Submission

Sustainable Development Commission

SDC Submission to
the Environmental Audit Committee inquiry on

Reducing Carbon Emissions from Transport

February 2006

1 The Sustainable Development Commission

1.1 The SDC is the UK government's independent advisory body on sustainable development issues. Climate Change and transport is a key concern for the Commission. We therefore welcome the opportunity to contribute to this Inquiry. We strongly support the emphasis on the need to reduce emissions of CO_2 from transport in the period to 2020.

2 CO_2 emissions from transport

2.1 In the 2003 Energy White Paper, the Government outlined its long-term objective to cut CO_2 emissions by 60% from 1990 levels by 2050, with significant progress by 2020. It is likely that CO_2 cuts of more than 80% by 2050 will now be required, in line with more recent scientific thinking, and it is increasingly clear that we need substantial reductions in the period 2006-2020 to put us on the right trajectory.

2.2 Transport has an important role to play in achieving reduction targets. In the transport sector, carbon accounts for 96% of greenhouse gas emissions. After electricity generation, the transport sector is the second largest source of carbon (and greenhouse gas) emissions in the UK and the only sector where emissions are predicted to be higher in 2020 than in 1990. Current and future carbon emissions for UK road, and other transport are detailed in Table 1. Carbon emissions by mode are provided in Table 2.

Table 1 Carbon emissions (MtC) by road and other transport in 2005 and projected to 2020

	2005	2010	2015	2020
Road transport	32.4	34.5	36.5	38.2
Other domestic transport	1.8	1.9	2.0	2.1

Source: Department for Transport (2005) Transport Statistics Great Britain
These figures include personal and freight transport and assume the full impact of the Climate Change Programme. Not including the impact of the CCP would result in emissions being approximately 5.6 MtC higher in 2010.

Table 2 Carbon emissions (MtC and percentage) by mode in 2003

Mode	Source Emissions (MtC)
Passenger cars	19.8 (56%)
Light duty vehicles	4.4 (13%)
Buses	1.0 (3%)
HGVs	7.2 (21%)
Mopeds and motorcycles	0.1 (-)
Railways	0.3 (1%)
Civil aircraft	0.6 (2%)
Shipping	0.9 (3%)

Source: Department for Transport (2005) Transport Statistics Great Britain

2.3 Table 2 shows emissions by mode. End user emissions, which include a share of the emissions from the combustion of fossil fuels at power stations and other fuel processing industries are typically around 10% higher except for rail travel which increases to 1.5 MtC on this basis. Aviation and shipping figures in Table 2 refer to domestic travel, in line with the UNFCCC reporting requirements. If international travel is included emissions are much higher - civil aircraft produces 10.6 MtC and shipping 6.6 MtC.

2.4 We respond here to the two strategic issues identified by the Committee:

What realistically the DfT could achieve by 2010 and 2020 in terms of reducing transport-related carbon emission, the role that demand management should play in doing so and the specific steps the department should now take to reduce road transport and carbon emissions over the next decade?

2.5 We consider the two periods of time together because most of the steps proposed for 2010-2020 require preparatory action by 2010 and separate personal transport (private and public transport) from freight. We do not address shipping, but suggest that this is an area that needs further research and action. Given the remit of the Inquiry we do not consider aviation here, but note our concerns in the covering letter.

3 What realistically could the DfT achieve by 2010 and 2020 in terms of reducing transport-related carbon emissions, what role should demand management play in doing so and what specific steps should the department now take to reduce road transport carbon emissions and congestion over the next decade?

PERSONAL TRANSPORT - PRIVATE

3.1 Carbon emissions from private vehicles can be reduced by:

1. using more efficient, lower carbon vehicles
2. using lower carbon fuels
3. using existing vehicles more efficiently
4. reducing the number and length of trips
5. using alternative modes

3.2 In the Sustainable Development Commission response to the Climate Change Programme Review we outlined how the government could secure savings of up to 3.5 MtC per annum from the personal transport sector, which we discuss below alongside the findings of more recent studies.

Using more efficient, lower carbon vehicles

Changes in Vehicle Excise Duty

3.3 At present, improvements in vehicle efficiency have been offset by consumers purchasing larger, less fuel efficient vehicles with increased features such as air conditioning that raise fuel use. Graduated Vehicle Excise Duty bands were introduced by Government in 2001 to encourage people to purchase more fuel efficient vehicles. However, the maximum differential between each band is £15 and therefore this has had limited impact on consumer purchasing decisions. The SDC recommended a £300 differential between each band (following research by MORI), and the introduction of a new higher band of £1800 a year for vehicles which emit more than 221g CO_2/km. With vehicles that emit less than 100g CO_2/km zero rated, we believe that this policy would dramatically improve the affordability and the market demand for highly efficient vehicles such as hybrid cars.

3.4 Our assessment is that the introduction of these measures would result in savings of 0.5 MtC per annum.

3.5 We proposed that this policy should be brought into effect in 2008 and the policy should be announced as soon as possible, preferably as part of the revised Climate Change Programme Review.

3.6 This policy measure would also help contribute to achieving the Government's Powering Future Vehicle Target for 10% of new vehicle sales to have emissions of 100g CO_2/km or lower by 2012. The market share today is only 0.03%.

Voluntary agreements on emission reductions

3.7 Voluntary agreements on transport emissions reductions, between car manufacturers and the European Commission, are operational until 2008/2009. The SDC recommends that it is important to set post-2008 targets now, in order to provide a clear signal of intent to accelerate the development and implementation of low-carbon technologies

Using lower carbon fuels

Increased use of biofuels

3.8 Biofuels can and should play an increasingly important role in the UK fuel mix for transport. They can offer reductions in greenhouse gas emissions, as well as increased opportunities for energy security, and rural employment. If biofuels contribute 5% of fuels in 2010 Government indicates that carbon savings of around 1 MtC could be achieved.

3.9 The SDC has examined the impacts of increased biofuel production in relation to wider sustainable development issues. We particularly recommend the use of agricultural waste products including crop and forest residues and animal wastes as the main source for biofuels. Using primary crops for biofuel production leads to difficulties in validating greenhouse gas emissions over the whole life cycle of the crop, and in assessing the potential impacts in the UK and overseas from loss of biodiversity and water stress from land use and crop management change, and social impacts particularly overseas. Using waste products as a feedstock for biofuels effectively avoids any of these negative impacts and has the added advantage of productively managing a waste stream.

3.10 Whatever the biofuel source, it is essential that bio-fuels are accredited, to validate their full life-cycle carbon savings and to ensure that they are produced sustainably.

Using existing vehicles more efficiently

Speed limits

3.11 We recommend that the DfT examine the role that changes in speed limits could make to reducing carbon emissions. France enforced strict speed limits on main motorways in 2004 and succeeded in reducing carbon emissions by 19% and accidents by 30%. Our assessment is that around 1.5 MtC could be saved per year through speed control measures.

3.12 In advance of these changes a national awareness campaign could inform people about the financial costs of speeding (economic impact of delays due to speed-related accidents, costs to the NHS), the personal and social costs of injuries and deaths, and the trivial amount of time saved compared with maintaining a steady safe speed.

3.13 Assessments suggest that 'eco-driving' could result in emissions savings of around 20% after initial training and about 5% in the longer term[1]. This includes shifting into a higher gear as soon as possible and making sure cars are not carrying unnecessary excess weight for example empty roof-racks and boxes.

Reducing the number and length of trips

3.14 Improvements in land use planning could result in reductions in traffic of up to 2% by 2010[2]. DOE/DOT[3] suggested that land use planning policies in combination with transport measures could reduce transport emissions by 16% over a 20 year period.

3.15 Current typical housing densities of 30-50 dwellings per hectare or less will reinforce the dependence on travel by

[1] Eco-driving (2001) http://www.ecodrive.org/pdf/broschure.pdf

[2] WS Atkins and Partners (1999) Assessing the Effects of Integrated Transport White Paper Policies on National Traffic: Final Report. WS Atkins and Partners, Epsom.

[3] Department of the Environment, Department of Transport (1993) Reducing Transport Emissions Through Planning. HMSO

private car. Housing densities in proposed growth areas and other new developments need to be at least 50 dwellings per hectare to justify the provision of comprehensive services including shops, healthcare, chemists, good public transport links and improved walking and cycling facilities. Examination of some developments in the housing market renewal areas reveals the disconnect between improving the housing standards, encouraging regeneration of the area, but the failure to embed sustainable transport practices into the community, as the provision of good bus services, and attractive and safe cycle routes is not developed at the start of the regeneration process. This leaves many new residents with the only option to buy a car to get to work, school or the nearest shops and services.

Using alternative modes – behaviour change measures

3.16 Technology is often viewed as the primary solution to reducing carbon emissions from transport[4,5]. However, both behavioural and technological change are necessary to reduce transport emissions, because:

- measures to influence behavioural change can be implemented quite quickly;
- technological gains may not be as high as anticipated; and,
- behavioural change may be required to secure the potential savings from technological change, for example to turn fuel efficiency into fuel conservation, as the "rebound" effect of increased travel can be the result of improved efficiency gains.

3.17 Behavioural change measures include green travel plans, school travel plans, car clubs, information about public transport, and "lock in" measures to discourage car use (see below). These measures, could together result in an 11% reduction in national traffic levels over a ten year period if introduced under a 'high intensity scenario'[6]. With political will these reductions could be achieved more quickly and could save 0.5 MtC per annum.

3.18 Traffic reductions will free up road space, which could then again encourage more car use. It is therefore essential that demand management measures are introduced that 'lock in' the traffic reduction and carbon savings associated with behavioural change measures. Demand management measures include:

- road space re-allocation in favour of public transport, walking and cycling;
- co-ordinated parking restraints between local councils to ensure a consistent approach discouraging vehicle use;
- congestion charging to discourage driving in towns;
- a national road pricing scheme that combines both congestion and distance charging.

Road pricing

3.19 The SDC supports the introduction of a national road pricing scheme to help address the social and environmental costs of transport. We are concerned, however, that road pricing could lead to increased emissions if it is based only on congestion or if it replaces incentives to

[4] Department of Trade and Industry (2002) Energy White Paper: Our Energy Future – Creating a Low Carbon Economy

[5] UK Government (2005) Sustainable Development Strategy

[6] Cairns S., Sloman L., Newsome C., Anable J., Kirkbride A., and Goodwin P., (2004) Smarter Choices – Changing the Way we Travel

buy more fuel efficient vehicles (e.g. fuel duty in a revenue-neutral scheme). If based only on congestion, cheaper rural motoring and off-peak travel could result in increases in traffic volumes, and if incentives for more fuel efficient vehicles are removed then average vehicle emissions are likely to increase. We therefore recommend that from the outset the scheme design must take account the need to reduce carbon emissions as well as congestion, with charge bands graded to reflect carbon impacts.

A National Traffic Reduction Strategy

3.20 A national strategy on traffic reduction, with targets, would be key for a co-ordinated approach to behavioural change and the associated demand management measures. The two strands of the strategy could be mutually reinforcing if revenue raised from demand management measures were used to fund behavioural change.

3.21 The congestion aspect of the transport innovation fund and the three sustainable travel towns (Darlington, Peterborough and Worcester) are potentially important exemplars which demonstrate the merits of behavioural change and demand management measures, but mainstream funding is now necessary.

Comprehensive Spending Review

3.22 The forthcoming Comprehensive Spending Review is an opportunity to reallocate more funds to behavioural change and demand management measures from projects that would reinforce dependence on travel by private car.

Modal shift from car to public transport

3.23 Modal shift from car to public transport can result in carbon savings. However, the level of saving depends on vehicle occupancy, vehicle efficiency and assumptions about the diversion factor from cars. Assumptions may also need to be made about the proportion of car journeys that can be replaced by public transport. The timescale over which the savings are calculated is also important: in some cases there may be a delay of several years between investment in public transport, increased rates of use and modal shift. We suggest that this is an area where further analysis is needed, in particular to assess the impact that improved public transport may have in influencing people's transport choices at different stages of their life. For example, moving house or job is often linked to new transport choices, and younger and older people tend to rely more on a pedestrian-scale environment and public transport. Improvements in public transport may encourage people not to purchase a car, not to renew it, or to give it up.

Personal Transport - public

3.24 Public transport makes a small contribution to overall carbon emissions from transport. Buses are estimated to produce around 1.0 MtC and rail 1.5 MtC each year[7] (end user emissions).

3.25 Nevertheless reductions can be achieved. Diesel electric hybrid buses can achieve carbon reductions and fuel savings of 33% per vehicle kilometre. If all buses were hybrids then about 0.33 MtC could be saved each year.

Reform of Bus Duty Rebates

3.26 Bus companies that operate local and regional registered bus services currently receive a grant from the Department for Transport to reimburse 80% of the excise

[7] Department for Transport (2005) Transport Statistics Great Britain

duty paid on the fuel used in operating those services. This subsidy effectively removes the incentive for operators to purchase more fuel efficient, lower carbon vehicles. A review of bus subsidies was undertaken in 2002, but no changes were made. We recommend that the current subsidy is replaced with a per passenger subsidy with a support mechanism to enable concessionary services to be cross-subsidised from the highly used bus services.

3.27 Carbon emissions from rail could be reduced through increased electrification. Electric trains offer substantial reductions in carbon emissions compared with diesel trains. The extent of carbon savings will depend on the proportion of diesel trains replaced and the proportion of low-carbon sources of electricity in the UK grid mix. The DfT should explore the use of its franchise agreements with train operators as a method for increasing electrification.

FREIGHT

3.28 Freight accounts for around 35% of transport emissions and this figure is expected to increase in the future. Therefore, the impact of the Sustainable Distribution Strategy on carbon emissions must be carefully monitored to ensure savings are achieved. This strategy with associated grants and advice is expected to achieve savings in the region of 0.4 MtC. Further carbon saving measures must also be introduced.

3.29 One method would be to further increase the proportion of freight carried by rail and the waterways. Investment in developing the capacity of the rail network to accommodate longer and wider trains, and to improve freight handling facilities will help reduce the costs of rail and ease potential problems of competition with passenger services[8].

3.30 For further savings we outline below the findings from a study by the Bartlett School of Planning, and Halcrow[9]. Although the study considers a 2030 timescale, the results may be of use to this Inquiry.

3.31 The use of hybrid and biofuels technologies could save between:

- 1.8 MtC (assumes hybrids reduce freight emissions by 25% and 20% biofuel penetration) and
- 9.1 MtC per annum (assumes hybrids reduce freight emissions by 50% and 50% biofuel penetration)

3.32 Load consolidation and reduced transport content of products ('freight dematerialisation') could achieve a 19% reduction in billion tonne kilometres and save 2.5 MtC per annum through measures such as introducing whole life cycle product responsibility by manufacturers.

3.33 Reducing the distances in the flow of goods, more localised production and consumption (so-called 'freight subsidiarity'), could save up to 0.7 MtC a year through measures including:

- the promotion of 'regional' consumer markets,
- by improving public awareness and information, particularly on the carbon content of goods; and,

[8] Freight on Rail. Goods without the Bads: A guide to the planning and developing a rail freight strategy

[9] The Bartlett School of Planning and Halcrow Group Ltd (2006) Visioning and Backcasting for UK Transport Policy (VIBAT) Stage 3 Report Policy Packaging and Pathways

- differentiated road pricing and increases in real road transport costs.

Submission of memorandum – contact details

Alison Pridmore
Sustainable Development Commission
Ground Floor, Ergon House
Horseferry road,
London
SW1P 2Al
0207 238 4987
Alison.Pridmore@sd-commission.org.uk