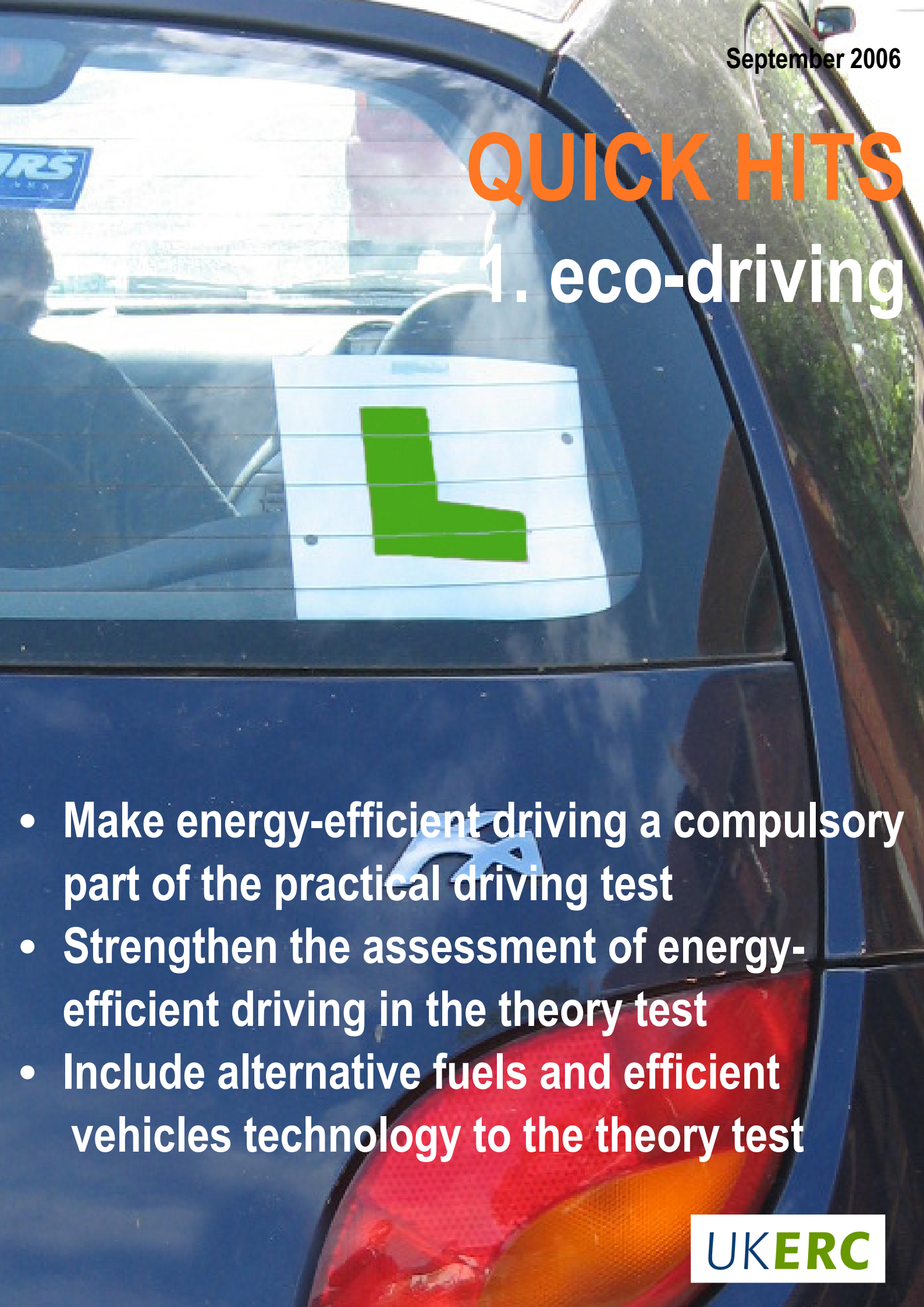


September 2006

QUICK HITS

1. eco-driving

- Make energy-efficient driving a compulsory part of the practical driving test
- Strengthen the assessment of energy-efficient driving in the theory test
- Include alternative fuels and efficient vehicles technology to the theory test

UKERC

What are Quick Hits?

Quick Hits are a series of proposed initiatives developed by the Demand Reduction theme of the UK Energy Research Centre (www.ukerc.ac.uk). They are intended to make a useful contribution in reducing carbon emissions by 2010, and are designed to be relatively easily for the Government or local authorities to implement. Legislative changes or expenditure needed would be small in nature, hence the title 'Quick Hits'.

The Quick Hit series is organised by Dr Brenda Boardman, Co-Director of the UKERC's Demand Reduction theme, at the Environment Change Institute, University of Oxford.
Further information on this Quick Hit is available from Jillian Anable, tel. 01224 263136 or Matthew Ledbury, tel. 01865 275893, both of the UKERC.
This Quick Hit was based on research by Helen Pearce of SEA Renue.

What is the Quick Hit?

The 2006 Energy Review stated that the Government intended to raise awareness of transport and climate change issues, and the approach would include, "developing initiatives on eco-safe driving".[1] This proposed Quick Hit would see energy-efficient driving, also known as eco-driving or eco-safe driving, incorporated into the practical driving test, to reinforce advice currently covered by the theory test. Furthermore, it would inform drivers about alternative fuels and efficient vehicle technology, and incorporate this new information into the theory test. While knowledge of issues such as alternative fuels would not affect the ability of a person to drive, driving lessons and the driving test present a suitable opportunity to raise awareness amongst drivers and positively influence their choices before habits are formed.

For logistical reasons, the Quick Hit is assumed only to apply to people taking a driving test, and would not apply retrospectively to licensed drivers. Making this a compulsory part of the driving test is important to reach a significant number of drivers, as sign up to voluntary driver training schemes such as Pass Plus is still relatively low at just 18% of new drivers.[2] It is also assumed only to apply to new car drivers in the first instance. Private individuals would be targeted, as a significant amount of information and advice is already aimed at professional drivers, and technical systems are available for monitoring the efficiency of larger commercial vehicles.

Including assessment of energy-efficient driving ability in the practical driving test

The practical driving test currently includes assessment of adherence to the speed limit and use of the correct gear, both of which contribute to fuel efficiency. The 'show me, tell me' requirements introduced in 2003 also include maintenance issues such as checking the tyre pressure. Additional practical actions that could be tested include smooth acceleration and braking, driving at the optimal speed, turning the engine off if stationary for more than a minute, or using cruise control if available. Also, greater emphasis could be made of the benefits of these measures in terms of fuel efficiency and environmental impact.

Strengthening the assessment of good practice for energy-efficient driving in the theory test

Aspects of the Quick Hit that can be covered in the practical test are limited; for example, there is little scope for testing a candidate on alternative fuels and vehicle technology while in the driving seat. The theory test offers an opportunity to conduct a more general test of the candidate's knowledge and understanding. The theory test has included questions on 'environment' type topics since 1998, and the existing test includes questions on fuel efficiency, the environmental impacts of car driving and various ways of reducing them. Good practice highlighted in the theory test includes maintenance, smooth acceleration and braking, driving within the speed limit, and even using alternative modes of transport where possible.[3] More questions are being introduced for the next update of the test taking place in September 2006.

However, coverage of energy-efficient driving and associated good practice in the theory test could be strengthened. Firstly, the number of questions of this nature likely to come up in any test is limited to one or two, meaning that a candidate could pass without answering them correctly. Also, the opportunity to stress the importance of efficiency is sometimes missed. For example of five possible multiple choice questions on tyre pressure, only two refer specifically to fuel efficiency, when in fact low tyre pressure can reduce efficiency by up to 2%. Research in the Netherlands revealed that if all Dutch car drivers inflated their tyres to the correct pressure, this would save over 100 million litres of fuel per year.[4] Issues that could be emphasised further in the theory test include reducing the drag factor and rolling-resistance, and maintenance and servicing requirements. Options for strengthening the test could include revising the wording of existing questions, increasing the number of questions included in the test, or even having a separate section of the test which deals exclusively with these issues, which candidates would need to pass.

Adding information on new alternative fuels and efficient vehicles technology to the theory test

Issues that are not yet covered fully in the theory test, or in the official source materials from which test questions are drawn,[5] include alternative fuels, choosing an efficient vehicle, and car clubs. In *Driving: the Essential Skills*, some information is already provided on recent improvements to petrol and diesel engines, cleaner petrol and diesel fuels, and LPG. In terms of fuel and CO_2 emissions savings, emerging technologies and alternative fuels such as hybrid vehicles and biofuels have the potential to achieve much more, and would be worth including in the theory test syllabus.

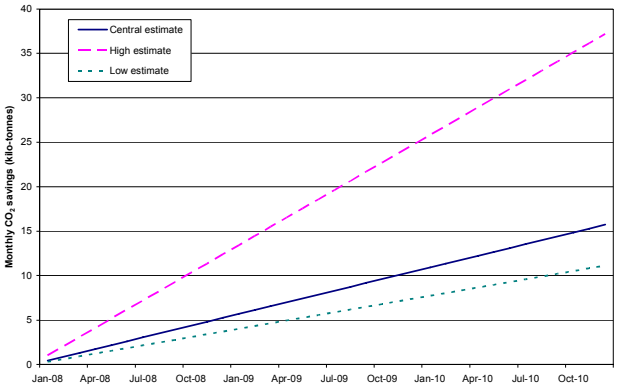
An experiment conducted in the Netherlands, as part of the Eco-Drive[6] scheme, incorporated energy-efficient driving into normal driving lessons, providing training and support to help instructors incorporate the changes. People who received the training drove 4% more efficiently shortly after passing the driving test than other new drivers, even though their speeds were identical. The Eco-Drive scheme has since been rolled out, and more recent figures reveal average efficiency improvements of 10% in practice amongst drivers who received the training.[7] Other sources[8] estimate potential efficiency gains in the region of 5 to 25% on the introduction of energy-efficient driving techniques. For example, trials conducted by the Driving Standards Agency (DSA) during 2004 showed an 8.5% improvement in fuel efficiency for drivers on a set course after two hours of training.

How much energy could be saved?

The potential fuel and CO_2 emissions savings that could result from the Quick Hit have been estimated using 'high', 'low' and 'central' scenarios. The assumptions used in the calculation were as follows:

- New drivers improve fuel efficiency by 4% in the 'low' and 'central' scenarios, and by 10% in the 'high' scenario after they had been trained and tested on energy efficient driving techniques
- The new requirements for the theory and practical driving tests come into force on 1st January 2008
- 731,000 people pass their driving test each year up to 2010[9]
- 79% of these people drive petrol cars, while 21% drive diesel cars[10]
- Average fuel consumption of diesel cars is 40 miles per gallon, and for petrol cars the figure is 30 mpg[11]
- Amount of CO_2 emitted per litre of petrol is 2.31 kg, while for diesel it is 2.68 kg[12]
- Annual distance driven per car driver is 6,582 miles under the 'high' and 'central' scenarios, or 4,659 miles under the 'low' scenario[13]

The following graph illustrates how much CO_2 could be saved per month as a result of the Quick Hit.



As the graph shows, CO_2 emissions savings would increase each month, as the number of drivers who have passed the new test increases. If the new driving test requirements came into force from the beginning of January 2008, the total CO_2 emissions avoided during 2010 as a result could be 113,000 tonnes if the low scenario were met, 160,000 tonnes under the central scenario, or as much as 378,000 tonnes if the high scenario was achieved. This last figure, equivalent to around 100,000 tonnes of carbon, would account for some 2% of the gap identified between the UK Government's target of a 20% cut in CO_2 emissions on 1990 levels by 2010 and the current expected fall of 15-18%. While the assumptions stated above may change as time progresses, for example as average mileage or fuel efficiency changes, the calculations suggest that during the first 10 years from implementation, the total CO_2 emissions avoided would be at least 2.2 million tonnes, and could be as high as 7.5 million tonnes.

These estimates only account for the savings from introducing energy-efficient driving to the practical test, due to the availability of reliable data - the benefits of informing new drivers about alternative fuels and vehicle technologies could also be significant. Also, it does not attempt to quantify the possible knock-on effect of new drivers passing on good practice and information to existing drivers amongst friends, relatives and colleagues, or the improvements undertaken by existing drivers as a result of the publicity that would be likely to accompany any changes.

The potential benefits of changing the driving test would need to be considered against the practical implications and the costs that would be entailed. The practical steps that would be required to implement the quick hit are described in further detail below. At this stage it is not possible to quantify the costs precisely, although as a useful comparison, the Eco-Drive programme introduced in the Netherlands cost in the region of 5 Euros per tonne of CO_2 emissions saved over a 10-year period.[14]

How could it be implemented, and how soon?

The Driving Standards Agency (DSA) has recognised the potential of energy efficient driving and intends to introduce new practical test requirements for car drivers at some point in the future, although details of what will be introduced and when have not yet been decided on. Following on from the trials mentioned above, work has been underway to assess how new requirements could be introduced and how they can be made effective. According to Jeff Pickering, the Assistant Chief Driving Examiner at the DSA, one of the greatest challenges will be to ensure that new drivers remember and use the good practice that they are taught.[15]

The following steps would be necessary to implement the Quick Hit:

- Finalise DSA strategy for implementing the new driving test requirements for energy efficient driving and knowledge of alternative fuels and vehicle technology, and consult the industry on the strategy
- Modify the theory test to include greater emphasis on energy-efficient driving and new information on alternative fuels and efficient vehicle technology. Information not yet covered in the official DSA source materials will also have to be updated and reissued
- Modify the practical test to include an assessment of the candidate's ability to drive efficiently
- Ensure driving examiners and driving instructors are aware of and trained in the new requirements, some of which have already been incorporated in the practical test for Approved Driving Instructors as from October 2005
- Incorporate energy-efficient driving and alternative fuels and vehicle technology into the check tests for Approved Driving Instructors
- Prepare and distribute materials for use in the instruction of learner drivers, clearly highlighting the benefits of the energy efficient driving style
- Monitor progress with implementation, and update the requirements and the associated training materials according to new developments in policy, driving practice, fuels and technology
- Deliver refresher training to driving examiners and driving instructors as required.

Based on discussions with the DSA, it could be possible for the new driving test requirements to come into force in 2008. The timing is limited by the need to revise the theory test questions, which are updated annually, and also by the need to review the official source materials.[16] The fact that training is already available for Approved Driving Instructors will enable the practical elements of the new requirements to be implemented within this timeframe.

Where can I find out more?

The following organisations and projects are able to provide more information about what the current driving test includes, and what could be incorporated to reduce CO_2 emissions and fuel consumption.

- The DSA is responsible for driving standards in the UK and sets the requirements for both the practical and theory tests (www.dsa.gov.uk).
- European projects including Ecodrive (www.ecodrive.org) and TREATISE (www.treatise.eu.com), offer a wealth of information about energy-efficient driving, alternative fuels and vehicle technology, including training materials.

[1] DTI (2006) Energy Review: The Energy Challenge, p.131.
[2] British School of Motoring (www.bsm.co.uk).
[3] Review of theory test questions related to energy efficiency and environmental impacts of driving, extracted from the DSA Car-Bike Theory Test Question Bank, by Cliff Briggs, Theory Test Unit, DSA.
[4] Wilbers, P. (1999) The New Driving Force: a new approach to promote energy-efficient purchasing and driving behaviour Ecodrive Conference, Austria, 16 - 17th September 1999.
[5] The content of the practical and theory tests have to be covered adequately in the three official DSA source texts: *The Highway Code, Driving: The Essential Skills,* and *Know Your Traffic Signs.*
[6] The Eco-Drive project, which started in 2001, was part-financed by the EU SAVE energy efficiency programme. The project explored the potential for reducing fuel consumption and CO_2 emissions through the promotion of energy efficient driving techniques. Six demonstration projects were conducted across Europe.
[7] Kroon, M. (2005) Eco-driving and Speed Limits Saving 10% - 20% Fuel in Transport. Presentation to International Energy Agency/ European Conference of Ministers of Transport workshop, Paris 2005.
[8] Carplus (www.carplus.org.uk); Energy Savings Trust (2005) Ecodriving Manual, produced as part of the EU sponsored TREATISE project (www.treatise.eu.com).
[9] In the 2004/5 financial year the Driving Standards Agency (DSA) conducted almost 1.7 million practical driving tests for car drivers in Great Britain. The overall pass rate was 43%, implying that 731,000 people passed their driving test and became newly licensed drivers during that year.
[10] This is based on the details of all cars currently licensed (2005), of which 79% were petrol fuelled and 21% diesel fuelled (DfT Transstats).
[11] Based on fuel consumption figures for 2004, also available from DfT Transstats.
[12] Based on the CO_2 content of fuel, available from Defra (2005).
[13] This is based on average annual mileage figures for main drivers and other drivers in a household, from the DfT (2004) National Travel Survey, of 7,406 miles and 2,976 miles respectively. The calculations for the 'high' and 'central' scenarios assume that the proportion of UK drivers that are the main driver or other driver in their household is the same as the proportion reflected by survey respondents (81% and 19%). For the 'low' scenario, it is assumed that all new drivers aged over 21 are main drivers, while those aged 21 or under are 'other' drivers (38% and 62% - DSA 2005).
[14] Ecodrive project (www.ecodrive.org).
[15] Jeff Pickering, Assistant Chief Driving Examiner, Technical Standards Branch, DSA (personal communication, 13th January 2006).
[16] Cliff Briggs, Theory Test Unit, DSA (personal communication, 13th January 2006).