

Welsh Assembly Government Memorandum: Transport and Carbon Reduction

Introduction

1. The transport network supports the economy by linking people to jobs, delivering products to markets and supporting domestic and international trade. It also helps to promote social inclusion by providing people with access to key services and facilities.
2. Since the 1950s there has been a steady growth in the demand for travel, with both people and goods moving ever-greater distances. This reflects the growth in the economy as well as the trend towards increasing globalisation. We have become highly dependent on the private car, with increasing urban congestion, concerns about accessibility in the more remote areas and an increasing awareness of the environmental impacts of transport.
3. The challenge is to develop the transport network in a way that supports economic growth and promotes social inclusion, while at the same time ensuring that transport plays its full part in reducing greenhouse gas emissions as well as minimising wider environmental impacts.

The environmental impacts of transport

4. Most of the demand for travel is met by vehicles, trains, aircraft and ships with engines which burn fossil fuels such as petrol, diesel or gas. These engines emit exhaust fumes containing a range of harmful substances. Most attention focuses on carbon dioxide (CO₂) as a greenhouse gas, although other substances such as nitrogen oxides (NO_x) can have a significant adverse impact on air quality.
5. In addition to direct emissions from engines, transport contributes to climate change in other ways. It generates 'upstream' CO₂ emissions, for example, from the refineries that produce transport fuel. A further impact arises from 'radiative forcing', as emissions from aircraft at altitude have a greater warming effect than the corresponding emissions at ground level. While the science is currently uncertain, the climate change impact of aviation emissions is thought to be between 1.9 and 4 times greater than the CO₂ impacts alone.

Trends in transport emissions

6. In Wales, transport accounts for around 15 per cent of domestic CO₂ emissions by source. This is significantly lower than the corresponding figure for England (25 per cent), although this is primarily a reflection of the different

structure of the Welsh economy (and the relative importance of the manufacturing and energy industries in particular). On a per capita basis, CO₂ emissions from transport are broadly the same in Wales as in the rest of the UK.

7. The table below shows the relative importance of the different transport modes in terms of carbon emissions for domestic transport in the UK. Road transport is by far the most significant producer of emissions in the transport sector, accounting for more than 90 per cent of total transport emissions. Cars make up over half of total emissions, with lorries, vans and buses accounting for nearly 40 per cent.

UK transport sector carbon emissions by source 2005: Analysis by mode (excluding international aviation and shipping)	
Mode	Percentage
Cars	54
Lorries	22
Vans	13
Buses	3
Railways	2
Domestic air	2
Domestic shipping	3
Total	100

Source: Department for the Environment, Food and Rural Affairs. Figures exclude international aviation and shipping.

8. There are variations in the relative efficiency of the various modes in terms of carbon emissions. While it is possible to produce comparative figures in terms of emissions per passenger kilometre, as set out below, the figures do need to be interpreted cautiously as they are influenced by a range of factors such as load factors, type of vehicles and time of travel. The aviation figures do not reflect the impact of 'radiative forcing' as mentioned above.

CO₂ emissions by mode	
Mode	Grams of CO₂ per pax km
Car	132
Buses	89
National rail	60
Aviation (short-haul)	130
Aviation (long-haul)	106

Source: Department for Transport

9. In terms of trends over time, transport emissions have grown steadily in recent decades, reflecting the growth in transport demand noted above. There is however a more mixed picture by mode. Emissions from cars have stabilised since 1990, despite the underlying growth in traffic, mainly reflecting improved fuel efficiency. Emissions from lorries and vans have grown significantly since 1990, whilst the sharpest increase has been in aviation emissions.

The scope for reducing transport emissions

10. The headline conclusion of the independent Stern Review¹, published in October 2006, was that developed countries must cut CO₂ emissions by at least 60 per cent by 2050, but that this could be achieved at a material, but manageable, global cost of 1 per cent of GDP. Stern emphasised the importance of urgent and cost-effective action on climate change across all sectors of the economy, noting that:

“Transport is one of the more expensive sectors to cut emissions from because the low carbon technologies tend to be expensive and the welfare costs of reducing demand for travel are high. Transport is also expected to be one of the fastest growing sectors in the future. For these two reasons, studies tend to find that transport will be among the last sectors to bring its emissions down below current levels”.

11. Stern’s view was that in the short-term, cost-effective savings in transport emissions were likely to come from three areas:

- improvements in the fuel-efficiency of oil-based transport vehicles;
- behavioural change, for example, switching to more environmentally-friendly forms of transport; and
- increased use of biofuels.

12. For the longer-term, the analysis undertaken for the UK Government’s Energy White Paper² suggests that reductions in transport emissions of between 40 and 60 per cent are possible by 2050. Other reports, such as the WWF’s One Planet Wales³, suggest that even-greater reductions of 75 per cent are required. In this context, the recent King Review of low-carbon cars⁴ has concluded that reductions of the order of 80 to 90 per cent are possible for road transport. However, this implies the almost complete ‘decarbonisation’ of road transport, which will require the development of low carbon transport technologies (for example, electric vehicles with novel batteries charged by zero-carbon electricity, or hydrogen powered vehicles using hydrogen generated in a low carbon way). Stern has pointed out the considerable uncertainties about how quickly the cost of this low carbon technology might fall.

Targets to reduce greenhouse gas emissions

13. The Assembly Government is committed to achieving annual carbon reduction-equivalent reductions of 3 per cent per annum by 2011 in areas of

¹ Stern Review: The economics of climate change, prepared for H M Treasury, October 2006

² Meeting the Energy Challenge: A White Paper on Energy (Cm 7124), May 2007

³ One Planet Wales, Transforming Wales for a prosperous future with our fair share of the Earth’s resources, WWF, Report summary, October 2007

⁴ The King Review of low-carbon cars, Part 1: The potential for CO₂ reduction, prepared for H M Treasury, October 2007

devolved competence. This includes a specific sectoral target for transport, as well as the residential and public sectors. These targets are being derived through an open discussion with partners, with a view to securing the overall levels of carbon reduction in the most cost-effective way.

14. The Assembly Government is also committed to contributing towards the wider UK Government goals on greenhouse gas emissions. The Climate Change Bill, which is currently before the House of Lords, will provide a long-term framework to cut total UK domestic CO₂ emissions by 26 to 34 per cent by 2020, and by 60 per cent by 2050. It will also establish five yearly 'carbon budgets', starting with the period 2008 - 2012, and the Committee on Climate Change, which will be established under the Bill, will advise of the level for the first three budget periods in 2008. The UK Government has also given a commitment to ask the Committee on Climate Change to advise on whether the 60 per cent target for 2050 should be revised, following the consultation and pre-legislative scrutiny on the Bill where there was support for an 80 per cent target.

15. Work is now in hand to draw together the analysis required to develop the One Wales targets for emissions reduction and the programme of action to deliver them. The contribution that transport will need to make will be a key part of this assessment. As part of this process, the Assembly Government will be seeking expert advice from the Committee on Climate Change, which is responsible to the Secretary of State and all three devolved administrations.

Policies to reduce transport emissions

16. The need to address climate change and reduce transport emissions is already being built into the Assembly Government's transport policies and will be at the heart of the forthcoming Wales Transport Strategy⁵. The Strategy, the final version of which will be published early next year, adopts an outcome-based approach in order to maximise the contribution of transport right across the economic, social and environmental agenda. It will be implemented through a National Transport Plan, setting out detailed policies and programmes over different timeframes, as well as Regional Transport Plans prepared by the regional transport consortia.

17. The general approach in the Strategy will be to encourage travel by less carbon-intensive modes and to improve the carbon-efficiency of all modes. In the short-term, cost-effective savings are likely to come from policies focused on securing behavioural change. This includes a range of policies to make public transport – both bus and rail – more attractive and to encourage a switch from the private car. In addition, a range of measures are being taken forward under the banner of 'Smarter Choices', with greater use of workplace and school travel planning, car sharing schemes and enhanced provision for walking and cycling.

⁵ Wales Transport Strategy – Connecting Wales, A consultation document, Welsh Assembly Government, July 2006

A Sustainable Travel Towns initiative is being developed, to enable a number of towns to become exemplars in terms of sustainable travel. This approach will then be rolled-out across Wales. The 'Act on CO₂' multi-media campaign is intended to raise awareness of environmental issues, encourage eco-friendly driving techniques and influence car purchasing behaviour.

18. In addition, under the umbrella of the Wales Transport Strategy, a freight strategy is being developed which is designed to encourage a switch of freight traffic from road to rail and short-sea shipping. A freight best practice programme has been introduced which will offer road freight operators free advice aimed at reducing emissions and help to improve the operational efficiency of their businesses.

19. For the longer-term, the Wales Transport Strategy emphasises the need for the Assembly Government to continue to work closely with the UK Government to take forward the carbon reduction agenda. This is essential as many of the policy levers which can impact on transport emissions are controlled by the UK Government or the European Commission, or may even require broader international agreement. This includes a range of measures such as:

- the development of market mechanisms, including fiscal measures such as fuel duty, Vehicle Excise Duty and emissions trading schemes;
- regulatory measures, such as the introduction of the Renewable Transport Fuels Obligation (which will require transport fuel suppliers to ensure that a proportion of their sales are from renewable sources) and legislation on new car fuel efficiency; and.
- support for the development of new low carbon transport technologies.

20. In this context, the UK Government has recently published a consultation document⁶ containing a commitment to consider the full range of options for putting transport onto a less carbon-intensive path and to examine potential cost-effective emissions reduction pathways for different types of journeys and different transport modes. The Assembly Government will liaise closely with the UK Government on this work.

Summary

21. The Assembly Government believes that transport must play its full part in combating climate change and believes that this can be done in a way that is compatible with developing the network to support economic growth and promote social inclusion.

22. Stern has noted that transport is one of the more expensive sectors from which to cut emissions and that it will be among the last sectors to bring its emissions below current levels. There is however a need for immediate action

⁶ Towards a Sustainable Transport System: Supporting Economic Growth in a Low Carbon World, Department for Transport, October 2007

and in the short-term cost-effective savings will come from measures focused on securing behavioural change. For the longer-term, the Assembly Government will continue to work closely with partners to explore the full range of options for putting transport onto a less carbon-intensive path. This will include drawing on the expertise of the Committee on Climate Change to establish where the most cost-effective savings can be made.

23. The Assembly Government will be taking the carbon reduction agenda forward through the forthcoming Wales Transport Strategy and the related National and Regional Transport Plans.

Welsh Assembly Government
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