which have already implemented this programme report that it has had a positive effect on the guidance system of the company. However, this effect is not emphasized enough in the company's guidance system.



## 5.4 Specification of requirements and recommendations to communicate trainings and training programmes in vehicle fleets

■ Do not offer or place training programmes as stand-alone solutions, but as a module in the context of the total system of the vehicle fleet.

It should be communicated

→ that the mobility performance of the entire fleet will benefit from the training,

→ that the training will improve the image and the public perception of the company and increase customer and staff satisfaction,

→ that trainings are up-to-date measures to increase interconnectedness within the company.

■ Integrate trainings into business procedures in such a way that they do not interfere with them and that costs are minimised. The training concepts should be tailored to the needs of the respective fleet. The more a training can be adapted to and made compatible with the company's business procedures, the lower the costs of giving paid leave to staff will be.

■ To emphasize the practicality of the training:

→ Further training and training programmes should be offered to decision-makers as "sample units" in order to convince them of the impact of the training. Offers of this kind are perceived as a sign of open-mindedness and they reduce the fear of the unknown.

→ The various uses of the training should be communicated. It should be attempted to repeat the trainings on a continual basis.



**Seit dem achtziger Jahren im Trend!**

Anfang der achtziger Jahre entdeckten die großen Pädagogisch-pädagogischen Hochschulen ihre „Fahrzeughalle“ als hochinteressante didaktische Raumgenossenschaften, um den Fokus auf ihrer Handlungsfähigkeit zu legen. Das in der Hochschule funktionierende „Fahrzeugmodell“ wurde in der Folgezeit fortgeschreitend ausgebaut und ist der Ausgangspunkt des 21. Jahrhunderts geworden.

### Prävention im Fahrzeugtag

1997 konzipierte die gesetzliche Berufsgesetzlosen-, die Ausbildung von Fahrsicherheitsberatern e.V. und die Deutsche Hochschule für Verkehrswissenschaften gärtner „forschen, untersuchen und unerwünschtes führen“ für die Sicherung von Fahnen in den Betrieben.

Die internationale Wissenswertigkeit für alle Hochschulen (HfV) war dieses Themenangebot bei der Förderung herausragende Ausbildungsinstitution des 2. Platz qualifiziert.

1998 wurde das Programm in Deutschland erweitert und unter dem Namen „Ziel und Ort der Sicherheit – Berufe, wirtschaft und gesellschaft“ unter der Leitung der gesetzlichen Berufsgesetzlosen- und der Deutschen Hochschule für Verkehrswissenschaften e.V. für die Hochschulwelt organisiert.

Die Ergebnisse einer bundesweiten Lehrkraftbefragung bei Lehrenden des Hochschulwesens im Jahr 2000 werden in das neue „Modell-Ausbildung“ integriert und die Programmentwicklung entsprechend überarbeitet.

Die Qualifizierung im seither „Hochschule fürg fahrt Sicherheit“ und einer hochwertigen Fortbildung.

### Das „Alt-Wissen-Game“

- Reduzierung von Mängeln und Unfällen auf Werke und Betrieben
- Erfüllung der Präventionsaufgabe durch ausreichend und gezielte Lehrzeit
- Förderung der Fortbildung/Foto durch gemeinschaftliches Erarbeiten von Lösungen und Techniken
- Reaktion Wissenslücke durch nicht aggregative Fortbildung
- Synthese von Theorie, Praxis und Didaxe
- Interagition für Bereichs- und fachliche Nutzung zum Wissenspool



**Hilfkräfte**

Selbst einfache Taxis mit großer Wirkung

- Gehobenes Service
- Erreichbarkeit/Anrufmöglichkeit :

  - Handynummer erreichbar
  - Auf erhöhtem Draht - in der Befestigung
  - Bei meistiger Nutzung - automatische Anmeldung
  - Schaltung und telefonische Beratung wünschen
  - Kosten abrechnen, was sie ansetzt ist
  - Rufnummern

## ■ Communication strategy

- Avoid the conventional "driving school comm.". Up-to-date, future-oriented images should take centre stage, e.g. the fleet of cars as a gearing mechanism with an aesthetics of its own.

- Represent the drivers or staff members as individuals who have a say in the affairs of the company.

- Emphasize that participants will gain leeway, become more relaxed and get additional benefits which they can use in their private lives.

- Emphasize that one of the formulas for the success of the trainings is that they are voluntary.

- Avoid negative connotations in the form of supervision, surveillance, additional training sessions or sanctions. The impression must be avoided that the training is enforced.

- Show that the training caters to changes in the job descriptions of both fleet managers and drivers, and that it is modern, up-to-date and flexible.

## ■ Share references

- References that serve to underline the reputation of the company should be collected and elaborated upon: company names, showcase projects, recommendations.
  - The effectiveness of the training programme should be demonstrated by means of success stories and figures as well as by means of certifications. They should be communicated aggressively.

## ■ Use multipliers

- Trainings at management level or with selected staff members (opinion leaders) can have multiplier effects.
  - These pilot trainings could be labelled with the heading "imparting knowledge".

- Use different media as communication aids

- Written arguments help promote the trainings among executives, superiors, colleagues and staff.
  - Within the company, professionally edited materials could be used to inform about the trainings.
  - Succinct pieces of information that prove that the training takes the system requirements of the vehicle fleet into account could be posted on the intranet and/or internal communication systems.

## 6. Safety and environmental protection – how the programme "drive like a pro – safe driving, both in a professional and a private context" has developed

Since the 1980s, environmental protection has become a top theme in politics as well as in industry and society. Early on, the instructors of the German Road Safety Council (DVR) have been aware of the fact that environmental protection and road safety are actually two sides of the same coin as eco-driving is both safe and economical. Hence on the initiative and with the support of the DVR a wide range of training programmes and courses have been developed, all of which include driving practice in real-traffic situations.

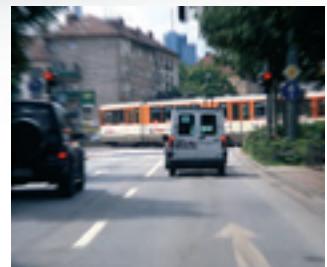
The German Road Council pays close attention to the fact that the implementation of the trainings be evaluated by scientific methods in order to record and keep track of the training impact and preclude the possibility of counterproductive effects. For new programmes, a sustainable evaluation should be made compulsory.

### "Drive safely and save gas along the way"

Since late 1995, the DVR and the Institutions for Statutory Accident Insurance and Prevention for Trade and Industry have been developing the "drive safely and save gas along the way – safe, economical and environmentally friendly driving" programme. It is primarily aimed at companies which have a vehicle fleet of their own. Vehicle fleet operators and field staff have received training and further training either within or outside their own companies. These companies were meant to derive profit from the training programmes in several ways: more safety, a better environmental performance, considerable improvements in fuel economy, reduced wear and tear as well as lower repair and maintenance costs.

The behavioural techniques and tips collected in the context of the "drive safely and save gas along the way" programmes are used as the basis of the contents of all DVR eco-driving programmes to this day:

- Drive in a relaxed way
- Extend your scope of action by avoiding tailgaiting
- Check the tyre pressure frequently
- Drive at low revolutions and shift up as soon as possible
- Use momentum and take advantage of built-up energy
- Switch off the engine whenever and wherever appropriate
- Remove surplus weight.



As the training has been developed and implemented in conjunction with the German Federation of Driving Instructors' Association, a nationwide network of qualified facilitators with an ISO DIN EN 17024 certification was available right from the start: As early as 1997, 23 companies took part in the programme. In the meantime, several thousand employees have completed the training and quite a few companies were able to benefit from its remarkably positive effects.

In order to promote participation in the training among staff members and decision-makers within the company, training modules with the contents of the "Drive safely and save gas along the way" programme are integrated into already existing seminars run by the Institutions for

Statutory Accident Insurance and Prevention for Trade and Industry, e.g. those for safety experts and safety representatives. Furthermore, in specialised seminars organised by the DVR, the Institutions for Statutory Accident Insurance and Prevention for Trade and Industry

and the accident insurers, the "Drive safely and save gas along the way – safe, economical and environmentally friendly driving" programme is combined with other prevention programmes, such as "stress in road traffic" or "the world of emotions and its relevance for road traffic".

## "Eco-Driving – managed by DVR"

The positive experience gained from the above-mentioned programme prompted the DVR in 1999 to devise another training programme for teaching a safe, economical and environmentally friendly manner of driving in cooperation with the Ford-Werke AG. This training, which for the first time addressed itself to all motorists, was named "Eco-Driving – managed by DVR" and was first tested during the pilot phase in 1998 and 1999 and then developed further accordingly. In the year 2000, the DVR, the Ford Werke AG and the German Federation of Driving Instructors' Association presented the programme to the general public under the motto of "Changing gears more quickly, getting ahead faster".

The "Eco-Driving – managed by DVR" programme is a four-hour course which normally takes place at a Ford dealer's. It comprises several practice drives in everyday traffic which help the participants to adopt a more relaxed and more confident driving style. Result: The training leads to a reduction in fuel

consumption by 10 to 30 per cent – depending on the previous driving style –, as well as to increased safety and the protection of the environment. These effects were also documented by an investigation carried out by the WDR television programme "Plusminus". To this end, three professional drivers took part

From that time on, the recommendations given in the "Eco-Driving – managed by DVR" programme are to be found in all the instruction manuals issued by the Cologne car manufacturer.

## Schneller schalten, weiter kommen



in the training and their mileage was checked before and after the training. A female cab driver, a courier and a road safety expert of the Bonn police force saved between 17.1 and 32.5 per cent.

## "Eco-Driving for driving instructors" – "Eco-Driving for learners and new drivers"

**Tank leer,  
Nase voll?**

Wer früh hochschaltet und vernünftig fährt, kann bis zu 30 Prozent Sprit sparen. Das verbessert abendrin die Sicherheit, schonkt die Umwelt und beim Tanken hat man stets die Nase vorn.

**BG**  
Bundes  
Gesellschaft  
für  
Gesamtversicherung

**Deutsche  
Autoversicherung**

Starting from early 1999, teaching and learning a fuel-efficient and energy-saving manner of driving was included as a compulsory part of the driver's licence exam. It is estimated that some 800,000 young people between the ages of 18 and 25 get a driver's licence every year. A total of almost 1.3 million people in Germany attend a driving school in order to get a driver's licence in one of the three classes. The prerequisite for turning the new driving style into a subject for the driving test was to train the driving instructors in it first.

In order to guarantee the credibility and effectiveness of the training and the driving test, the driving instructors and inspectors, apart from having sufficient knowledge about an eco-friendly manner of driving,

were required to have a command of this driving style themselves and to exercise it because they are convinced of it. The 130 instructors certified in the DVR programme "Drive safely and save gas along the way – safe, economical and environmentally friendly driving" provided the driving instructors with the skills they needed to practice an eco-friendly manner of driving. However, the driving inspectors needed to learn the new driving style as well. Therefore, the 42 driving inspectors of the TÜV (Technical Inspection Authority) Rhineland/Berlin-Brandenburg located in Berlin received a hands-on further training by certified DVR instructors.

In 2006, the programme was repositioned in cooperation with the German Federation of Driving

Instructors' Association (BVF) under the name of "Eco-Driving for learners and new drivers". As a hands-on further training for driving instructors and inspectors it is meant to contribute to an even better integration of the basics of a safe, economical and eco-friendly manner of driving into the driving school training and to raise the awareness of new drivers for this topic even more. "Eco-Driving for learners and new drivers" is subsidized by the Federal Ministry of Transport, Building and Urban Affairs (BMVBS). The German Federation of Driving Instructors' Association accompanies the project as part of a campaign.

## The "fuel-saving driving lesson"

Since February 2002, driving schools all over Germany have been offering another modified training unit under the name of "fuel-saving driving lesson", which has been developed by the DVR in cooperation with the Institutions for Statutory Accident Insurance and Prevention for Trade and Industry and the German Federation of Driving Instructors' Association. Under the qualified supervision of a driving instructor, all motorists have the opportunity to familiarize themselves with a fuel-efficient and environmentally friendly manner of driving. The "fuel-saving driving lesson" takes place in normal road traffic, ideally on those routes used by the motorists in question in their everyday lives. The one-hour training focuses primarily on three particularly effective tips in order to permanently reduce individual gas consumption:



- Use momentum and take advantage of built-up energy,
- Create scope for decision-making by avoiding tailgating,
- Drive at low revolutions and shift up as soon as possible.



## "The Eco-Driving compact training"

In addition, since April 2002 the so-called "Eco-Driving compact training" has been offered. According to the principle of "one trainer, one participant, one hour of training", this training is another chance for participants – albeit in a very short period of time – to receive tips and to familiarize themselves with an economical and safe manner of driving. This joint initiative organised by the car manufacturer Ford and the DVR was, once again, held in close cooperation with the German Federation of Driving Instructors' Association so that the one-hour training sessions could be carried out under the guidance of particularly well-qualified driving instructors. On a nationwide basis, more than 1,000 instructors are available for this training.

## "A new manner of driving"

The year 2002 also marked the beginning of the campaign "A new manner of driving – clever, safe and further". This joint initiative by the German Association of the Automotive Industry (VDA) and the German Road Safety Council (DVR) was designed to teach motorists an economical and safe manner of driving without them having to dispense with their driving pleasure and comforts. The campaign was held under the auspices of the Federal Ministry of Transport, Building and Urban Affairs (BMVBS).

The campaign website [www.neues-fahren.de](http://www.neues-fahren.de) not only lists the relevant tips for an eco-friendly driving style, but it also contains numerous links which enable the interested visitor to establish direct contact with the providers of various Eco-training programmes. These are directed to individual motorists, to vehicle fleets as well as truck and bus drivers.

Apart from the DVR and the VDA, the Association of International Motor Vehicle Manufacturers (VDIK), the ADAC, the Deutsche Post AG, the German Federation of Driving Instructors' Association, the Institutions for Statutory Accident Insurance and Prevention for Trade and Industry and the Autoclub Europe (ACE) have taken part in this joint campaign.





## "The AMI fuel-saving driving lesson"

Since the spring of 2003, the German Road Safety Council in collaboration with the Association of International Motor Vehicle Manufacturers has been offering the "AMI-fuel-saving driving lesson" in the context of the annual Automobile Trade Fair (AMI) in Leipzig. At this fair, trade visitors are given the opportunity to get to know the vehicles of the participating manufacturers in normal road traffic while experiencing the advantages of a fuel-saving driving style.

With nearly 2,800 motorists showing interest in the programme, in 2008 the AMI fuel-saving driving lesson experienced a record rush of people. A total of 23 exhibitors, among them many renowned manufacturers from A like AUDI to V like VW, took part in the programme. In recent years, well over 10,000 fairgoers have taken advantage of this programme.

In the context of the AMI-fuel-saving driving lesson, the German Road Council and the Institutions for Statutory Accident Insurance and Prevention for Trade and Industry, the Leipzig Trade Fair and the VDIK also conducted a "fuel-saving rally" in the year 2006 where they tried to identify "the champions of all categories". The fairgoers with the best driving performance who were also

able to give correct answers in a short quiz on safety and fuel-saving were awarded a prize. Participants in the "fuel-saving rally" went on a 20-minute round trip through Leipzig in the company of a professional instructor who introduced them to the fuel-saving driving techniques.

## "Eco-Driving for natural gas vehicles"

"Drive with natural gas, save twice the amount". This was the motto of a universally unique campaign initiated by the Ford Werke AG and the German Road Safety Council (DVR) in October 2003. "Eco-Driving for

natural gas vehicles" was the first fuel-saving training destined for gas-powered vehicles: a customized Eco-Driving training designed to utilize the savings capacity of modern natural gas vehicles on the road in

the best way possible. The four-hour fuel-saving courses on natural gas vehicles are offered on the dealer's premises and are suited for fleet managers as well as for driving instructors and private motorists.

## "Eco-Trainings" at the IAA

"Saving fuel - a smart way to drive" was the title of the "Eco-Training" which was offered for the first time at the 2007 International Motor Show (IAA) in Frankfurt. Similarly to the AMI fuel-saving driving lesson, the 765 visitors who showed interest in this new training were given the opportunity to perform test drives in the company of an experienced instructor who showed them how to adopt a driving style enabling them to reduce fuel consumption and harmful emissions. Result of the IAA test drives: "Green driving" leads to an average reduction of 20.65 per cent in fuel and harmful emissions.

## "Transporter Coaching" and "Passenger Car Coaching"

"Transporter Coaching" and "Passenger Car Coaching", two new programmes developed by the German Road Safety Council, combine elements of the safety and the fuel economy trainings for the implementation in companies. The goal of the programmes is to

raise people's awareness for safety issues and climate protection within the day-to-day operations of the company. It became evident that two programmes with different approaches cannot be held on the same day, but that a didactic concept was required in order to combine both

programmes in an effective way. Since 2007, the programme, whose effectiveness has been confirmed in two different impact studies, has been offered via members of the German Road Safety Council.

## "Be a cool driver – save gas"

"Be a cool driver - save gas" is a programme which serves to raise the awareness of motorists for a safe, economical and eco-friendly manner of driving while also making a contribution to climate protection.

"Be a cool driver - save gas" is designed as a means for permanently establishing an up-to-date manner of driving among learner drivers via the normal driving training. The programme is divulged by making use of the multiplication effect.

From 2006 to 2008, the implementation of the programme "be a cool driver - save gas" was subsidized by the Federal Ministry of Transport, Building and Urban Affairs (BMVBS). It comprises a one-day further training programme for driving instructors (as part of their compulsory advanced training), for driving inspectors and driving instructors in training, a manual with incentive video spots and didactic resources to be used in the classroom, as well other types of communication suitable for adolescents.

In the context of project-related monitoring, the degree of acceptance of the communication measures was evaluated, further trainings and trainer workshops were subjected to observation and a comprehensive set of data was collected to help assess the training series. The results of these measures will be exemplified in the following.

At present, the manual on the programme "be a cool driver - save gas" is the most suitable publication for the above-mentioned target groups. Amongst other things, it distinguishes itself by the following features:

- The highest possible degree of up-to-dateness
- State-of-the-art scientific findings
- Modern didactics and modern media
- Consistent focus on the GDE matrix  
(Goals of Driver Education)

On account of international queries during the term of the project it became necessary to translate the manual into English and in this way make it available to experts outside of Germany. Simultaneously, a special edition was produced for the EU member state of Luxembourg as the Luxembourg Department for Transport has enabled all driving instructors in Luxembourg to participate in the "be a cool driver - save gas" further training programme.

On a scale ranging from 1 to 5, the analysis of the 3,486 available feedback forms resulted in a score of 2.05 for the manual and the corresponding media.

The one-day training on the whole was given a score of 1.99 (3,740 available feedback forms). In addition, participants of the further training were asked to specify to what extent their expectations in terms of the practical relevance of the programme for day-to-day use had been met. The 3,728 available feedback forms resulted in an average score of 2.16.

Project-related monitoring has shown that there are regions in Germany with an exceptionally high motivation to enable driving instructors to participate in a hands-on further training which meets future requirements, but that on the other hand, there are also regions which



unfortunately have as yet failed to recognize the opportunities offered by an up-to-date further training programme of that nature.

At the same time, the monitoring accompanying the training allowed for a demand-oriented readjustment of its didactic organisation while the project was still running. The success of this measure became evident in the data evaluation: Concerning the question "How easy, do you think, will it be for you to implement eco-driving in your driving trainings?", the average score increased considerably from 2.41 in the year 2006 to 2.21 in the year 2008.

The continuing demand for the "be a cool driver - save gas" scheme in the regions with a high motivation to make driving instructors benefit from the further training programme suggests that in 2009, driving instructors will once again grapple with modern didactics even though subsidies have been discontinued.

On the internet page [www.cool-fahren-sprit-sparen.de](http://www.cool-fahren-sprit-sparen.de), interested individuals will find pertinent information on the programme and its contents.

## **"Drive like a pro – safe driving, both in a professional and a private context" (working title: defensive driving DD)**

In cooperation with Exxon Mobil (EMPG GmbH) and the professional organisation of the mining and quarry industries, another research project and training was initiated and completed under the name of "Drive like a pro – safe driving, both in a professional and a private context". This training was meant to combine a driving style which protects the climate with other preventive elements and to guarantee safe driving in the daily work routine.

The didactic structure was modelled on the DVR programme "drive safely and save gas along the way", and it combines theoretical learning units with the exchange of ideas and a personalised practical unit. The training modules were matched closely with the needs of the company.

In the course of a one-day event, groups of six staff members each completed the following seven training modules:

**CBT Fatigue:** An interactive computer programme conveys facts and suggestions on the issue of driver fatigue. Apart from evaluating the answers given, a quiz offers additional explanations thus enabling an additional learning effect.

Recent changes in the road traffic regulations (the German StVO): Teams are formed to discuss and comment on recent changes in road traffic regulations.

**Deer pass:** This topic is given particular attention as many of the business-related trips of the EMPG GmbH lead through sparsely populated and often densely wooded areas.

### **Discussion of dangerous situations:**

Group members refer to dangerous situations in day-to-day traffic from their own experience and discuss them as a group by analysing and exchanging ideas on possible causes and alternative behaviour patterns.

**CBT Physics of driving:** This interactive computer programme focuses on facts and suggestions on how to handle loads, on braking and other aspects in connection with the physics of driving and safety considerations.

**Inspection of operational safety:** In this module, the vehicles of the participants are inspected in terms

of their operational safety, followed by a discussion of the consequences which the results might have on safety in general.

**Driving practice:** Accompanied by an instructor, the participants drive their own vehicles on known routes and in everyday traffic. This one-hour DD-Training (one trainer, one participant, one car) is a compact training in real-world traffic which combines the aspects of safety, economic efficiency and environmental protection.

In each case, the training was led by two certified instructors to guarantee close supervision – particularly in the "driving practice" module.

## **Evaluation: Results and benefits**

Shortly before the beginning of the training, the participants were handed out a questionnaire with questions on their expectations, their attitudes towards car driving and road safety as well as on their previous experience with road safety trainings. Immediately before and three months after the training they were asked for an evaluation and were once again questioned about their insights and their attitudes towards driving and road safety.

Subsequent to the training, all seven training modules were evaluated as exceptionally interesting, useful and important. The participants' expectations could be met or even surpassed. In particular, the participants gave a positive appraisal of the fact that their individual circumstances had been taken into account in the practical training and in the discussion of dangerous situations, that the training was of great practi-

cal relevance and that its contents met the demands they were faced with in everyday traffic.

The chances to implement the knowledge imparted to them in day-to-day life were rated as higher than average. The participants were convinced that they would achieve positive results if they resorted to what they had learnt in the training. The motivation to implement this

knowledge was exceptionally high. Right from the beginning of the training, the attitudes of participants towards car driving and road safety proved to be very positive. Nevertheless, their attitudes on these

matters improved even more during the course of the training. Positive results in this context could be summarized under the headers of increased competence, a heightened understanding of comprehensive

approaches and less willingness to take risks. This effect could be proven even several months after the completion of the course.

## Fuel-saving trainings at "Schäfer's Brot und Kuchen Spezialitäten" (Schäfer's bread and cake specialities)

In the vehicle fleet of "Schäfer's Brot und Kuchen Spezialitäten", the DVR training "drive safely and save gas along the way – safe, economical and environmentally friendly driving" was carried out for the first time with trucks of up to 7.5 tons of gross vehicle weight. In the workshops, which lasted up to 120 minutes, a maximum of 15 participants was imparted practical tips on how to behave in everyday traffic. The workshops were followed by a real-world driving training: Every driver was accompanied on his/her daily delivery tour (with an average duration of about 160 minutes) by an instructor who gave comments and tips for a fuel-saving driving style. Subsequently to the tour, the driver was provided feedback on his/her manner of driving.

### Evaluation: Results and benefits

The effectiveness of the combined safety and fuel-saving training was examined by means of a pre-post study with a treatment group and a control group. Before and after the training, the drivers were questioned and their driving behaviour was examined. The observers who accompanied the delivery tours noted down certain driving behaviour patterns, e.g. driving errors and fuel-saving behaviour (releasing the accelerator when approaching a red light) in an observation form.

The driving errors were classified as follows:

- Concentration or attention error, e.g. the driver fails to yield the right of way.
- Orientation errors, e.g. when turning the driver chooses the wrong lane.
- Risk errors, e.g. the driver falls below a safe distance.
- Procedural errors, e.g. when turning the driver is unsure in the handling of his/her vehicle.

Whereas in the preliminary survey the error frequency of both driver groups was similar, afterwards the driver group who had received training committed considerably fewer errors than the group without training. Their driving style was more relaxed and more defensive. The drop in risk errors was particularly evident. It seems that participation in the course resulted in a much more defensive driving style. There were even statistically significant changes in the drivers' attitudes: The members of the treatment group reacted to stressful situations – such as nose-to-tail traffic, time pressure because of tight deadlines, shoulder-runners on the highway – with less aggression and less willingness to take risks, e.g. by railing against other drivers or by tailgaiting.

Furthermore, the drivers who had received training tended to decelerate earlier thus using momentum. They drove more smoothly and in a much more proactive way and therefore saved a lot more fuel than before. In the driver group

which had received training the fuel economy in the second and the third month after the training amounted to 6.8 per cent. Six months after that, it was still at 3.7 per cent. In the control group which had not received any training, no such reduction in

fuel consumption occurred. During the test drives the speed of both groups was practically identical. The pre-post comparison showed that the journey time for the daily tour had not increased.

As the financial evaluation of the training programme demonstrates, the fuel-saving training had paid off for the company within one year:

Instructor fees, administrative costs	2,907 EUR
Compensation for workshop participation per 15 drivers	1,200 EUR
Costs:	4,107 EUR
Improvements in fuel economy p.a.:	4,725 EUR

0.9 l/100 km \* annual mileage (ca. 35,000 km) \* price per litre diesel (1,00 EUR, as per 03/2009)

Even when we consider that the price for diesel is relatively low at the moment, the savings potential still amounts to more than 600 EUR.

Assuming a price of more than 1,30 EUR for one litre of diesel, which was a perfectly normal price one year ago, the savings amount to more than 2,000 EUR. If we presume that in the following year

the fuel economy performance will decrease to around 0.5 l/100 km, further savings of 2,625 EUR will ensue.

Experience shows that additional cost savings result from the preservation of material and the lower accident rates that go hand in hand with a fuel-saving driving style.

However, both factors were not quantifiable in this study.

Reference: Zeitschrift für Verkehrssicherheit (3/2008)

## Communication platforms

Apart from the above-mentioned websites, the German Road Council has launched several websites to accompany the numerous trainings and programmes on the subject of eco-driving. They convey the details of a fuel-saving, safe and environmentally friendly driving style and also present – partly in the form of portals – the various training programmes which are available.

Under [www.spritsparstunde.de](http://www.spritsparstunde.de), visitors will find a calculator for the calculation of fuel costs, a quiz to test their knowledge on the subject, and a search function which will help them find a driving school close to their home which offers the "fuel-saving driving lesson".



Under [www.spritsparwochen.de](http://www.spritsparwochen.de), an action platform on the subject of fuel-saving, the German Road Council and its partners announce events and raffle off training vouchers. With the help of a calculator for the calculation of fuel costs, website visitors have the possibility of finding out their individual savings potential, as well as finding a training provider and feedback on their practice drive.



Tips on a "green driving style" can also be found on the webpage of the United Nations Environment Programme (UNEP) under the keyword of "greener driving" ([www.greener-driving.net](http://www.greener-driving.net)), which is supported by the German Road Council. On a cross-cultural basis, it primarily uses comic videos to promote an environmentally friendly driving style.





## **Impressum**

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