

# Low Carbon Transport: A Greener Future



A Carbon Reduction Strategy for Transport  
July 2009



# Department for Transport

## Low Carbon Transport: A Greener Future

A Carbon Reduction Strategy for Transport

Presented to Parliament by the  
Secretary of State for Transport  
by command of Her Majesty

July 2009

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*This strategy is intended to enable the UK to meet the requirements of the carbon budgets set under the Climate Change Act 2008. Implementation of the strategy will be taken forward in a way that recognises and respects the policy responsibilities and powers of the devolved administrations in Northern Ireland, Scotland and Wales respectively.*

*The regulation of aviation and air transport is reserved, as is the regulation of merchant shipping. With certain exceptions, such as safety, rail policy is a devolved matter in Scotland; the Welsh Assembly Government has powers in relation to Welsh and cross-border rail services. The provision of trunk roads and motorways in Northern Ireland, Scotland and Wales is devolved along with the management of their maintenance and improvement.*

*With certain exceptions road traffic regulation is largely reserved. Some parts of policy, such as road safety education are devolved matters for Northern Ireland, Scotland and Wales.*

#### **Photographic acknowledgements**

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# Foreword



Putting Britain on the path to a low carbon future is one of my key tasks as Transport Secretary. We all know that good transport systems and services are fundamental to our economy and our quality of life. We have also long recognised that transport has adverse impacts on the environment. Avoiding dangerous climate change means we must act, both in the UK and internationally, to reduce greenhouse gas emissions from transport.

This new strategy explains how we will make this happen.

Building a greener future means that low carbon travel must be a genuine, viable and attractive option for businesses and ordinary citizens. It does not mean government dictating which particular mode of travel people should use. Instead, what I want is to widen the options so that it is easier and a natural part of life for people – and businesses – to go for the low carbon option. Everyone can do something.

We have already put in place measures to support this. In road transport we've agreed a framework with our European partners for reducing carbon dioxide emissions from new cars. We are supporting the development, manufacture and purchase of ultra-low carbon cars, vans, and buses. We are promoting sustainable biofuels and are working to reduce emissions from road freight. We are helping drivers make better-informed decisions about the carbon impact of the vehicles they purchase.

We are pursuing an agenda to reduce the carbon impact of the railways. As the Prime Minister announced on 29 June we are preparing for a major programme of rail electrification. Even more radically, and following on from the successful completion of High Speed One from London to the Channel Tunnel, we are reviewing the case for a north-south high speed rail line with the establishment of the High Speed Two Company.

In aviation and shipping we are pushing the operators and manufacturers to bring forward ambitious technological improvements that will increase fuel efficiency and reduce environmental impacts. The Government is also pressing for international aviation and international shipping to be included in any new global deal agreed at the Copenhagen Climate Conference in December 2009. We are looking for operational efficiencies too, for example through better air traffic control.

I also want to promote more active modes of travel. Cycling has enormous growth potential as a healthy, convenient and green transport option. That is why the Government is promoting cycling demonstration towns and cities across the country. More than 60 per cent of the population live within a fifteen minute bike ride of a railway station, so cycling can also provide a vital link to our public transport system and we have recently announced a new £5 million programme to improve cycling storage facilities at up to ten major railway stations nationwide.

If more people make more use of public transport, there could be less congestion on our roads and less pollution in our atmosphere. We are therefore determined to make public transport a far more attractive choice.

A major reduction in transport emissions does not mean reduced quality of life. Our new strategy is a signal of our determination to build a low carbon future – it is a blueprint for delivering the change needed to make that future a reality.

A handwritten signature in blue ink, reading "Andrew Adonis", with a horizontal flourish underneath.

**Lord Andrew Adonis**

# Executive summary

## The challenge of climate change

Climate change is already happening and we need to act collectively and decisively if we are to avoid the worst impacts it could bring. The scientific consensus tells us that by 2050, we must strive to reduce global greenhouse gas emissions by at least 50 per cent.

A developed country like the UK must go even further. This is why we have taken ground-breaking steps through our Climate Change Act, setting a target to reduce UK greenhouse gas emissions by at least 80 per cent by 2050. Under the Act, the Government has also set five-yearly carbon budgets for the UK economy out to 2022.

Climate change is an international, not just a domestic issue. The UK's legislative framework complements the package of targets agreed with our partners in Europe aimed at cutting greenhouse gas emissions and delivering more energy from renewable sources across the EU by 2020. And looking wider at a global level, we need to agree to significant further cuts in emissions at the UN talks in Copenhagen at the end of this year. Securing international agreement to reducing carbon dioxide (CO<sub>2</sub>) emissions from aviation and shipping is a vital part of this deal.

## The opportunities for transport

With greenhouse gas emissions from transport representing 21 per cent of total UK domestic emissions, decarbonising transport must be part of the solution. This will be a major change, but moving to a low carbon economy and transport system also presents huge opportunities; not just for climate change but for our prosperity, health, and the wider environment.

Transport underpins our quality of life and economic prospects and we want to give people and business more low carbon choices about when, where and how to travel, or to transport goods. If we get this right, by 2050 we can expect to see a fundamentally different transport system in our country. Road and rail transport will be largely decarbonised. The technical challenges are greater for aviation and shipping, but these modes too will have seen a transformative improvement in efficiency.

In bringing forward *Low Carbon Transport: A Greener Future*, a key component of *The UK Low Carbon Transition Plan*, we acknowledge the scale of the challenge for our sector, and set a course towards a low carbon transport system of the future. We set out the actions we are taking to deliver cuts in emissions in line with meeting our obligations under carbon budgets to 2022. And we outline how we are putting the building blocks in place for longer-term change for the period to 2050.

## Supporting a shift to new technologies and fuels

We aim to harness the full potential of low carbon technology across all transport modes.

On the roads, vehicles will be vastly more fuel-efficient by 2022. This will primarily be delivered through advances in the efficiency of the internal combustion engine. Alongside this, new ultra-low emission vehicles will have made their transition onto the mass-market.

### **Cars**

The EU's New Car CO<sub>2</sub> Regulation, which we agreed in 2008, establishes a clear, long-term framework for action by industry to develop lower emitting vehicles, whilst respecting the diversity and competitiveness of the car market across Europe.

Recognising that Government has an important role leading by example in the take up of such technologies, we have set targets for central government departments and their agencies to procure new cars that average 130gCO<sub>2</sub>/km by 2011 and will set a new target later this year.

We are committed to making the UK a world leader in research, development, demonstration and commercialisation of ultra-low carbon vehicle technology. For example, over the next eighteen months around 340 new-tech vehicles will be demonstrated on the UK's roads through the Technology Strategy Board's ultra-low carbon vehicle competition.

We are also committed to creating a more favourable market both for consumers and industry as ultra-low emission cars become available in the coming years. We will be providing help worth in the region of £2,000 to £5,000 towards reducing their price. In addition, we will be providing up to £30 million to consortia of cities and companies so that we can start building a 'core' of electric car cities.

### **Vans**

With vans representing the fastest growing sector of motor vehicles usage, as part of this strategy we are announcing support for an ambitious performance framework for CO<sub>2</sub> reduction from vans throughout the EU. This represents a significant opportunity for emissions savings out to 2020.

### **Road freight**

We aim to determine the best incentives – regulation, support for investment or best practice – to help industry achieve significant reductions in emissions from HGV operations. We will be informed by a study, published alongside this strategy, of the carbon emissions and savings that can be achieved from a number of HGV technologies. We will also contribute actively to wider discussions within the EU around CO<sub>2</sub> emissions from complete HGVs.

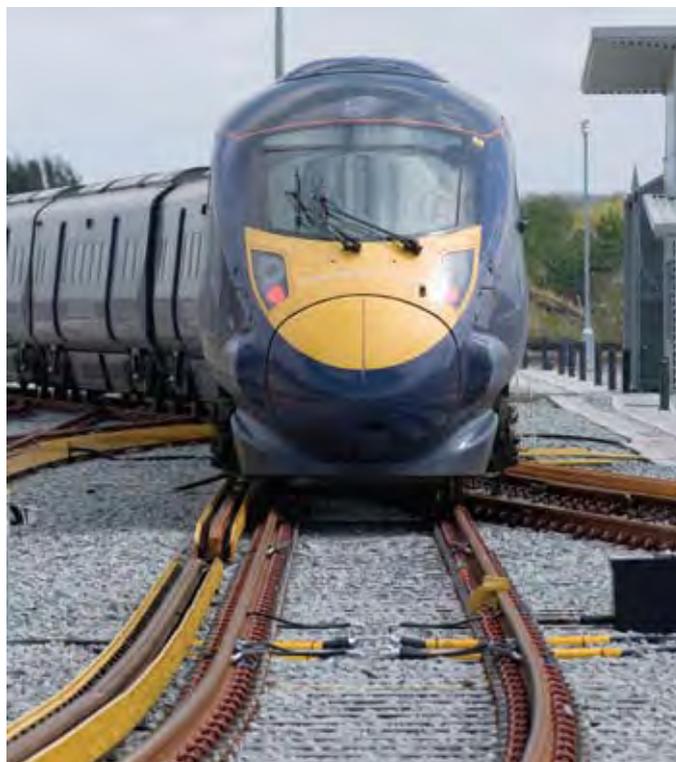
## Buses

We want lower emission buses to play a growing role in our transport system. Our financial support for the bus industry is already being revised to further incentivise technological change through modifications to the Bus Service Operators Grant. But we also want to go one step further, particularly in the current economic climate where funding for investments is difficult to source. We have announced a scheme to provide grants of up to £30 million over 2009/10 and 2010/11 to encourage the uptake of low emission bus technology.

## Rail

Our aim is for improved energy efficiency in rail operations and we are supporting industry initiatives to deliver this. There is also a good case for electrifying more of the rail network. Electric trains offer better environmental performance than diesel equivalents and can also increase capacity and reliability, as well as being cheaper to buy, maintain and operate.

We have undertaken work to look at this case more closely and will shortly confirm our plans for a major programme of electrification.



## Aviation

We are taking action in a number of areas to encourage and promote the uptake of more fuel-efficient aircraft technology.

We continue to push for international action to manage aviation emissions, and we are calling for agreement at Copenhagen to a global sectoral target for aviation, as part of a wider global deal on emissions. We are working for tougher environmental standards for new aircraft, and the UK has led discussions to develop an international standard for aircraft fuel efficiency. Through our pioneering target to reduce emissions from UK aviation to below 2005 levels by 2050 we have set a challenge to the aviation industry to innovate and adopt better fuel efficiency.

## **Shipping**

As with aviation, we are looking to the shipping industry to exploit the full potential of technology to improve fuel efficiency and reduce emissions. We will continue to work within the International Maritime Organization (IMO) on technical and operational measures to reduce CO<sub>2</sub> emissions from ships. And we will press for further international action to address emissions from shipping through the EU, IMO and UN Framework Convention on Climate Change.

## **Sustainable biofuels**

Promoting the use of sustainable biofuels is an important part of our strategy in the development of a low carbon transport system.

We are pursuing this through regulation – with the Renewable Transport Fuel Obligation in the UK and through the Renewable Energy and Fuel Quality Directives in the EU. Through these instruments, we aim to guarantee likely demand and provide certainty to industry, as well as preventing unsustainable biofuels from being produced and consumed, through the application of minimum sustainability standards. We will set out our strategy for meeting our biofuels targets in a National Action Plan by June 2010.

We are also supporting research into new biofuels in the UK. This will feed into efforts by the European Commission to understand – and, if appropriate, create a methodology to account for – indirect land-use change. We believe that this is important for securing long-term investor certainty in the biofuels industry.

## **Promoting lower carbon choices**

Technology measures are important in reducing transport emissions, but they are not enough on their own. We also need to think about the choices that we, as individuals and businesses, make on a daily basis about when, where and how to travel and transport goods.

### **Providing lower carbon public transport**

Our aim is to make public transport an accessible, attractive, low carbon and easy-to-use option for individuals and business. We will continue to provide substantial financial support to the rail and bus sectors.

Rail is an excellent lower carbon option for an increasing number of travellers. Passenger numbers have grown by 50 per cent in the last ten years. Further growth is expected, with potentially twice as many passengers using the railway over the next 30 years. Government investment and support for the railways will total £15 billion from 2009 to 2014.

Over the last 10 years, bus use in England has grown by more than 17 per cent and investment in bus services has more than doubled to £2.5 billion a year. This

includes the action we have taken to offer free travel during off-peak hours to older and disabled people through the England-wide mandatory bus concession.

### **Promoting the integration of transport modes**

Better coordination and integration of different services will improve the attractiveness and convenience of public transport. For example, we are keen to promote the use of smart ticketing which allows passengers to move seamlessly between different modes. For this reason we will consult this summer on a smart and integrated ticketing strategy for England.

In addition to smart ticketing, improving interchange between cycling and other forms of travel is also important. While some 60 per cent of the population lives within a quarter of an hour cycle ride of a railway station, only 2 per cent of journeys to and from stations are made by bike. There is a huge opportunity here, particularly in providing an environmentally friendly option for travel to work, but facilities at stations must improve and cater for this market.

We have made a start by the recent announcement of a new £5 million programme to improve cycle storage at up to ten major railway stations nationwide. Cycling England have also agreed to fund a £3 million programme to improve bike and rail integration through the Cycle Rail Task Force set up by the Department.

### **Promoting other sustainable modes**

Cycling is a viable alternative to car journeys for many short trips. As well as reducing emissions, cycling can bring additional benefits for health, reduced congestion on our roads and improved local air quality, making our towns and cities more pleasant places to live. We are providing investment and support to 18 Cycling Demonstration Towns and Cities across England.



Our Sustainable Travel Towns programme has pioneered an approach that includes a combination of travel planning, improved information and marketing, as well as organising and providing new travel services. Following the success of this programme, in May 2009 we announced that large urban areas across England are being given the chance to bid to become the country's first Sustainable Travel City.

We are also committed to developing a National Cycle Plan to further promote cycling as a mainstream form of personal transport. We will complement this with a new active transport strategy, laying out plans to encourage low carbon transport options that also promote personal health and wellbeing.

### **Further work with partners in regions and local authorities**

Local authorities and regions have considerable influence over the way we travel, through direct delivery of transport services as well as through their decisions on strategic planning, and on the locations of business and homes.

We are responding to regional and local partners who have told us that, in order to bring forward sustainable transport schemes, they need more tools, guidance and information to assist them.

We will also emphasise the importance of carbon reduction as well as delivering on other transport goals, in guidance and performance frameworks for local and regional partners. For example, this summer we will finalise guidance for local authorities on the development of Local Transport Plans. And as guidance from the Department forms part of a much wider picture, we would like to see action to reduce carbon emissions being further prioritised in the next round of Local Area Agreements, expected to be in place by April 2011.

As part of our work on longer-term strategy, we are inviting regions to identify their transport challenges and priorities for responding to them. This will provide an important opportunity for regions to identify their carbon reduction challenges and potential solutions.

### **Promoting change through better information**

Public transport may not always be as convenient as the car, and for other journeys walking and cycling will sometimes be impractical. Our aim is to ensure that people with access to a car have better information on more efficient use. For example, the ACT ON CO<sub>2</sub> campaign promotes the steps drivers can take to buy and run their car in a way that saves fuel, money and CO<sub>2</sub>. We are also extending the reach of this programme to used cars and are providing better information to consumers on vans.

We are promoting eco-driving techniques to new and existing drivers by integrating eco-driving into the new driving test and working with the Energy Saving Trust to promote eco-driving techniques to existing drivers.

### **Reducing CO<sub>2</sub> from business-related travel and the distribution of goods**

We are already taking a range of steps to reduce the CO<sub>2</sub> from business-related transport. For example, the Energy Saving Trust conducts Green Fleet Reviews for fleets of over 50 vehicles, as well as providing advice to smaller fleets, to help them cut costs and emissions.

We will continue to work with the bus, freight and logistics industries, to help lower their emissions and operating costs. The 'Safe and Fuel Efficient Driving' (SAFED) programme includes eco-driving for van and HGV drivers, and we are extending this to bus drivers.

We are providing targeted support to enable companies to transfer freight from road to rail or water. In 2007 alone we spent £17.5 million to promote intermodal and bulk rail freight journeys through freight modal shift grant schemes.

Beyond these actions, our aim is to make lower carbon decisions on transport easier and more self-sustaining for business. We want to explore how best to generate greater levels of senior management attention on strategies for reducing transport emissions.

With the freight and logistics industry, we have today launched a new working group to develop a consistent carbon measurement and reporting method and standard for the logistics transport supply chain. This will be a standard for industry, developed by industry, and we anticipate that it will form the basis of any future reward structure – such as a voluntary recognition scheme – which industry, or potentially Government, could develop.

### **The need to travel**

We also recognise that there can be opportunities for reducing the amount we need to travel. We see two main areas of possibility. First is the use of information technology which has the potential to enable access to the people, goods and services we need without having to travel.

The second opportunity is in spatial planning. The pattern of transport demand is heavily affected by the way we use land and we need to ensure that the planning system takes full account of the potential consequences of development for transport.

## **Using market mechanisms to encourage a shift to lower carbon transport**

Factoring carbon costs into the prices we pay for transport provides incentives for us to be either more energy efficient or to opt for lower carbon alternatives. It also sends the right long-term signals for investment.

### **Promote the use of trading systems to reduce emissions in aviation and shipping**

Trading systems are particularly relevant to international emissions, such as those from aviation and shipping. These sectors operate across international borders and serve global markets – and consequently we consider that action is best taken at international level to address them.

This is why we are pressing for the inclusion of international aviation and shipping in the global deal being negotiated at Copenhagen, and we are promoting international emissions trading mechanisms as a key policy lever. We have played

a leading role in the decision to include CO<sub>2</sub> emissions from aviation in the EU Emissions Trading System from 2012.

### **Sending price signals through fiscal measures**

Fiscal measures primarily play an important role in ensuring the stability of the public finances but can also have a significant impact on CO<sub>2</sub> emissions from transport. They can lead to cuts in CO<sub>2</sub> by, for example, incentivising fuel-efficient vehicle purchases, encouraging more fuel-efficient behaviour and potentially encouraging lower carbon transport choices more generally.

Fiscal measures, such as fuel duty, company car tax, vehicle excise duty and air passenger duty provide these price signals to businesses and consumers.

### **Price and public transport**

The Government is taking action to make public transport affordable through substantial investment in railways and buses. The England-wide mandatory bus concession means 11 million people are eligible for free bus travel in England. The new Local Transport Act also gives local authorities powers to agree maximum fares with operators.

The Government regulates the fares for about 60 per cent of all rail journeys. Over the past 12 years there has been a small rise – about 5 per cent – in the real cost of regulated rail fares, during a period when average disposable income has increased by more than 20 per cent.

## **The impact of this strategy**

The measures set out in this strategy will ensure that transport makes a major contribution to the UK's efforts in reducing CO<sub>2</sub> emissions.

Before the impact of measures in this strategy are taken into account, our existing policies mean that emissions from transport are projected to be around 15 million tonnes of CO<sub>2</sub> lower than they would otherwise have been in 2020.

On top of this, the further measures set out in this strategy mean that we project to save an additional 17.7 million tonnes of CO<sub>2</sub> in 2020, equating to 85 million tonnes of CO<sub>2</sub> over the third carbon budget period from 2018-2022.

## **How this strategy will work**

The success of this strategy will rely on the concerted efforts of many – there are important actions to be taken by government and business and important choices to be made by individuals.

## **National government**

Nationally, we will need to set the performance frameworks and invest in lower carbon transport technology and fuels; as well as promoting public transport, sustainable modes, greater integration and providing better information. And we have an important role in advocating the promotion of lower carbon transport with our international partners.

We are also committed to changing the way long-term transport planning decisions are made. Reducing emissions of CO<sub>2</sub> and other greenhouse gases is one of the five goals that will guide future transport policy-making and infrastructure investment decisions.

We will also lead by example in how we manage emissions from our own operations and estate.

But there are many wider decisions taken outside the development of transport policy that will affect transport demand and use. We are committed to improving the way that central government departments work together on the collective effort to reduce emissions, working through a system of carbon budget management.

## **Partners in local and regional government**

We want to encourage local and regional government to prioritise the reduction of CO<sub>2</sub> emissions, not only those from decisions that affect transport directly, but in the whole range of local services, planning and decisions.

## **Industry and business**

We want to maintain and develop the constructive relationships we have forged in working on the CO<sub>2</sub> agenda – be that via the design of regulations, promoting research and development or sharing knowledge and expertise. Crucial to the success of this strategy are the innovators responsible for developing new technology. We believe strongly that the UK has the resource and resolution to make the most of the opportunities presented by a shift to lower carbon technology.

In all organisations where transport represents a significant cost, we want to maximise and accelerate the uptake of strategies to increase operational efficiencies, or to invest in more fuel-efficient vehicles, technologies and infrastructure.

There is a role too for employers to consider measures to reduce the carbon footprint of business trips and journeys to and from work. Government will work with industry and business to get the maximum carbon reduction return in all these areas.

## **Individuals**

Government is committed to supporting and fostering a good, strong public transport system – to help people get around and find lower carbon options for how they travel. When we do need to travel, we can consider whether a lower carbon option is available to us – these may also reduce costs or have benefits for quality of life, for example in a shift to more active modes.

## **Moving ahead**

We have set out much in this strategy that we need to deliver. This will be a priority for us in the period ahead.

But we will not stop here. There are proposals set out in the strategy that are likely to offer further cuts in emissions, but we are yet to quantify their likely impact. And there are more options to explore with our stakeholders. We will continue to develop these as we progress our strategy in the months and years ahead.

In Spring 2010 we will set out more details of our future programme. This implementation plan will give details of our delivery milestones and the mechanisms through which we will monitor progress.

# Chapter 1

## Introduction



# Introduction

- 1.1** Decarbonising transport is an essential part of building a low carbon future for Britain.
- 1.2** By 2050 we can expect to see a fundamentally different transport system in our country. The possibilities are far-reaching – electrified road and rail (powered by clean electricity), lower carbon aircraft designs, radically different information and traffic management systems, and renewed enthusiasm for clean forms of movement such as walking and cycling. Our transport networks will give people and business more low carbon<sup>1</sup> choices about when, where and how to travel, or to transport goods.
- 1.3** If we get this right, road and rail transport in 2050 will be largely decarbonised. Complete decarbonisation is unlikely to be possible for aviation and shipping as the technical challenges are greater, but these modes will have seen a transformative improvement in efficiency.
- 1.4** There will always be uncertainty looking this far ahead. There are a number of pathways to achieving our vision and we cannot predict definitely which technologies will emerge as front-runners, or exactly how people will choose to live their lives.
- 1.5** The picture to 2022 is clearer and we have a route map for getting there. Emissions from new cars will be reduced dramatically; there will be greater take up of alternative fuels; more active travel and better quality information will have become part of our everyday experience.
- 1.6** We have analysed how best to reduce emissions across the whole economy and we have a clear sense of the scale of contribution that transport needs to make. This new strategy sets out the actions we need to take now, and the work we will need to take forward in the period to 2022. It also outlines how we are putting the building blocks in place for longer-term change, to inform decision making for the period to 2050.

The strategy is based on the following themes:

- Supporting a shift to new technologies and fuels
- Promoting lower carbon transport choices
- Using market-based measures to encourage a shift to lower carbon transport

- 1.7** We begin by describing the current level of transport emissions and the scale of reductions we need to make. We then explore our aims and activities in more depth under each of the themes outlined above. Finally, we summarise the impacts of our strategy and what it means for people, business and government.

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<sup>1</sup> Throughout this strategy the terms ‘carbon’ and ‘CO<sub>2</sub>’ are used interchangeably in the interests of simplicity. The UK’s carbon budgets and targets are set in terms of all 6 of the Kyoto greenhouse gases. 99 per cent of transport greenhouse gas emissions are CO<sub>2</sub>. Transport’s main contribution to the carbon budgets will therefore be a reduction in CO<sub>2</sub> emissions.

# Chapter 2

## Transport and climate change – the need for action



# Transport and climate change – the need for action

## Why act now?

- 2.1 Climate change is already happening. Even if we take immediate and drastic steps to reduce emissions, significant change is going to occur throughout the world.
- 2.2 But it is not too late to avoid dangerous levels of climate change – average surface temperature increases greater than 2°C by 2050 – if the world acts collectively and decisively. Moving to a low carbon world will not be cost-free, but inaction will mean far greater costs in the future.
- 2.3 The expert consensus is that global greenhouse gas emissions need to fall by at least 50 per cent by 2050.<sup>2</sup> To achieve this degree of reduction, a developed country such as the UK will need to go even further. This is why our overall national target, as set out in our Climate Change Act, is at least an 80 per cent reduction in greenhouse gas emissions by 2050. We believe this is entirely consistent with the sustainable development of our economy, society and environment. It will mean that we can all enjoy a better quality of life, without compromising the quality of life of future generations.
- 2.4 Decarbonising transport must be part of the solution. It will be a major change, but moving to a low carbon economy and transport system also presents huge opportunities.
- 2.5 Government will provide leadership and a clear framework for policy and investment to ensure these opportunities are seized. This strategy is published alongside *The UK Low Carbon Transition Plan*<sup>3</sup> which sets out how we will meet our carbon budgets across the whole economy. It also complements the *Low Carbon Industrial Strategy*<sup>4</sup> where the Government has set out its intent to maximise the economic benefits to the UK from its low carbon future. And for individuals, we want to promote lower carbon transport, for its environmental benefit and because we see it as an opportunity to improve quality of life.

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2 For example, see Building a low-carbon economy – the UK's contribution to tackling climate change (Committee on Climate Change, December 2008)

3 [http://www.decc.gov.uk/en/content/cms/publications/lc\\_trans\\_plan/lc\\_trans\\_plan.aspx](http://www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx)

4 <http://www.berr.gov.uk/files/file52002.pdf>

There are a number of pathways to reducing emissions by 2050, both across the economy and within transport. Whichever path we choose, over the long term it is clear that a transformative shift to low carbon transport is needed.

On the basis of sound evidence, our strategy identifies the most cost-effective ways to decarbonise transport. In this chapter, we set out:

- The comprehensive legislative framework of legally binding targets and carbon budgets for reducing emissions across the economy to 2022 and 2050;
- The scale of challenge for reducing transport emissions; and
- How we have built the evidence base that underpins this strategy.

## The legislative framework

**2.6** Concerted global action to tackle climate change is essential. *The Road to Copenhagen*<sup>5</sup>, published in June 2009 sets out how Government hopes to build on the Kyoto commitments by working with our EU partners at negotiations in Copenhagen in December 2009. We will be pressing particularly hard for the inclusion of international aviation and shipping in a global deal.

**2.7** At a European level, a package of targets aimed at cutting greenhouse gas emissions across the EU by 20 per cent by 2020<sup>6</sup> and delivering 20 per cent of energy from renewable sources by 2020 is already in place. The transport sector in the UK will contribute to these targets in a variety of ways.

- By subjecting carbon dioxide (CO<sub>2</sub>) emissions from aviation to a legally-binding, tightening cap from 2012 through the EU Emissions Trading System (EU ETS). Further detail on the EU ETS is in chapter 5.
- By sourcing 10 per cent of transport's energy from sustainably produced renewables by 2020. Chapter 3 provides further detail.
- By contributing to a 16 per cent reduction in greenhouse gases by 2020 (on 2005 levels) across those sectors not covered by a trading scheme. Collectively this is known as the non-traded sector – comprising mainly domestic transport, heat, agriculture and waste.

5 The Road to Copenhagen: The UK's case for an ambitious international agreement on climate change June 2009 <http://centralcontent.fco.gov.uk/central-content/campaigns/act-on-copenhagen/resources/en/pdf/road-full-document-pdf>

6 If other developed and developing countries make sufficiently ambitious commitments, and developing countries contribute adequately, this will increase to 30 per cent. [http://ec.europa.eu/environment/climat/climate\\_action.htm](http://ec.europa.eu/environment/climat/climate_action.htm)

- 2.8** Government has also shown leadership at home. Through the Climate Change Act 2008, we are committed to reducing our greenhouse gas emissions across the economy by at least 34 per cent by 2020 and by at least 80 per cent in comparison to 1990 levels by 2050.<sup>7</sup>
- 2.9** The effective decarbonisation of the transport sector will play a big part in achieving this goal and the detail of our approach is provided in this strategy.

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<sup>7</sup> This target is set in the Climate Change Act 2008, which requires that the average annual emissions in the carbon budget period including the year 2020 (i.e. the third period, 2018–2022) are at least 34% below the 1990 baseline. This is referred to as a 34% reduction by 2020 for simplicity throughout this strategy.

## The Climate Change Act 2008

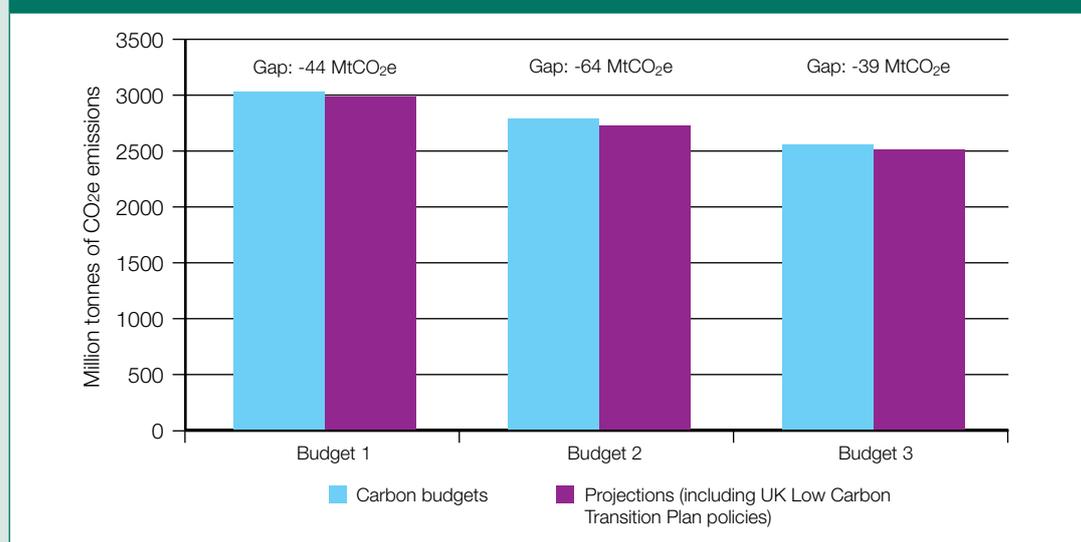
The groundbreaking Climate Change Act 2008 introduces a binding long-term framework to reduce greenhouse gas emissions, towards a target of at least an 80 per cent reduction below 1990 levels by 2050. A system of ‘carbon budgets’, which limit UK emissions over successive five-year periods, will set the trajectory towards 2050. At least three carbon budgets must be set ahead at any time to allow businesses to plan and invest with certainty about the future direction of travel.

Carbon budgets are a world first – they will drive the UK’s transition to a low carbon economy by committing us to a series of legally binding emission caps between now and 2050.

The Act established a new independent, expert body – the Committee on Climate Change – to advise the Government on the level of the carbon budgets and report annually on progress made towards meeting them.

We announced the first three carbon budgets, covering the periods 2008–12, 2013–17 and 2018–22, in April alongside Budget 2009.<sup>8</sup> They require emissions reductions of just over 22 per cent, 28 per cent and 34 per cent respectively, below 1990 levels (see Figure 2.1 below), and are in line with the recommendations of the Committee on Climate Change.<sup>9</sup>

**Figure 2.1: Our carbon budgets are equivalent to a 34 per cent cut in greenhouse gas emissions in the third budget period**



Source: Department of Energy and Climate Change 2009

**2.10** It is vital that action is taken internationally to reduce emissions from aviation and shipping – as their networks span national borders and operators compete globally, as well as nationally and regionally.

<sup>8</sup> [http://www.hm-treasury.gov.uk/bud\\_bud09\\_index.htm](http://www.hm-treasury.gov.uk/bud_bud09_index.htm)

<sup>9</sup> <http://www.theccc.org.uk/reports>

- 2.11** Securing international agreement to reducing emissions from aviation and shipping will be one of the UK's highest priorities for the Copenhagen negotiations – to set realistic global sectoral targets for aviation and maritime emissions that are consistent with limiting climate change to no more than 2°C above pre-industrial times.
- 2.12** We also want all countries to commit to work through the International Maritime Organization and International Civil Aviation Organization (ICAO) to identify, agree and implement specific measures to meet these targets within an agreed timeframe.
- 2.13** Consistent with the advice of the Committee on Climate Change (CCC), international aviation and shipping are not part of our domestic targets although aviation is bound into the 2020 EU level targets, through its participation in the EU ETS. The Government will make proposals to Parliament on the case for bringing aviation emissions fully within the UK's carbon budgeting framework by the end of 2012, taking account of progress towards a global agreement.
- 2.14** The Government has also sent a strong signal to the air transport industry by announcing a new target to bring CO<sub>2</sub> emissions from UK aviation below 2005 levels by 2050<sup>10</sup>. This ambitious target is designed to drive emissions reductions against a backdrop of rising passenger demand. We encourage other countries to set similar, stretching domestic targets to underpin efforts at global level.

## The scale of the challenge

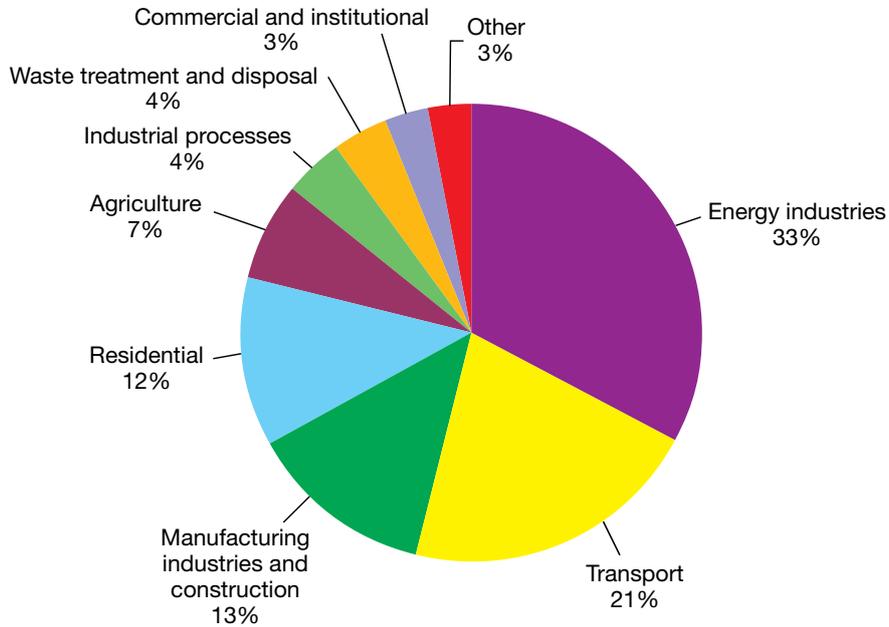
- 2.15** Since 1990, greenhouse gas emissions from domestic transport have increased by 12 per cent and now represent 21 per cent of total UK domestic emissions. Of this, domestic road transport is by far the biggest emitter at around 92 per cent<sup>11</sup>. Making significant in-roads into these emissions alongside taking action in other modes will help ensure that low carbon transport becomes a reality.

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<sup>10</sup> <http://www.dft.gov.uk/adobe/pdf/173201/infrastructure.pdf>

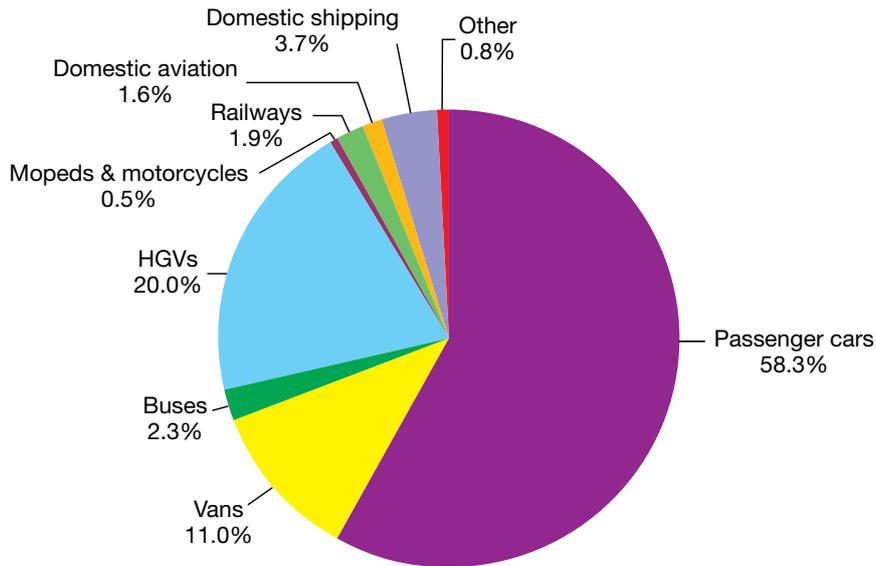
<sup>11</sup> Source: National Atmospheric Emissions Inventory (IPCC categories)

**Figure 2.2: Transport is a significant source of domestic greenhouse gas emissions**



UK domestic greenhouse gas emissions by source category, 2007 'Other' includes: fugitive emissions from fuels, agriculture and forestry fuel use, military aircraft and shipping, land use, land-use change and forestry (LULUCF). Source: National Atmospheric Emissions Inventory (IPCC categories) 2007.

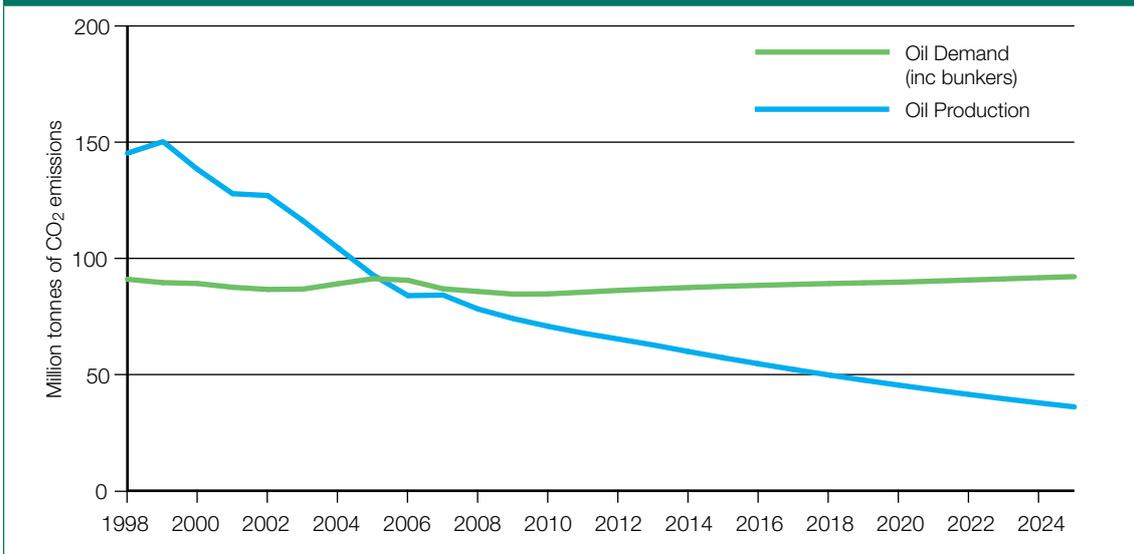
**Figure 2.3: Travelling by road accounts for 92% of the domestic transport sector's greenhouse gases**



Greenhouse gas emissions from UK domestic transport by source, 2007 'Other' includes LPG emissions; road vehicle engines; aircraft support vehicles. Source: National Atmospheric Emissions Inventory (IPCC categories) 2007.

**2.16** The actions in this strategy also have the benefit of reducing our reliance on oil and our import requirements, compared to what we would otherwise need. In 2007 almost 70 per cent of our crude oil was from UK and Norway, but our reserves are declining and the UK will increasingly be a net importer of crude oil.

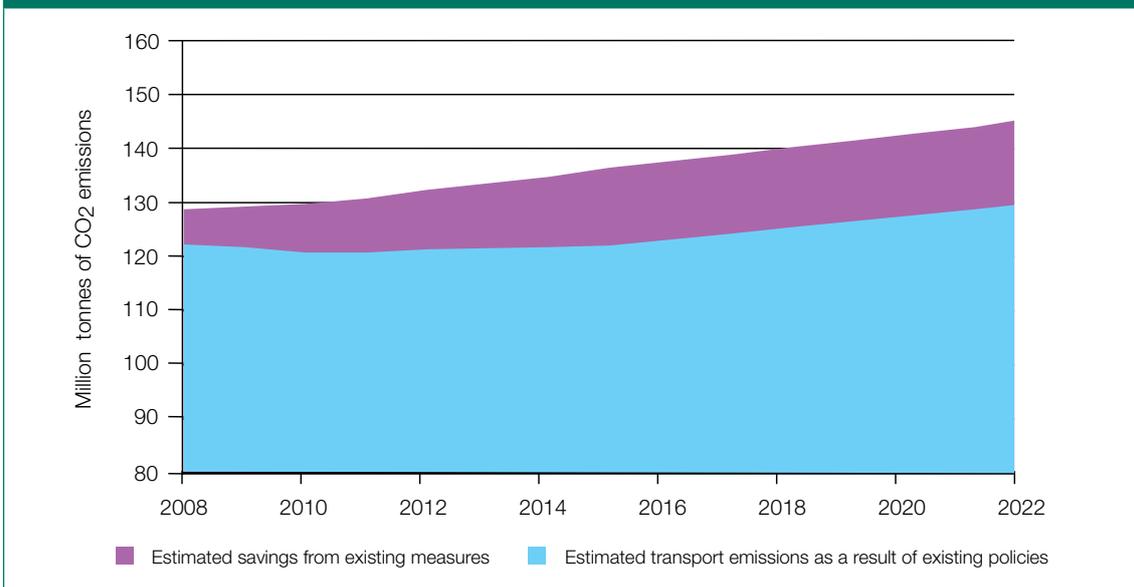
**Figure 2.4: The UK will increasingly be a net importer of crude oil**



Source: Department of Energy and Climate Change 2009

**2.17** We already have a range of measures in place to address transport emissions. Figure 2.5 shows that these measures are expected to contribute a substantial reduction in emissions (about 15 million tonnes of CO<sub>2</sub> by 2020) compared to where they would otherwise be.

**Figure 2.5: Our existing actions have a big effect, but more is needed**



Source: DfT analysis 2009

- 2.18** This strategy builds on these measures and, in developing our approach, we have worked with a variety of stakeholders to explore the challenge of decarbonising the transport system. Some reasons emerged why it was seen as worthwhile but difficult:
- Our existing vehicles, fuels and infrastructure are long established, and our economy, business and lifestyle has built up around them.
  - There are strong links between transport and lifestyle choices. People value good transport highly, and some people see little reason to make greener travel choices. This could be due to a number of factors, such as not having access to, or being aware of, lower carbon options.
  - Industry has improved services and technology for a range of reasons to do with safety, efficiency, security and health, improved performance, accessibility and so on. But we need to ensure that industry direct their innovative energies on a long-term CO<sub>2</sub> agenda as well.
  - Changing transport infrastructure can be expensive – we all want better transport and lower costs that come from better efficiency, but new technology requires significant investment and can come at a price.
  - It is difficult for the UK alone to influence international transport, where networks and businesses serve global markets. Many regulations that affect transport, and many of the products used in transport are developed beyond the borders of the UK. Therefore we need commitment and collaboration at European and international level.
  - Finally, many government policies, whilst not being directly aimed at transport, can have a significant impact on transport demand and emissions. Where this is the case, we will need to ensure that the policies encourage sustainable, low carbon travel and transport patterns.
- 2.19** It is important that we turn these challenges into opportunities so that we can deliver our emissions reduction goals. This strategy provides our current view on policies and proposals to 2022. We expect to do more and will continue to assess the merits of additional policy measures, as part of our long-term transport planning process and as our understanding of the data increases.

## Building the evidence

- 2.20** A sound evidence base underpins the policies and proposals set out in this strategy.
- 2.21** Since the publication of *Towards a Sustainable Transport System* in October 2007<sup>12</sup> we have been working to understand the impacts, cost-effectiveness and durability of different emissions reduction policy measures. Our aim has been to develop our ideas in an informed and evidence-based way.
- 2.22** In July 2008, we published the initial phase of this work *Carbon Pathways Analysis: Informing Development of a Carbon Reduction Strategy for the Transport Sector*<sup>13</sup>. As well as updating the projections on emissions by mode, this innovative work provided new insights into the drivers of transport demand by looking for the first time at how emissions relate to different types and lengths of household journeys. We have since updated key elements of this work to take account of new estimates for the additional fuel used to warm the engine when starting a car from cold<sup>14</sup>.
- 2.23** Together this suggests a range of areas that policy interventions could address. These include: encouraging more efficient use of our cars; tackling business-related journeys (including commuting) – which represent a significant proportion of car emissions (at around 37 per cent); and influencing logistics and freight operation, where emissions per vehicle per year are much higher than for personal motoring.

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12 <http://www.dft.gov.uk/about/strategy/transportstrategy/pdfsustaintransssystem.pdf>

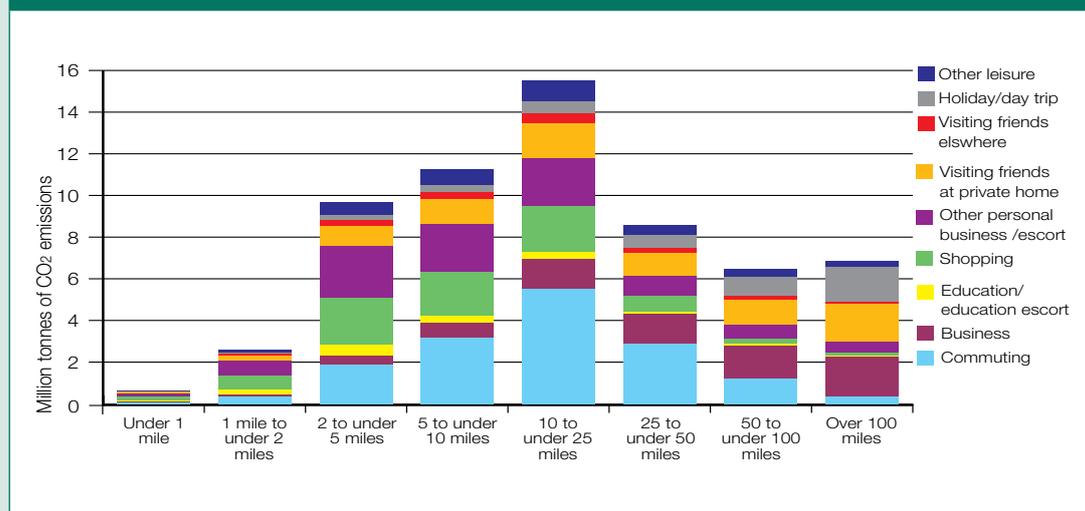
13 DfT (2008), *Carbon Pathways Analysis: Informing Development of a Carbon Reduction Strategy for the Transport Sector*, <http://www.dft.gov.uk/about/strategy/transportstrategy/tasts/tastscarbonpathway/>

14 The calculations were produced for DfT by TRL and are a “worse-case” scenario, e.g. long parking duration and low ambient temperature. These are based on a model developed in the ARTEMIS project by André J-M and Jourard R (2005) *Modelling of cold start excess emissions for passenger cars* INRETS Report LTE0509.

### Updated analysis of CO<sub>2</sub> by journey purpose

We have refined our analysis of journey types and related CO<sub>2</sub> emissions to include the impact of “cold starts”. The pattern of car emissions by journey purpose and length is very similar to those published in July 2008. The greatest proportional increases have been in shorter length journeys. For example, CO<sub>2</sub> emissions from journeys of under 1 mile and 1-2 miles are 24 per cent and 25 per cent higher respectively than we estimated previously. However these journey bands produce the lowest amount of car emissions overall, so the impact on total CO<sub>2</sub> relatively is low. The highest absolute increase in CO<sub>2</sub> is seen in the 2-5 mile journeys with an additional 1.4 million tonnes of CO<sub>2</sub> (an increase of 17 per cent); the number of trips in this distance band is highest (a third of all trips).

**Figure 2.6: Commuting and business trips generate over a third of car emissions**



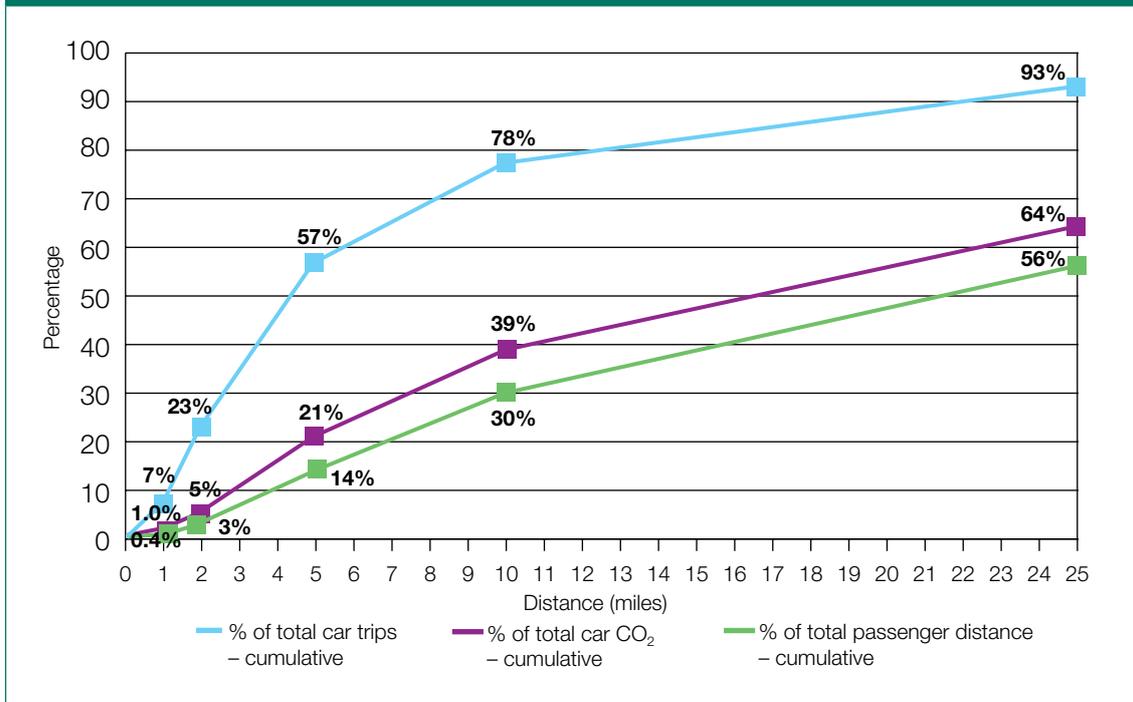
*Estimated CO<sub>2</sub> emissions from household cars by journey purpose and journey length, GB, 2002/2006 average.*  
 Source: DfT Analysis, 2009

We expect to update the carbon pathways analysis periodically as our evidence base develops. This will feed the ongoing process to identify further policies that reduce transport emissions.

**2.24** Our analysis continues to underline the importance of tackling emissions over a range of journey lengths, types and modes. Figure 2.7 shows the cumulative trips, passenger distance and CO<sub>2</sub> emissions from household car journeys by journey length. This indicates that 21 per cent of CO<sub>2</sub> emissions arise from journeys of less than 5 miles, and 64 per cent from those of less than 25 miles. A switch to public transport or more active modes of travel such as cycling and walking can reduce emissions over shorter distances and, where public transport is not a viable option over longer distances, increasing the fuel efficiency of cars will have an important

impact. Vehicle efficiency improvements and an increase in levels of occupancy could have benefits across all distances.

**Figure 2.7: Longer car journeys are few in number but high in emissions**



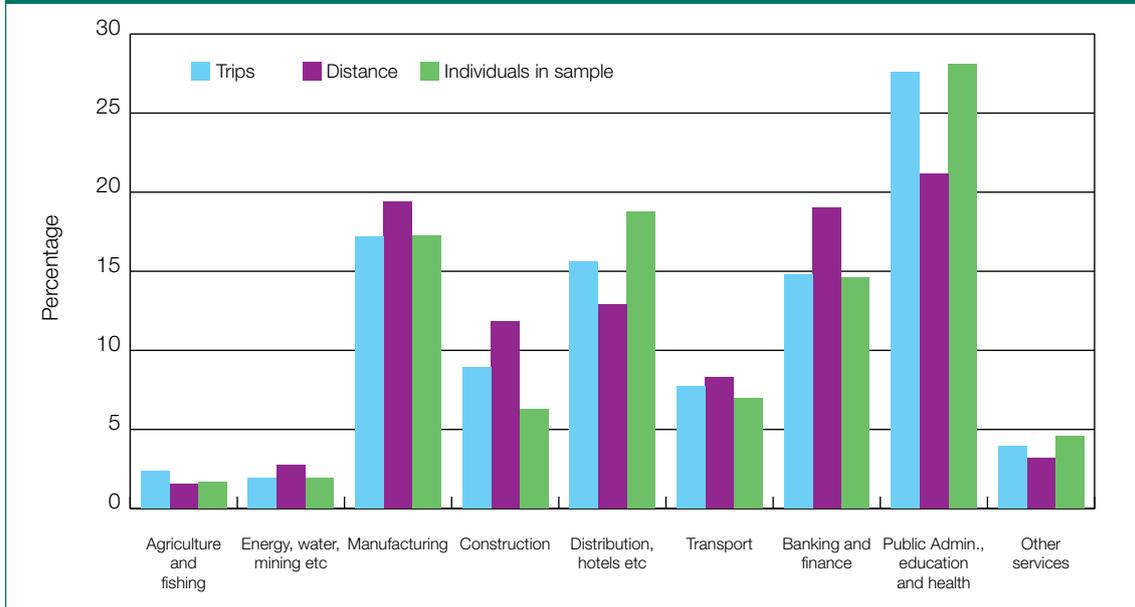
*Cumulative trips, passenger distance and CO<sub>2</sub> emissions from household car journeys by trip length, GB, 2002/2006.*  
Source: DfT Analysis, 2009

**2.25** We continue to build our evidence and are looking at different ways to interpret our data. For example, looking at the traveller characteristics for particular journey types and lengths provides some interesting results:

- There are marked differences in travel patterns between different groups in society, such as by gender, age and income. For example, looking at travel by all modes, women make slightly more trips per person per year on average than men but travel much shorter distances. The purpose of their trips also differs. The relative importance of shopping and personal business trips increases with age – among people aged 17-29, 26 per cent of trips were for these purposes, while for those aged 70 and over the proportion was 59 per cent.<sup>15</sup>
- Analysis of the characteristics of household car drivers demonstrates that those people working in the public administration, education and health industry account for the largest proportion of commuting and business trips (28 per cent) and distance travelled (21 per cent). The public sector is a large employer, and government therefore has an opportunity to lead the way in reducing emissions from this type of travel.

<sup>15</sup> DfT National Travel Survey

**Figure 2.8: Workers in the public sector account for the greatest proportion of commuting/business trips**



*Car driver trips and distance travelled for commuting/business by industry worked in, GB, 2002/2006.*  
 Source: National Travel Survey 2002–2006

- 2.26** Some of these conclusions may seem self-evident, but analysis such as this will help us to target policy in the right way.
  
- 2.27** We are also looking at freight movements across the transport network by commodity and length of journey. This will give us a much better understanding of how the network is being used by the logistics sector and will help us develop informed and targeted policy interventions including those around encouraging greater use of low carbon modes.
  
- 2.28** We have worked to understand popular attitudes towards transport and climate change. People are increasingly aware of climate change and often have good intentions of reducing their carbon footprint, but these intentions are not always followed through. This is considered in more depth in chapter 4.
  
- 2.29** Many publications and stakeholders have already highlighted the different options available to us in transport. For example, the King Review<sup>16</sup> set out the scope for achieving significant emissions reductions from cars over the short, medium and long-term. The Gallagher Review<sup>17</sup> highlighted the potential for greenhouse gas savings from biofuels, but also emphasised the importance of sustainability and the avoidance of negative direct and indirect impacts. The Committee on Climate Change has also provided its

16 [http://www.hm-treasury.gov.uk/king\\_review\\_index.htm](http://www.hm-treasury.gov.uk/king_review_index.htm)

17 [http://www.dft.gov.uk/rfa/\\_db/\\_documents/Report\\_of\\_the\\_Gallagher\\_review.pdf](http://www.dft.gov.uk/rfa/_db/_documents/Report_of_the_Gallagher_review.pdf)

view on the contribution that transport can make to reducing emissions across the economy.

- 2.30** Using this evidence we have tested a range of new domestic policies for their impact on emissions and their cost-effectiveness. Further detail on the impacts of this strategy can be found in chapter 6. More detail of the policies assessed can be found in the Impact Assessment accompanying this document.
- 2.31** Putting transport on a new low carbon trajectory is a long-term undertaking. We need to create a framework for change that is responsive to cultural, social, economic and technological developments. This will help make sure that we do not lock ourselves into measures that later prove to be ineffective or more costly than necessary. This strategy describes our approach to achieving this.
- 2.32** In some cases, we will need to provide additional capacity to relieve the most acute pressure points on our railways, roads and airports, while at the same time taking decisive action to bear down on transport's overall carbon emissions.
- 2.33** The following chapters set out the policies and proposals designed to deliver transport's contribution to the UK's carbon budgets up to 2022 and beyond. We will develop a more detailed implementation plan providing key milestones and monitoring arrangements in spring 2010. Chapter 6 provides our current assessment of the emissions savings that this strategy will deliver.

## Adapting our transport networks to cope with the unavoidable impacts of climate change

- 2.34** This strategy is about mitigating the effects of climate change by reducing CO<sub>2</sub> and other greenhouse gas emissions. But as an operator of national transport networks and with an important role to play across city, regional and international networks, we take very seriously the need to ensure that our transport system is resilient to the challenges of unavoidable climate change.
- 2.35** We are already working to adapt our transport systems to the effects of climate change. Although not covered in this publication, we are committed to meeting our obligations on adaptation as set out in the Climate Change Act 2008. We are playing a key role in the Government's Adapting to Climate Change Programme and are fully integrating consideration of a changing climate into the long-term planning and management of our transport networks.

**2.36** We are working closely with agencies and stakeholders to ensure adaptation is taken into account. Within the rail industry we are supporting the progression of their adaptation work such as improved track specifications and drainage to cope with higher temperatures and increased rainfall. The Highways Agency has already completed research on adapting materials and techniques in highway works. The Agency has begun to implement measures such as introducing new road surface specifications so that the road network is less likely to be affected by future high temperatures, and revised drainage standards allowing for increases in rainfall intensity of 20–30 per cent.



# Chapter 3

## Supporting a shift to new technologies and cleaner fuels



# Supporting a shift to new technologies and cleaner fuels

- 3.1** Transport technologies and fuels are well established. The internal combustion engine has dominated the market for over 100 years and huge amounts of expertise and resource have been invested in the transportation and fuelling systems we see today.
- 3.2** Vehicle performance, efficiency and safety have improved dramatically over time and we expect this progress to continue. The need to tackle climate change presents both a major challenge and an opportunity for those industries which respond most quickly with new and attractive low carbon transport technology. Government must set a framework that encourages these innovations to be developed and delivered to market.
- 3.3** Technology and cleaner fuels alone will not be the answer to the CO<sub>2</sub> challenges in transport – when, where and how we travel will all need to evolve. Transport underpins our quality of life and economic prospects. It is for this reason that we must harness the full potential of low carbon technology across all modes.

By 2050, the radical decarbonisation of transport will be characterised by cleaner fuels, greener technology and a shift to renewable sources of energy. A wide range of technologies will be in play delivering substantial reductions in emissions from road and rail. UK aviation emissions will be reduced to below 2005 levels and ships will be more energy-efficient.

The actions that we are taking in the short to medium-term will deliver further efficiency gains from existing technology and will lay the foundations for a switch to new, greener technology in the longer-term.

Our strategy is designed to ensure that by 2022, the vehicles on our roads will be vastly more energy-efficient.

- This will primarily be delivered through advances in the efficiency of the internal combustion engine. Alongside this, new ultra-low emission vehicles will be available on the mass-market. Together, this will mean that, for example, new cars will emit on average 40 per cent less CO<sub>2</sub> than they do today.
- New vans will be subject to an ambitious performance framework for CO<sub>2</sub> reduction – analysis suggests that this could deliver significant improvements in fuel efficiency.
- Reducing emissions from HGVs is also vitally important and we will determine and implement the best combination of regulation, support for investment and best practice in order to achieve this.

And we will be promoting a shift to cleaner technology in public transport.

- Energy efficiency improvements and greater electrification will deliver a lower carbon rail system.
- We expect the reform of Government's subsidy to the bus industry and support for investment to make low carbon buses commercially viable – heralding the transformation to a greener bus fleet.

Technology improvements will also be flowing through for aviation and shipping with more radical developments out to 2050. These will come from a combination of measures, including better fuel efficiency and improvements to operations, as well as the use of market-based measures to drive technological change.

Sustainable biofuels can provide a low carbon alternative to fossil fuels. Promoting the use of these is an important part of our strategy to 2022 and thereafter to 2050.

## The challenge

- 3.4** New technology is costly to develop and is invariably more expensive when it is first offered to the market. Yet consumer demand is required to generate the scale of production that will pull costs down over time. This

risks creating a vicious circle and potential market failure – government needs to intervene to ensure that this does not happen.

- 3.5** It takes time to change people's perceptions of the performance and reliability of new low carbon vehicle technology. And it takes time to develop the technology to the stage where it is ready to bring to market. Our frameworks must therefore consider the need for a shift in attitudes of individuals and business, as well as the product development cycles for industry.
- 3.6** To support a shift to low carbon technology it is also essential to align our climate and energy objectives. The energy sector will need to be decarbonised (for example through use of nuclear power, renewable energy such as wind, or capturing the CO<sub>2</sub> created by burning fossil fuels) before we can reap the full benefits of greater electrification in transport.
- 3.7** It is difficult for the UK to act alone in trying to influence the development of transport technology. Standards are generally defined at European or wider international levels, and international transport networks serve global markets. A key part of our strategy is therefore to collaborate and build commitment with our international partners, including through ICAO and the IMO.
- 3.8** Finally, as an emerging technology there remains much scientific uncertainty surrounding the full social and environmental impacts of biofuels. The Gallagher Review<sup>18</sup> warned that unsustainably produced biofuels have the potential to increase net greenhouse gas emissions. Some biofuels risk displacing food production and creating emissions through land-use change – for example when biofuel production on agricultural land displaces food production into environmentally sensitive areas, such as the rainforest. The Government is therefore committed to promoting the use of those biofuels which are truly sustainable across transport modes.

## Taking action to turn our vision into reality

### Cars and vans

- 3.9** Emissions from cars and vans represent a significant share of the road transport total. Whilst the average emissions of new cars on UK roads has fallen from 189.8gCO<sub>2</sub>/km in 1997 to 158.0gCO<sub>2</sub>/km in 2008 (an improvement of 17 per cent)<sup>19</sup>, cars still accounted for 58 per cent of all greenhouse gas emissions from domestic transport in 2007.<sup>20</sup>

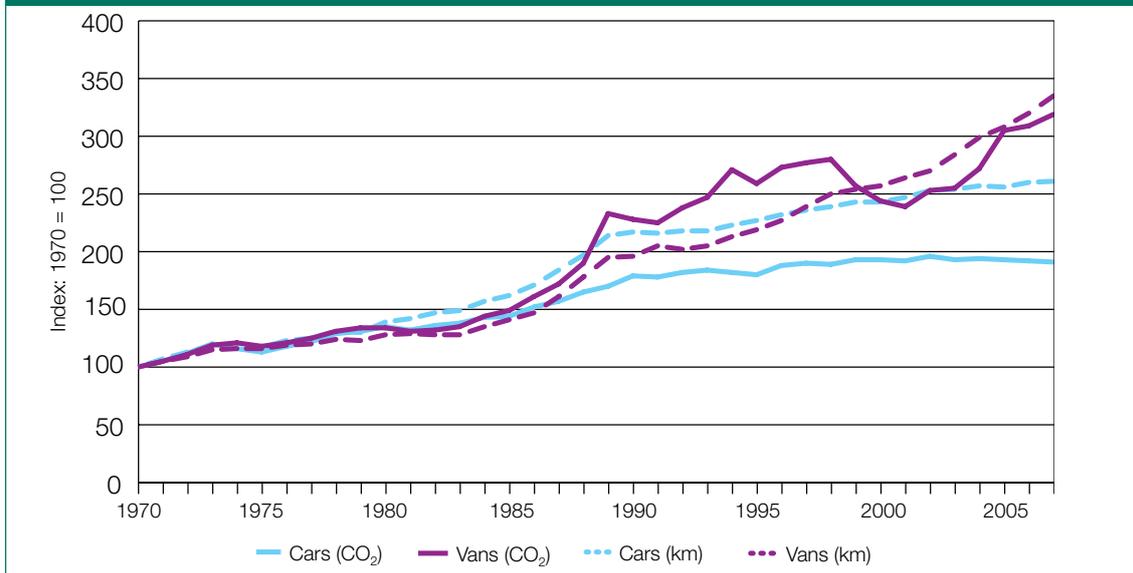
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18 [http://www.dft.gov.uk/rfa/\\_db/\\_documents/Report\\_of\\_the\\_Gallagher\\_review.pdf](http://www.dft.gov.uk/rfa/_db/_documents/Report_of_the_Gallagher_review.pdf)

19 SMMT, *New Car CO<sub>2</sub> Report* 2009

20 National Atmospheric Emissions Inventory (IPCC categories)

**Figure 3.1: Since 1970 vehicle kilometres have roughly tripled for both cars and vans**



Road transport CO<sub>2</sub> emissions and vehicle kilometres from road transport, 1970-2007.  
Source: National Atmospheric Emissions Inventory and Transport Statistics Great Britain 2008

**3.10** Our aim is to deliver a transformative shift to low carbon road transport by 2022, maximising the potential of technology to reduce substantially emissions from cars and vans. To achieve this shift we are:

- Tightening vehicle standards at a European level;
- Leading research, development and demonstration of low carbon vehicles;
- Making ultra-low carbon vehicles more competitive for consumers;
- Supporting the adoption of ultra-low carbon vehicles in lead cities and regions; and
- Exploring other technologies to improve fuel efficiency.

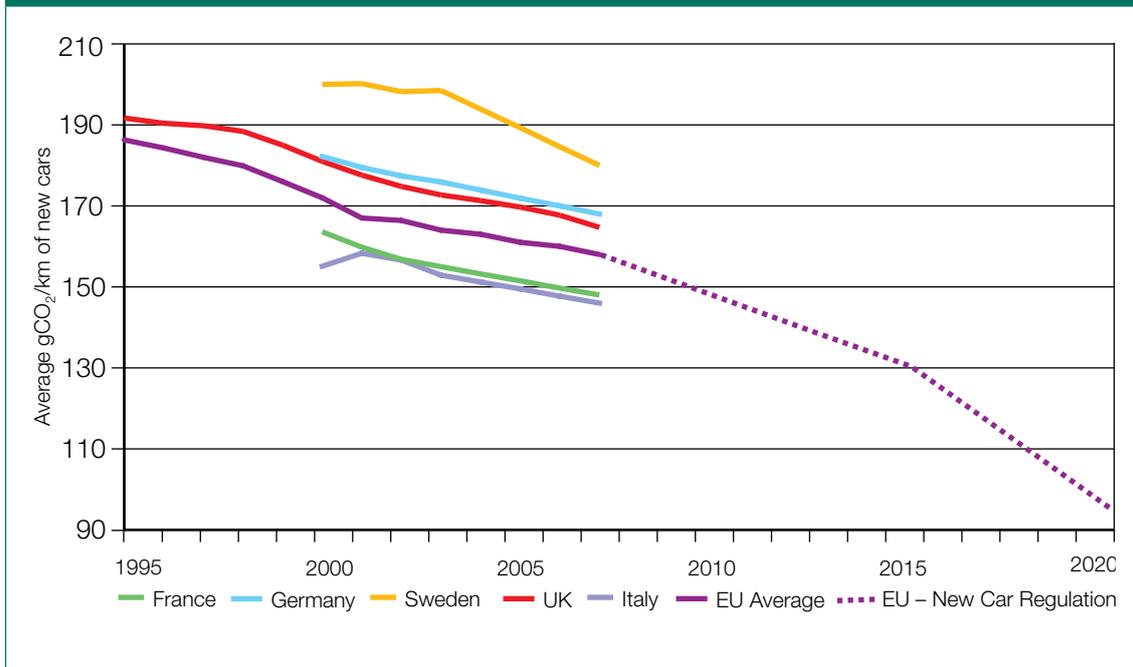
#### *Tightening vehicle standards at a European level*

**3.11** Our aim is to set an ambitious performance framework for CO<sub>2</sub> reduction that will help shape the market and send a clear signal to industry about the pace of change that is required. Regulating in this way can play a critical role in supporting the transition to low carbon vehicles by establishing a clear, long-term framework for action by industry.

**3.12** New EU standards adopted in April 2009 mean that by 2020 the average CO<sub>2</sub> emissions from new cars across the EU will be 95gCO<sub>2</sub>/km – a 40 per cent reduction on 2007 levels.<sup>21</sup> The UK was among the leading Member States calling for a competitively neutral mechanism, and a long-term target as part of the EU regulation.

<sup>21</sup> Regulation (EC) No 443/2009

**Figure 3.2: Vehicle efficiency in the UK has been improving**



Vehicle Efficiency, 1995-2020. Source: European Commission

### EU Regulation on New Car CO<sub>2</sub>

The EU's New Car CO<sub>2</sub> Regulation, which we supported, establishes a clear, long-term framework for action by industry to develop lower emitting vehicles.

In the UK alone, the Regulation is expected to reduce CO<sub>2</sub> emissions by 7 million tonnes of CO<sub>2</sub> a year in 2020.<sup>22</sup> It will also stimulate innovation across all segments of car production, large and small, whilst respecting the diversity and competitiveness of the car market across Europe.

Targets of 130gCO<sub>2</sub>/km from 2012, with full compliance by 2015, and 95gCO<sub>2</sub>/km by 2020 have been set to provide a clear and accelerating trajectory for the deployment of new low carbon technologies and vehicles. This provides a significant opportunity for UK business to innovate and be at the vanguard of developing new and attractive low carbon technology to meet this challenge.

The New Car CO<sub>2</sub> Regulation is a milestone towards the decarbonisation of passenger cars. Going forward we will work to influence the European Commission's review of the 2020 target, which must be complete by 2013, to ensure that the regulation delivers the maximum CO<sub>2</sub> savings possible. We will also work with the Commission to implement measures that inform drivers how to make CO<sub>2</sub> reductions from the way they use their vehicles, such as through gear shift indicators and tyre-pressure monitoring systems.

<sup>22</sup> DfT Analysis 2009

**3.13** To ensure that government leads by example, we have set targets for central government departments and their agencies to procure cars that meet the EU standard well ahead of schedule (to average 130g CO<sub>2</sub> per km in 2010/11). We will set revised emissions requirements for new administrative cars later this year. This will ensure the use and development of ever-greener vehicles in our fleets.

**3.14** We are equally determined to ensure an ambitious and achievable framework for long-term emissions reductions is applied to vans. Vans alone contributed 11 per cent of domestic transport emissions in the UK in 2007 and represent the fastest growing sector of motor vehicles usage, increasing 70 per cent from 1990 to 2007 compared to an increase of almost 20 per cent in car vehicle kilometres.<sup>23</sup>



**3.15** We support regulating emissions from new vans and are actively engaging with the European Commission as they develop their proposals and impact assessment for a regulation. Our priorities include the delivery of a well-designed and cost-effective mechanism similar to that in the car regulation, recognising the diversity of the van market. The regulation should also include clear targets for the medium and long-term and a mechanism to encourage the development of the ultra-low carbon van market.

#### *Leading research, development and demonstration of low carbon vehicles*

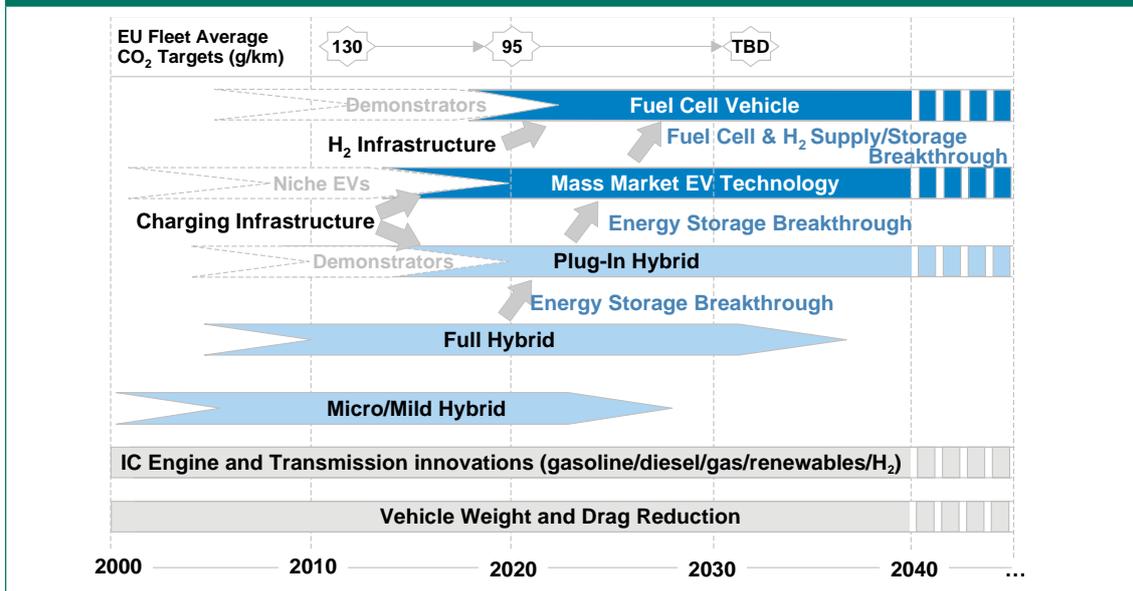
**3.16** We are looking to industry to innovate in order to deliver the challenging emissions reductions needed by 2022 and 2050. Improvements to the design and efficiency of the internal combustion engine will continue to play a central role. But achieving a transformative shift in the longer-term means changing the way that we build and power cars, with (dependent on the decarbonisation of the energy generating sector) an increasing shift to electrification – to hybrid, plug-in hybrid, fully electric and hydrogen powered vehicles.

**3.17** In May 2009 the New Automotive Innovation and Growth Team (NAIGT) set out a roadmap agreed by UK industry that shows how automotive technology will need to develop to 2050 in order to meet our CO<sub>2</sub> challenge<sup>24</sup>.

<sup>23</sup> *Transport Statistics Great Britain 2009*

<sup>24</sup> NAIGT, *An Independent Report on the Future of the Automotive Industry in the UK*, <http://www.berr.gov.uk/files/file51139.pdf>

Figure 3.3: The NAIGT roadmap



Source: An Independent Report on the Future of the Automotive Industry in the UK , NAIGT

**3.18** Figure 3.3 illustrates that a series of technology step-changes are needed to take us towards the production and mass marketing of low carbon vehicles:

- Improvements to conventional internal combustion engines will continue to take place. At the same time, early hybrids (which combine electric power with conventional fuels) become available, along with significant numbers of demonstrator electric vehicles;
- Further development of hybrids, including plug-in options, with breakthroughs in electric energy storage are expected; some hydrogen storage and fuel cell demonstrators begin to emerge;
- This would need to be followed by a further energy storage breakthrough enabling mass market electric vehicle technology; with further fuel cell demonstrators underway; and
- Eventually breakthroughs in fuel cell technology and hydrogen storage allow fuel cell vehicles into the market place.

**3.19** This timeline is only illustrative, but gives a sense of the progression of technologies out to 2050.

**3.20** Government will support the development and demonstration of new, cleaner, technology along this pathway. We intend to make the UK a leading place in the world to develop, demonstrate and manufacture ultra-low carbon vehicles.

- We have committed around £400 million to encourage development and uptake of ultra-low carbon vehicles. For example, around £140 million has been allocated to the Technology Strategy Board's 'Low Carbon Vehicle Innovation Platform'. The Platform brings together funding from across Government to support research, development and demonstration of low carbon vehicle technologies. This will help accelerate industry investment and facilitate new partnerships to address technical challenges. These developments will be relevant to the decarbonisation of passenger cars, as well as commercial and public service vehicles.

### Demonstrating low-carbon vehicles in the UK

In June the Technology Strategy Board announced the winners of its £25 million ultra-low carbon vehicles competition. Over the next eighteen months more than 340 electric-drive vehicles will be trialled in several UK regions. The vehicles range from 2-seater city cars right through to 7-seater multi-purpose vehicles and hydrogen fuel cell powered vehicles. Members of the public will



be users in the trial, and research will be carried out to look at the way the vehicles are used and charged on a daily basis, as well as investigating the perceptions of these vehicles by users and the general public. For example, in Hillingdon 15 Ford Focus electric vehicles will be trialled with charging points at users' homes and public car parks in the area.

This Innovation Platform programme is a critical first step in helping position the UK as a major force in the development and understanding of the potential market for electric and plug-in hybrid vehicles.

- In June 2009 we announced the winners in phase one of the DfT's low carbon vehicle procurement programme. Through this programme we are promoting the take up of low carbon and electric vans in a selection of public sector fleets (including those of the Government Car and Despatch Agency, the Metropolitan Police, and Coventry and Glasgow City Councils, amongst others).

**3.21** The Government is committed to leading by example in the area of sustainable vehicle procurement. The Government Car and Despatch Agency (GCDA) has one of the greenest fleets in the country and in 2008 was awarded one of the Energy Saving Trust's prestigious Fleet Heroes Awards.

### **“Greening” the Government Car and Despatch Agency (GCDA)**

In 2008 the Government Car and Despatch Agency received a Fleet Heroes Award from the Energy Saving Trust for its innovative driver training policy. The approach focuses on road safety and environmental responsibility leading to dramatic cuts in the GCDA’s fuel consumption.

The GCDA constantly monitors fuel consumption and promptly offers re-training to drivers whose fuel consumption is excessive. The driver training scheme has been developed in partnership with the Qualification Curriculum Authority and the City and Guilds awarding body, and is backed by the Institute of Advanced Motorists.

Green Cars, GCDA’s taxi service for government and public sector clients, uses conventional hybrid cars. These produce half the CO<sub>2</sub> emissions of traditional black cabs and make up the largest low carbon taxi fleet in London.

### *Making ultra-low carbon cars more attractive for consumers*

**3.22** Manufacturers are planning to bring more ultra-low emission cars to market in the coming years, with fully electric and plug-in hybrid models likely to be the first to arrive. These vehicles can have significantly lower emissions of CO<sub>2</sub> and air pollutants than vehicles with conventional engines. Indeed the CO<sub>2</sub> benefits will increase as the energy sector decarbonises over time.

**3.23** Early on, these vehicles are likely to be substantially more expensive than their conventional counterparts. To create a more favourable market for both consumers and industry, in January 2009 we committed £250 million of funding for a new programme to support early adoption of electric and plug-in hybrid cars. In April 2009 we announced that the majority of this funding will be used from 2011 onwards to provide help worth in the region of £2,000 to £5,000 per vehicle towards reducing the price of qualifying cars.

**3.24** We will publish a further update on the details of this programme shortly. This includes proposed criteria to ensure qualifying vehicles are safe, reliable and perform well; the update will also include the short-listed options for delivering the incentive. We will work closely with industry on these options as we finalise our plans in the coming months.

### *Supporting infrastructure for low emission vehicles*

**3.25** As part of the same programme, £20 million, supplemented by up to a further £10 million from the Low Carbon Strategic Investment Fund, will be made available for electric vehicle charging infrastructure. Our aim is to help a relatively small number of lead cities or regions in the UK to establish themselves as forerunners in the trialling and adoption of this infrastructure. The money will be made available through a new scheme “Plugged-in Places”, to be operational from 2010.

- 3.26** This programme is aimed at larger initiatives; smaller vehicle infrastructure projects will also be eligible for support through the Department's Alternative Fuels Infrastructure Grant Programme. This will be open for applications to support electric, hydrogen and natural gas vehicle infrastructure projects and is being managed for the Department by Cenex<sup>25</sup>, who are running a series of information days across the country over summer 2009.
- 3.27** More details of our infrastructure support will also be included in our programme update. We will discuss these proposals with key stakeholders with a view to finalising them by the end of this year.

#### *Exploring other technologies to improve fuel efficiency*

- 3.28** By 2022 we expect to see much greater use of a range of road transport technologies that can deliver a host of additional benefits alongside reductions in emissions.
- 3.29** For example, we continue to invest substantially in new Intelligent Transport Systems technologies to help local authorities manage their road networks better. These can include, for example, traffic signal and bus priority controls. These technologies can support delivery against a number of policy objectives including congestion management, public transport priority and travel information. By improving journey times across networks these technologies can lead to reduced congestion and therefore CO<sub>2</sub> emissions and can make services more attractive for passengers.
- 3.30** Government is also committed to promoting, on a voluntary basis, intelligent information systems that are designed to monitor fuel consumption and manage vehicle speed. These can give rise to improvements in fuel efficiency, even though they may not have emissions reduction as their main focus.
- 3.31** Intelligent Speed Adaptation (ISA) is one form of co-operative intelligent information system. It is a technology which helps a driver to keep to the speed limit either by providing real time advice to the driver or by physically restricting vehicle speeds. Research by the Motorists' Forum and the Commission for Integrated Transport has shown that, in addition to safety benefits, ISA could deliver emissions reductions on roads with speed limits above 60mph.<sup>26</sup>
- 3.32** We have no plans to mandate ISA, but believe that it could, in future, be an attractive option to those who want to drive more cleanly and safely. The Government's April consultation document on a new road safety strategy,

<sup>25</sup> [http://www.cenex.co.uk/igp\\_index.asp](http://www.cenex.co.uk/igp_index.asp)

<sup>26</sup> Commission for Integrated Transport and the Motorists' Forum, *Speed Limit Adherence and its Effect on Road Safety and Climate Change*, <http://www.cfit.gov.uk/docs/2008/isa/index.htm>

*A Safer Way*<sup>27</sup> sets out the work which we are leading to support the future development of ISA applications in a number of ways:

- Developing and shortly publishing a voluntary framework for local authorities for use in collecting the electronic speed limit information which is needed for ISA to work;
- Funding a pilot advisory ISA project in Lancashire through the road safety partnership grant programme; and
- Continuing to build our understanding of how ISA might work in practice in future, including by monitoring the trial of ISA currently being rolled out by Transport for London.

## Road freight

**3.33** Decarbonising freight and logistics is a key part of our longer-term strategy, but the nature of the sector makes this particularly challenging. In the shorter-term to 2022 it will be vitally important for us to:

- Help industry move to lower carbon technologies for HGVs as well as vans; and
- Explore other technologies to improve fuel efficiency.



### *Moving to lower carbon technologies for HGVs and vans*

**3.34** Emissions from freight movements stem primarily from the road sector – HGVs represent 20 per cent and vans 11 per cent of total domestic transport greenhouse gas emissions.<sup>28</sup> Focusing our policies on reducing emissions from road freight therefore makes the most sense. In chapter 4, we explain how we are supporting the shift of freight from road to rail and water, which are generally more carbon-efficient modes for freight transport. But modal shift is appropriate only for certain freight movements. Since 68 per cent of all road freight movements (measured by tonnes lifted) are within the same region and have no viable mode shift option<sup>29</sup>, HGVs and vans will continue to play an important role in the transport of goods.

**3.35** We therefore need to consider what type of framework – regulatory, funding to support investment or best practice programmes – will help us effectively incentivise the uptake of lower carbon technologies particularly for HGVs.

<sup>27</sup> <http://www.dft.gov.uk/pgr/roadsafety/roadsafetyconsultation>

<sup>28</sup> National Atmospheric Emissions Inventory (IPCC categories)

<sup>29</sup> DfT, *Road Freight Statistics* (2007)

- 3.36** Reducing emissions from HGVs poses a specific challenge. The emissions from an HGV will depend on how the vehicle is pieced together for operational use, and will vary significantly depending on the engine, transmission and other automotive components used; on the cab and trailer design; and on the load being carried. Because so many different factors need to be taken into account, it is very difficult to produce robust carbon estimates for HGVs. Air quality emissions testing is currently done only on the engine, and CO<sub>2</sub> emissions figures for the engine in isolation provide little indication of the emissions from the complete vehicle into which it will be fitted.
- 3.37** Given these complexities, before developing any framework we need to gain a better understanding of the impact of different HGV technologies on overall carbon emissions, and which of these technologies has the potential to help reduce emissions from the HGV as a whole.

*Exploring other technologies to improve fuel efficiency*

- 3.38** Alongside this strategy, we are publishing the findings of a study of the carbon emissions and savings that can be achieved from a number of HGV technologies such as aerodynamic trailers, low rolling resistance tyres, and alternative powertrains including electric and hybrid vehicles, and alternative fuels.



- 3.39** Importantly, this study has helped identify which technologies have the greatest carbon saving potential for HGV operations.

## Review of low carbon technologies for HGVs

*Conducted for the Department by Ricardo.*

The CO<sub>2</sub> benefits from any lower carbon HGV technology need to be balanced with other considerations such as infrastructure requirements, costs of the technology, safety implications, and any limitations with respect to applicability across the range of HGVs and load types.

On this basis, those HGV technologies which offer the greatest potential for achieving CO<sub>2</sub> savings include:

- Aerodynamic trailers (average 10 per cent reduction in fuel consumption during normal operations);
- Low rolling resistance tyres (average 5 per cent reduction in CO<sub>2</sub> emissions);
- Electric bodies e.g. electrification of refrigeration and refuse bodies (reductions of 10-20 per cent in CO<sub>2</sub> emissions per year during operations);
- Automated manual transmissions (up to 7-10 per cent reduction in CO<sub>2</sub> emissions); and
- Fuel cell auxiliary power units (potential for significant CO<sub>2</sub> savings).

The following technologies also offer substantial CO<sub>2</sub> savings, but have limitations in the near-term, particularly around cost of the technology.

- Hybrids (fuel consumption reduction is up to 30 per cent but heavily dependent on duty cycle); and
- Fully electric vehicles, available for vehicles up to 12 tonnes (100 per cent tailpipe CO<sub>2</sub> reduction).

The full report can be found at: [www.dft.gov.uk/pgr/freight/research/](http://www.dft.gov.uk/pgr/freight/research/)

**3.40** This will place us in a good position to identify the level of uptake of these technologies needed to deliver significant carbon savings across the logistics sector and to consider what incentives or frameworks will help us achieve this uptake.

**3.41** The findings of the study will also allow us to contribute actively to wider discussions within the EU around CO<sub>2</sub> emissions from complete HGVs. There tends to be a tension between achieving the pollutant emission standards necessary for meeting our air quality targets and achieving fuel consumption and therefore CO<sub>2</sub> savings. This tension exists because of the design compromises that have to be made within the engine system. The Euro VI air quality emissions regulation, which will apply to all HGVs registered from December 2013, requires the European Commission to investigate whole-vehicle CO<sub>2</sub> emissions for HGVs. Our work on low carbon HGV technologies will allow us to play an influential role in these investigations and in the development of any future European proposals.

- 3.42** In addition, some operators suggest that permitting longer semi-trailers could cut their CO<sub>2</sub> emissions by around 10 per cent through use of fewer vehicles to move a given load.
- 3.43** Work is ongoing to consider the potential environmental, safety and economic benefits and impacts of introducing longer semi-trailers in the UK. This builds on previous research undertaken for the Department by Transport Research Laboratory into the scope for introducing longer and/or heavier goods vehicles onto UK roads. This found that the larger so called 'super-lorries' could lead to overall increases in CO<sub>2</sub> emissions, create serious implications for the management of the road network and introduce new safety risks. However, it also showed that there could be worthwhile benefits from permitting a modest increase in the length of current articulated HGVs.
- 3.44** The study is therefore focussing on the benefits and impacts of increasing the length of articulated HGVs by up to 2.05 metres, and will consider the overall CO<sub>2</sub> impacts (including if used by a wide range of operators) and the potential safety impacts.
- 3.45** We expect to complete the work during 2009. If the evidence shows significant overall CO<sub>2</sub> benefits (taking into account other impacts including those from modal shift) and acceptable safety implications, we will consult on proposed changes to regulations on vehicle length in 2010.

## **Buses**

- 3.46** Our aim is for public transport, including lower carbon buses, to play a growing role in our transport system. In addition to its positive impact on reducing congestion, the bus can offer a 'greener' way of meeting our transport needs than the private car. The fuel efficiency of buses is strongly influenced by load factors – the greater the numbers of people travelling by bus the lower the emissions per passenger. Our ultimate goal is for the radical decarbonisation of our entire public transport network. In the shorter-term, we are working to improve the overall environmental performance of the national bus and rail fleets.
- 3.47** For buses, our aim is to transform the fleet in two main ways:
- Encouraging fuel-efficient operation; and
  - Incentivising adoption of low carbon buses.

### *Encouraging Fuel-Efficient Operation*

- 3.48** We want to improve the fuel efficiency and reduce the emissions of buses by using our financial support for the bus industry to incentivise further technological change. Following a consultation, in December 2008 we announced a series of changes to the Bus Service Operators Grant (BSOG), which supports bus operators' fuel costs. These changes break the link between fuel used and subsidy paid.
- 3.49** From April 2010 operators that have improved their fuel efficiency by at least 6 per cent over the previous two years will receive a 3 per cent increase in their BSOG rate. Operators that do not deliver such improvements will have their rate frozen.
- 3.50** We are also working with stakeholders on more radical reform of BSOG, and exploring a subsidy system that is wholly unrelated to fuel consumption. Instead, this would be focussed upon key objectives, particularly climate change, encouraging modal shift from cars and improving accessibility. We aim to reach a firm conclusion on this by the end of the year.

### *Incentivising the Adoption of Low Carbon Buses*

- 3.51** Increasing fuel efficiency from existing buses is an important outcome, but we want to go further. We need to move, over time, to a greater penetration of hybrid, electric and fuel cell technology for buses, as with other road vehicles. Such technologies also bring benefits for local air quality.



- 3.52** There are already a number of hybrid buses on the market which can reduce CO<sub>2</sub> emissions by 30-40 per cent compared to conventional buses. But the high up-front costs of a hybrid bus in comparison with a conventional bus is hindering up-take.
- 3.53** We want to ensure this barrier can be broken down. From 1 April 2009 operators of low carbon buses (capable of emitting at least 30 per cent less greenhouse gases than a similar sized Euro III bus) will receive an additional 6 pence per km as part of BSOG. This level of subsidy coupled with the additional fuel savings delivered by hybrids, will provide a significant incentive for their purchase.
- 3.54** But we also want to go one step further, particularly in the current economic climate where funding for investments is difficult to source. We have announced a scheme to invest up to £30 million over 2009/10 and 2010/11 in low carbon bus technology. Bus operators will be able to apply for grants to contribute towards the additional up-front cost of buying a low carbon bus. We expect that this will lead to the delivery of several hundred new low carbon buses over the next two years and will provide further support to the UK bus operating and manufacturing industry.

### **Hybrid buses in London**

Transport for London have 56 hybrid powered buses in operation in the capital, most of which entered service relatively recently, and are in the early stages of trial operation involving a number of bus manufacturers. The additional capital and revenue cost of these vehicles is being funded by TfL.

It is envisaged that up to 300 hybrid vehicles will be in service through the tender process by 2011, depending on a number of factors including costs, funding and the operational outputs from the current trials. By 2012 the aim is that all new vehicles entering service will be hybrid.

- 3.55** Over time we expect the reform of BSOG, the grant scheme and other measures to make low carbon buses commercially viable – transforming the bus fleet and making local public transport more attractive.

### **Rail**

- 3.56** As with road transport, our vision for rail is based on technology improvements to reduce carbon emissions and deliver greater energy efficiency.
- 3.57** We are taking action in two key areas to deliver this vision:
- Encouraging better energy and carbon efficiency on the railways; and
  - Taking forward plans to electrify more of the rail network.

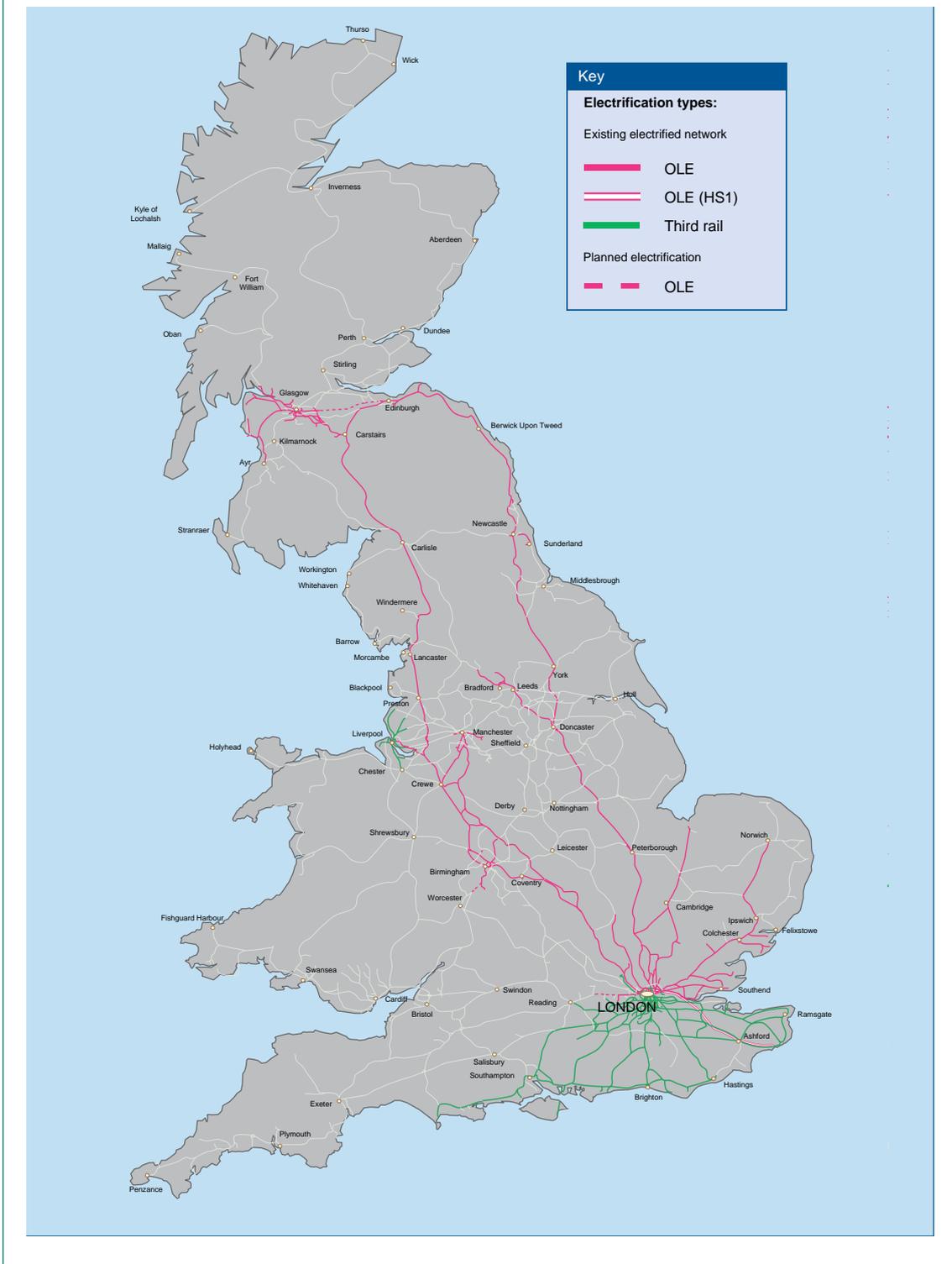
*Encouraging energy and carbon efficiency*

- 3.58** Our aim is for improved energy efficiency and reduced carbon emissions in rail operations, and we are supporting industry initiatives to deliver this. This includes the roll-out of regenerative braking on electric trains, trialling of biofuels and examining the potential for onboard and trackside energy storage. We are using the franchising process to encourage train operators to embed energy efficiency in their business and have committed to setting an environmental target for the rail industry in the next High Level Output Specification covering the period 2014-19.
- 3.59** Working with the rail industry, we are also improving the energy efficiency of new train designs. The new Super Express trains coming into service from 2014 will comprise an electric, self-powered (diesel), and a bi-mode variant, the latter being able to make use of an electric or a diesel power source at the end of the train. The Super Express trains will be cleaner, greener and generate less noise than the trains that they will replace. Despite being larger, the new trains will be up to 17 per cent lighter than their counterparts, meaning that they will be more energy-efficient and faster at accelerating. The diesel and bi-mode versions will benefit from the latest hybrid power technology which will reduce fuel consumption by up to 15 per cent.
- 3.60** In addition, the Department's specification for new diesel trains requires an improvement in overall energy efficiency of at least 15 per cent compared to existing designs.

*Taking forward plans to electrify more of the rail network*

- 3.61** Around 40 per cent of the national rail network is currently electrified. The existing electrified lines tend to serve the busiest parts of the network and consequently carry a greater density of traffic. Around 60 per cent of passenger journeys are made using electric trains.
- 3.62** In the period up to 2014 Network Rail is funded to deliver electrification from Barnt Green to Bromsgrove in the West Midlands. The Government has also announced that the Great Western Main Line between Airport Junction (near Heathrow Airport) and Maidenhead will be electrified as part of the Crossrail project.

Figure 3.4: Britain's existing electrified rail network



Source: Network Rail. Explanation of Key: OLE – Overhead Line Electrified, OLE (HS1) – Overhead Line Electrified (High Speed One), Third rail electrified.

- 3.63** Being able to replace diesel-powered trains with their electric counterparts has significant advantages. Electric trains offer better environmental performance, emitting between 20 – 35 per cent less carbon per seat kilometre than diesel equivalents on the basis of the current electricity generation mix.<sup>30</sup> This advantage will increase over time as our generation mix becomes less carbon intensive.
- 3.64** In addition, the use of regenerative braking enables many electric trains to re-use the energy that would otherwise have been lost when braking. This system, already in use on parts of the network, can reduce overall energy consumption and carbon emissions.
- 3.65** The benefits of electric trains go beyond the environment. They can increase capacity and reliability, as well as offering a more comfortable passenger experience. And, importantly, electric trains are significantly cheaper to buy, maintain and operate than diesels which can help to reduce the overall cost of running the railway.
- 3.66** Given the environmental and operational benefits of electrification and the opportunity it provides for reducing the cost of running the railway, there is a good case for electrifying more of the rail network. We have undertaken work to look at this case more closely and will shortly set out our plans for a major programme of rail electrification.



## Aviation & Shipping

- 3.67** For aviation and shipping our aim is to switch to progressively cleaner, greener aircraft and ships. We expect industry to drive and adopt technological improvements that will increase efficiency and reduce the environmental impact of these sectors. At the same time, we recognise that, even in the longer-term, the decarbonisation of aviation and shipping and the switch to alternative fuel sources will be more challenging than for road and rail modes.

<sup>30</sup> Rail Safety and Standards Board (2007), *Study on further electrification of Britain's railway network*, [www.rssb.co.uk/pdf/reports/research/T633\\_rpt\\_final.pdf](http://www.rssb.co.uk/pdf/reports/research/T633_rpt_final.pdf)

## Aviation

**3.68** Measures to achieve our 2050 target of bringing CO<sub>2</sub> emissions from UK aviation below 2005 levels fall broadly into two categories. Firstly, the use of market-based measures outlined in more depth in chapter 5, and secondly a combination of measures to drive the development and adoption of new technology, including:

- Fuel efficiency improvements in aircraft engines and airframes;
- Improvements in air operations, both in terms of more fuel-efficient practices and air traffic management;
- The use of alternative fuels, provided these can be produced sustainably.

### *Fuel efficiency improvements in aircraft engine and airframe technology*

**3.69** As a first step, we need to make maximum use of technological and operational improvements to improve fuel efficiency within the aviation sector. This will ensure that as a society, we continue to reap the social and economic benefits that air travel brings.

**3.70** Aviation is a safety-critical industry, with long lead-in times for technological developments, which have to meet exacting international standards. Aircraft have long life cycles compared to other forms of transport, typically over 30 years. As a result, there is less scope for the rapid uptake of technology improvements than in other modes such as road transport.

**3.71** Nonetheless, the cost of aviation fuel has provided a strong incentive to operators and manufacturers to increase efficiency. Improving the sustainability of aviation is a focus for research and development of UK aerospace companies, with a significant proportion of their research budgets dedicated to improving environmental technologies including fuel efficiency.

**3.72** This has led to significant changes over the last few decades in the efficiency of aircraft, which are today much more efficient than the first commercial jets. That trend is continuing, with new models about 20 per cent more fuel-efficient per passenger kilometre than those they will replace.<sup>31</sup> Radical changes to



<sup>31</sup> [http://www.rolls-royce.com/reports/environment\\_report\\_07/innovation/aerospace.html](http://www.rolls-royce.com/reports/environment_report_07/innovation/aerospace.html)

aircraft engines are also currently being developed for the next generation of single aisle aircraft, which could offer fuel savings of up to 20-30 per cent compared to the types they replace.<sup>32</sup>

### **Cleaner aircraft engines**

The Advisory Council for Aeronautical Research in Europe (ACARE) has set targets for aircraft manufacturers to bring forward technologies to reduce CO<sub>2</sub> emissions by 50 per cent (per passenger kilometre) for a new aircraft produced in 2020 compared to a similar one produced in 2000. This improvement will result from a combination of improvements in engines, airframes and air traffic management.

Within the UK, the engine manufacturer Rolls-Royce has already made progress towards developing engines that meet the ACARE targets. It is a leading player in a £95 million UK-funded Environmentally Friendly Aircraft Engine (EFE) programme, and is also a participant in the €1.6 billion EU-wide Clean Sky Joint Technology Initiative (JTI).

A number of new engine designs are currently under development both within the UK and the US, which could be in service within the next decade and have the potential to reduce fuel consumption by up to 30 per cent. These include new advanced fan engines involving geared turbofans, and more radical open-rotor engines, which offer the potential for significant fuel-efficiency improvements provided noise and integration issues can be addressed.

- 3.73** We are taking action in the following areas to encourage and promote the uptake of more fuel-efficient aircraft technology:
- We will continue to push for tougher environmental standards for new aircraft. The UK has led discussions to develop an international standard for aircraft fuel efficiency, and has played a part in securing international agreement to a goal of increasing aviation's fuel efficiency by 2 per cent each year to 2050.
  - In addition, our participation in the EU Emissions Trading System, along with other market-based measures will also help drive improvements in greener aircraft and operations.
  - Through our target to reduce emissions from UK aviation below 2005 levels by 2050 we have set a challenge to the aviation industry to innovate and adopt new more fuel-efficient technologies. A number of UK-based airlines have already adopted stretching fuel efficiency targets, and we will be encouraging others to follow suit.
  - We will continue to support and encourage manufacturers to develop low carbon engines and airframes. For example, we currently provide tax relief of 130 per cent on research and development investment in the UK

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<sup>32</sup> *Integrated study of advanced open rotor powered aircraft*  
<http://www.omega.mmu.ac.uk/integrated-study-of-advanced-open-rotor-powered-aircraft.htm>

to encourage companies to undertake environmental research, and provide funding for a number of research programmes.

### *More fuel-efficient operations*

- 3.74** As with technological improvements, more efficient operations offer the prospect of a “win-win”, with the potential of both CO<sub>2</sub> savings and cost savings arising as a result of lower fuel consumption. They also have the benefit of improving the whole fleet’s performance quickly unlike some aircraft technology that takes longer to feed through. There are three main categories of operational improvement available: those achieved by airlines through better working practices, those achieved through airport operations, and improvements made through more efficient air traffic management.
- 3.75** Improvements to working practices include measures such as better flight planning, speed management, matching of aircraft to tasks and weight reduction. In terms of airport operations, the movement of aircraft between gate and runway can be improved to reduce taxiing, waiting and stop-start movements. Terminal operations can also be improved through a range of measures including redesigned terminal buildings, reducing heating and cooling demand, and innovative thinking to facilitate better access by staff and passengers using public transport.
- 3.76** Air traffic improvements are especially challenging to achieve as they require international co-ordination across the industry as a whole. Nonetheless, estimates from the European Commission suggest improvements in air traffic management, allied to those in airport operations, could achieve reductions in emissions per EU flight in the range of 7-12 per cent by 2020, mainly as a result of more direct routes and reduced delays<sup>33</sup>. The National Air Traffic Services (NATS) has set itself a target of cutting CO<sub>2</sub> emissions from aircraft under its control by 10 per cent per flight by 2020 on average against a 2006 baseline.<sup>34</sup>
- 3.77** We will continue to take action in a number of areas to promote more sustainable operations:
- We will encourage the Civil Aviation Authority (CAA) and NATS to develop and incentivise more fuel-efficient air traffic management services, both within UK airspace and with our international partners through implementation of the Single European Sky and NextGen programmes<sup>35</sup>.
  - We will encourage the identification and dissemination of fuel-efficient practices, provided these can be guaranteed to be safe.

<sup>33</sup> *Single Sky II Communication* June 2008.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0389:FIN:EN:PDF>

<sup>34</sup> *NATS Environment Plan* [www.nats.co.uk/uploads/NATSEnvironmentPlan\(1\).pdf](http://www.nats.co.uk/uploads/NATSEnvironmentPlan(1).pdf)

<sup>35</sup> Federal Aviation Authority website. <http://www.faa.gov/about/initiatives/nextgen/defined/>

## Shipping

- 3.78** As with aviation, we are looking to the shipping industry to exploit the full potential of technology to improve fuel efficiency and reduce emissions, while recognising that a switch to alternative fuel sources will be a challenge.
- 3.79** Historically, shipping has offered relatively high efficiency in terms of the amount of CO<sub>2</sub> per freight tonne transported. Shipping represents 7 per cent of all greenhouse gas emissions from UK domestic and international transport.<sup>36</sup> However, this proportion will grow as other modes of transport decarbonise over time and as the increase in demand for global trade continues.
- 3.80** For shipping, we are:
- Working within the International Maritime Organization (IMO) on technical and operational measures to reduce CO<sub>2</sub> emissions from ships; and
  - Driving international action through the IMO and UN Framework Convention on Climate Change (UNFCCC) to ensure shipping plays its part in reducing emissions.

### *Working internationally on technical and operational measures to reduce CO<sub>2</sub> emissions from ships*

- 3.81** We are working to achieve agreement in the Marine Environment Protection Committee of the IMO on technical and operational measures.
- 3.82** These measures include an Energy Efficiency Design Index (EEDI) for new ships, which would rate ship designs on their energy efficiency – allowing ship owners to choose the most energy-efficient ship.
- 3.83** We are also working within the IMO on a voluntary Energy Efficiency Operational Index for current ships, and a range of voluntary operational and technological improvements. Measures being discussed at the IMO by countries and environmental and industry non-governmental organisations include harnessing wind power, alternative fuels, and reduced speeds to reduce the environmental impact of the sector.

### *Driving international action to reduce shipping emissions*

- 3.84** Shipping, like aviation, is a global industry, and so we are working with our international partners and within international forums, such as the IMO and UNFCCC to drive action to reduce emissions from the sector.

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<sup>36</sup> National Atmospheric Emissions Inventory 2007

- 3.85** The UK is pushing for maritime emissions to be included in any global deal agreed at Copenhagen in December. We believe that international shipping should be set a global sector-level target.
- 3.86** We will also work with international bodies, including the IMO to explore a new convention to deal with greenhouse gas emissions from ships through an economic instrument such as an emissions trading scheme at a global level.
- 3.87** Until a truly global solution can be found, or should progress within the IMO prove too slow, we will continue to look at other options, notably those proposed at EU level, such as to include shipping emissions in the EU Emissions Trading System.

### **Sustainable biofuels**

- 3.88** We are committed to ensuring that transport fuels are cleaner, greener and less carbon intensive. Biofuels are blended into the conventional transport fuels that we use today and therefore are a readily available renewable technology. They have the potential to emit 338-371 million tonnes of global CO<sub>2</sub> less each year than the fossil fuels they replace.<sup>37</sup> However, the 2008 Gallagher Review found that unless produced in the right manner, with appropriate crops, biofuels risk displacing existing agricultural production, which in turn may drive deforestation and the loss of biodiversity and ecosystem services. This could cause both an increase in net greenhouse gas emissions (above those associated with conventional fossil fuels) as well as contributing to higher food prices and food shortages.



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<sup>37</sup> [http://www.dft.gov.uk/rfa/\\_db/\\_documents/Report\\_of\\_the\\_Gallagher\\_review.pdf](http://www.dft.gov.uk/rfa/_db/_documents/Report_of_the_Gallagher_review.pdf)

**3.89** Promoting the use of sustainable biofuels is therefore an important part of our strategy to deliver a low carbon transport system. A sustainable biofuel is one that delivers high greenhouse gas savings and low social and environmental impacts. We are taking action in two main areas to support this:

- Using regulation to promote sustainable biofuels; and
- Supporting innovative research into new biofuels.

#### *Using regulation to promote sustainable biofuels*

**3.90** Long-term targets, set in law, are an important mechanism for ensuring development of the best biofuels. They guarantee likely demand and provide certainty to industry which, in turn, encourages innovative investment in new biofuels.

**3.91** Regulations can also prevent unsustainable biofuels from being produced and consumed through minimum sustainability standards. In light of this, we have signed up to two ambitious targets under the European Renewable Energy and Fuel Quality Directives. Both contain binding mandatory sustainability standards for biofuels. Accordingly we want to deploy the most sustainable and cost-effective biofuels available by 2020 to:

- Reduce greenhouse gas emissions from transport fuels by 6 per cent; and
- Ensure that 10 per cent of transport's energy comes from renewable sources<sup>38</sup>.

**3.92** We will be putting new laws in place to meet these targets by December 2010. The existing Renewable Transport Fuel Obligation<sup>39</sup>, will need to be amended or superseded to comply with European law.

**3.93** The *UK Renewable Energy Strategy* (published in parallel with this strategy) sets out a range of scenarios for how much biofuel we will be using between now and 2020.<sup>40</sup> We will firm up these proposals in a National Action Plan, which we will be publishing in June 2010.

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38 By the end of 2014 the Commission will undertake a review of, amongst others, the cost-efficiency of the measures to be implemented to achieve the target and the feasibility of meeting the target sustainably.  
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0016:0062:EN:PDF>

39 The Renewable Transport Fuel Obligations Order 2007 obligates fossil fuel suppliers to show that a certain percentage of their fuel comes from renewable sources. The obligation level will rise annually in stages until we reach a level of 5 per cent renewable fuel in 2013/14.

40 [http://decc.gov.uk/en/content/cms/what\\_we\\_do/uk\\_supply/energy\\_mix/renewable/res/res.aspx](http://decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/res/res.aspx)

*Supporting innovative research into new biofuels*

- 3.94** Setting minimum greenhouse gas savings will help to improve biofuel sustainability. Yet there is more that we want to do to encourage the supply of the right kind of biofuels in the UK which generate genuine net greenhouse gas savings. That is why we are developing a comprehensive cross-government research and development strategy on sustainable biofuels. The strategy will be informed by a research scoping study that is due for publication in summer 2009.
- 3.95** Our research strategy will complement existing innovations. For example, in January 2009, the Biotechnology and Biological Sciences Research Council's Sustainable Bioenergy Centre was launched to target research into the development of advanced bioenergy, representing a £20 million Government investment. The Department is also providing up to £6 million to the Carbon Trust's Advanced Bioenergy Directed Research Accelerator, which is investigating the potential of algae for biofuels.
- 3.96** The Government intends to provide financial support for the creation by industry of a biofuels demonstration plant in England, which would use organic waste material to produce bioethanol and renewable power. Further details are expected to be announced later this year.
- 3.97** Our research will also feed into current efforts by the European Commission to understand and, if appropriate, create a methodology to account for indirect land-use change. We believe that this is important for securing long-term investor certainty and public confidence in the biofuels industry.
- 3.98** There may also be significant potential for biofuels to be used in aviation. There has been a considerable amount of research in this area. For example, the use of drop-in biofuels, which provide an equivalent replacement for kerosene, have already been tested on commercial airliners, and the results are encouraging, suggesting that they may not require modifications to use. Manufacturers such as Boeing have suggested that biofuel-powered aircraft could be certified for commercial use within the next three to five years, with blends of up to 30 per cent being commercially feasible. However, as there is only a limited availability of biofuels we will need to have a coherent strategy for utilising their sustainable deployment both in the air and on land.
- 3.99** We will continue to work with other governments to encourage and promote the use of sustainable biofuels within the aviation sector, and to ensure that issues relating to their supply can be overcome.



# Chapter 4

## Promoting lower carbon choices



## Promoting lower carbon choices

- 4.1** Technology measures are important in reducing transport emissions, but they are not enough on their own. We also need to think about the choices that we, as individuals and businesses, make on a daily basis about when, where and how to travel and transport goods.
- 4.2** For some users of transport, lower carbon options may already be attractive. For example, measures such as shifting freight from road to rail can be competitive for business whilst reducing congestion and emissions. Policies that encourage people to take public transport or walk and cycle can bring these benefits too, as well as enhancing the local environment and supporting healthier lifestyles.
- 4.3** But for those with access to a car, their convenience and comfort is undeniable. In the commercial world, direct delivery by van or lorry is an everyday fact of life. Reducing emissions from all these journeys can be achieved through a combination of new low carbon technologies, different patterns of travel and new approaches to logistics.
- 4.4** There are opportunities for action at many levels. Individuals' choices about whether and how to travel have a significant cumulative impact on transport demand. So too do the decisions of businesses – from the ways in which they choose to manage their supply chain, to their actions as employers, service providers and retailers.
- 4.5** Government also has an important role to play. At a national level we seek to influence transport choices by providing strategies, guidance and information; as well as by setting technical standards or directly funding services. Local authorities and regions have considerable influence over the way we travel, through direct delivery of transport services as well as through their decisions on strategic planning, or on the locations of business and homes. And as large employers, both national and local government can take the lead in reducing emissions from their own estates and operations.

It is notoriously hard to predict long-term changes to lifestyles and preferences. Wider trends, including demographics, energy prices and economic growth will all have an impact on travel and transport patterns. These transport patterns may need to change over time if we are to meet our climate change obligations alongside our other transport objectives such as economic prosperity and equality of opportunity for all citizens.

We need to understand what options are available for changing the way we use transport in the longer-term. And we must do more to realise the contribution that local authorities and regions can make to our carbon reduction goals.

In particular, there are important actions that we can take now to reap the benefits of using our current transport system in a more efficient way and promoting lower carbon choices within modes.

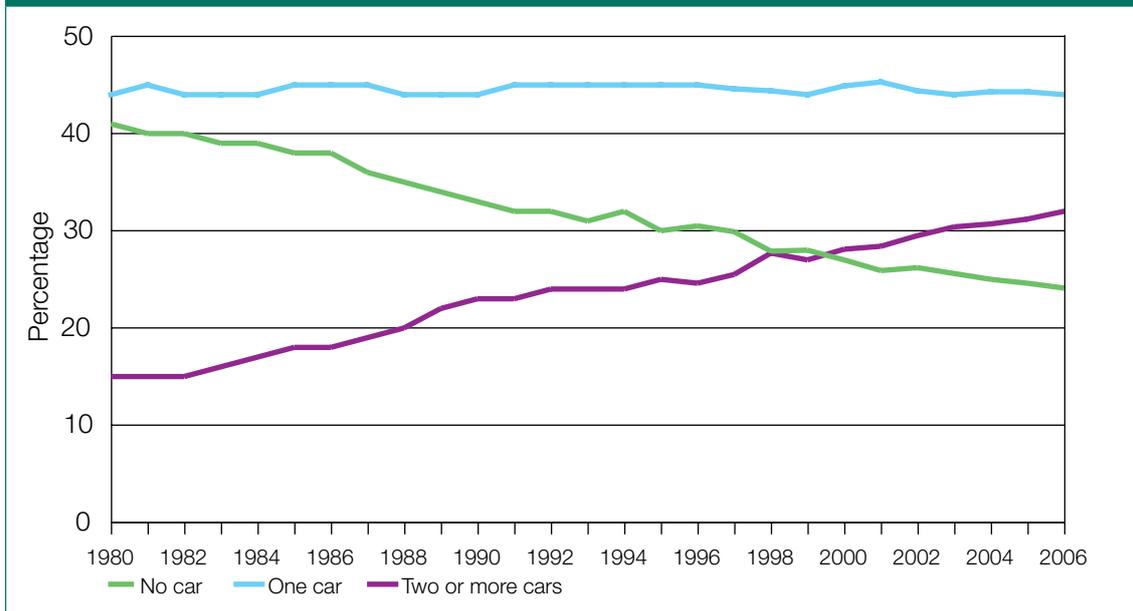
Our strategy to 2022 is to support individuals and business in choosing lower carbon transport options.

- Modern, low carbon public transport will be more accessible, attractive and easy for passengers to use.
- With the help of regional and local partners more integrated travel schemes will be in place to encourage sustainable travel, including active modes such as cycling and walking.
- New information and advice, delivered in innovative ways, will be available that encourages lower carbon transport choices and use.
- There will be a greater shift to lower carbon transport for goods and services.

## The challenge

- 4.6** For many of us, our lifestyles are built around the car and our propensity for owning them continues to grow. As Figure 4.1 shows, for around the last ten years, more households have had access to two or more cars than those without a car.

**Figure 4.1: Households have access to more cars**



Household access to a car: 1980 to 2006, Great Britain  
 Source: *Transport Trends*, Department for Transport

- 4.7** Encouraging a switch to lower carbon transport options will require these to be attractive and competitive in meeting business and personal needs. For businesses in particular this means finding a way of ensuring that lower carbon transport is consistent with commercial priorities. For individuals this may mean changing long-established travel habits.
- 4.8** But research also shows that transport behaviours are amongst the most difficult to change – there are strong links between transport and people’s lifestyle choices. Some people see little reason to make greener transport choices. This could be due to a number of factors, such as not having access to, or being aware of, the lower carbon options available.<sup>41</sup>

**Our attitudes to transport and climate change**

Survey evidence suggests that public awareness of the term ‘climate change’ is almost universal and concern about climate change is high across the population.

In light of these concerns, many people have indicated a willingness to change their travel behaviour, such as reducing the amount they travel by car. However, this is a complex area. The evidence also demonstrates that there is a particular resistance to changing behaviours considered to constitute a significant lifestyle change – of which transport is one.

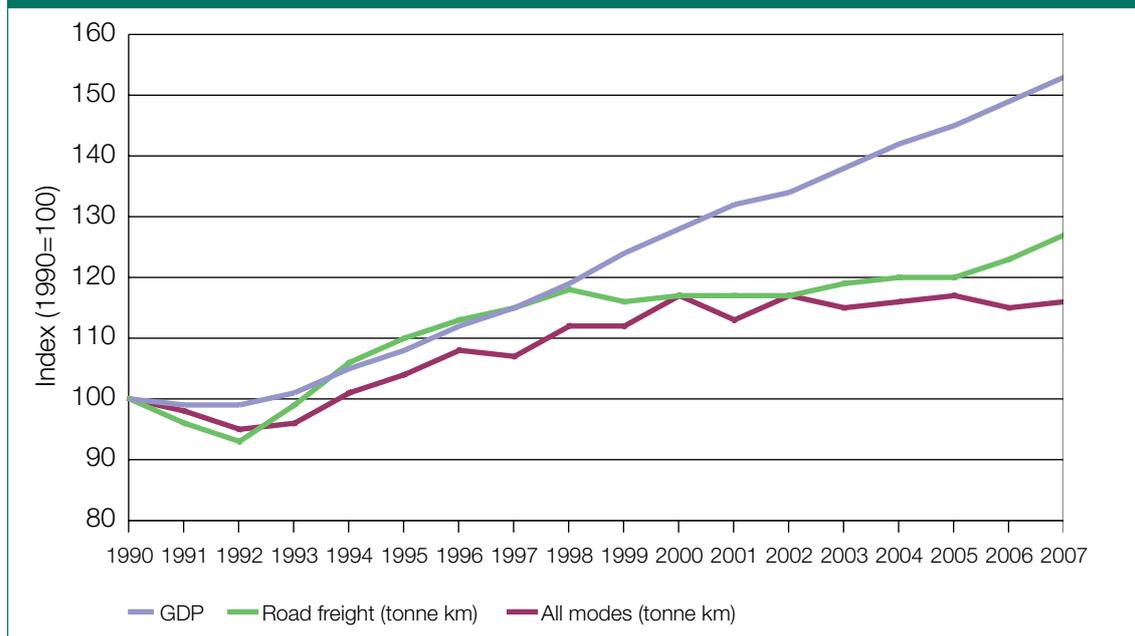
Findings from a major study on this topic were published in January 2009, with further work underway to support future policy development. More detailed research findings are available at:

<http://www.dft.gov.uk/pgr/scienceresearch/social/>

<sup>41</sup> <http://www.dft.gov.uk/pgr/scienceresearch/social/>

- 4.9** Many sustainable travel initiatives are cost-effective and fit well with other transport and social policy goals such as reducing congestion, improving air quality, health and quality of life. However, determining emissions savings from ‘softer’ policy measures is complicated and uncertain. These measures can be hard to assess and their effects may fade over time. The challenge is to find ways of making such changes stick.
- 4.10** Guidance and funding from the Department to the regions and local authorities is part of a wider picture of decision making that takes account of more than just transport objectives. We must ensure that these decisions lead to a greater contribution to carbon reduction whilst delivering on other local priorities.
- 4.11** Freight tonnage continues to increase in absolute terms but since the late 1990s greenhouse gas emissions from this activity have grown more slowly than GDP as shown in figure 4.2. But freight activities are still responsible for around 30 per cent of transport emissions.<sup>42</sup>

**Figure 4.2: The link between UK GDP and freight growth began diverging around 10 years ago**



Source: *Transport Statistics Great Britain 2008* and Office for National Statistics

<sup>42</sup> Source: DfT analysis of National Atmospheric Emissions Inventory

## Taking action to turn our vision into reality

### Providing lower carbon public transport alternatives

**4.12** Our aim is to make public transport an accessible, attractive, low carbon and easy-to-use option for individuals and business. We will continue to provide financial support to the rail and bus sectors.

#### *Rail*

**4.13** Rail is an excellent lower carbon option for an increasing number of travellers, and increasing the availability of rail services, including in future high speed rail connections, increases choice for passengers. Passenger numbers have grown by some 50 per cent in the last ten years.<sup>43</sup> Further growth is expected, with potentially twice as many passengers using the railway over the next thirty years.<sup>44</sup> To cope with these rising passenger numbers, over £10 billion will be invested in enhancing capacity between 2009 and 2014, with overall Government support for the railways over this period totalling £15 billion.

**4.14** We are also committed to improving the performance of the railways. In January 2009 rail performance reached its highest level since the current measure was established eight years ago, with over 90 per cent of trains arriving on time. Rail punctuality and reliability has improved by over 10 per cent in the last five years.<sup>45</sup>

**4.15** Rail may provide further opportunities to reduce emissions from journeys between cities. A new company, High Speed Two, is advising the Government on the case for high speed rail services from London to Scotland. The company will report by the end of 2009 on the prospects for a new line between London and the West Midlands, and will provide advice on potential development beyond the West Midlands at the level of broad “corridors”. This work will consider in particular the potential for extending this further to Greater Manchester, West Yorkshire, the North East and Scotland. Evidence suggests that improving the quality and reliability of rail encourages travellers to switch from other modes. On the West Coast Main Line for example, aviation’s share of Manchester to London traffic has fallen from half in 2003 to around one third today.

**4.16** Similarly, investment in the high speed railway line ‘High Speed One’, running from St. Pancras in London to the Channel Tunnel, has encouraged more people to travel to Europe by train. In future, an increasing number of European cities will become accessible by train, offering genuine choice to passengers. While we recognise that rail journeys will not replace all short haul flights and cannot replace long distance flights, there is increasing

43 DfT (2009) *Britain’s Transport Infrastructure: High Speed Two*, <http://www.dft.gov.uk/pgr/rail/pi/highspeedtwo/>

44 DfT (2007), *Delivering a Sustainable Railway*, <http://dft.gov.uk/about/strategy/whitepapers/whitepapercm7176>

45 Office of Rail Regulation, *National Rail Trends*, <http://www.rail-reg.gov.uk/server/show/nav.1528>

scope over the next twenty years for passengers to travel by train rather than plane.

## **Buses**

- 4.17** Over the last ten years bus use in England has grown by more than 17 per cent and investment in bus services has more than doubled to around £2.5 billion a year<sup>46</sup>. Chapter 3 explains in more detail how we are developing our system of subsidy for buses to encourage greater fuel efficiency, as well as providing support for the introduction of new greener technology into the bus fleet.
- 4.18** We are also committed to improving access to these services through the England-wide mandatory bus concession. This concession guarantees free travel on local buses during off-peak hours for older and disabled people throughout England (the Devolved Administrations also have similar schemes). We want to ensure that bus travel, in particular, remains within the means of those on limited incomes and those who have mobility difficulties. This supports our wider work to tackle social exclusion.

## *Promoting the integration of transport modes*

- 4.19** Better coordination and integration of different services will improve the attractiveness and convenience of public transport and can encourage modal shift. For this reason we are keen to promote the use of smart ticketing, which not only provides convenient and cash-less travel but also allows passengers to move seamlessly between modes. The success of the Oyster card in London has shown what can be done, and we are supporting initiatives to deliver the same kind of flexibility and convenience all across the country. New technology means that these tickets could be linked to real time travel information, with the possibility in future of mobile phones being used as tickets.
- 4.20** We are continuing to support and sponsor the development of an ‘open’ smart ticketing specification, known as ‘ITSO’, and ensuring that it is a requirement in new rail franchises. For buses, the reform of the Bus Service Operators Grant (BSOG) will include paying more grant money to bus companies that have operational smart ticketing. In the summer we will consult on a strategy to increase and speed-up the roll-out of smart and integrated ticketing across England.

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<sup>46</sup> *Public Transport Statistics Bulletin: Great Britain 2008* edition. This figure includes local authority capital expenditure on bus infrastructure.

**4.21** The Rail White Paper *Delivering a Sustainable Railway* recognised the strong synergy between cycle and rail which, when used in conjunction, provides one of the most environmentally friendly options for travel to work<sup>47</sup>. While some 60 per cent of the population lives within a quarter of an hour cycle ride of a railway station,<sup>48</sup> only 2 per cent of journeys to and from stations are made by bike<sup>49</sup>. As a result, the Cycle Rail Integration Task Force was established with the aim of improving the provision for cycling to and from stations, enhancing cycle storage facilities at stations and promoting best practice. In April 2009 the Task Force launched a £3 million Challenge Fund to improve bike and rail integration and to challenge Train Operating Companies and rail operators to improve cycle facilities across their franchises.



**4.22** To underline further the importance of better integration of cycle and rail, the Department announced in June an additional £5 million programme over two years for transformation projects to improve cycling storage facilities at up to ten major railway stations nationwide, including in London.

### **Leeds Cycle Point**

Northern Rail is in the process of developing a major new cycle facility at Leeds station based on experience and good practice from the Netherlands.

The aim of this pilot scheme is to reduce congestion and CO<sub>2</sub> levels, improve health and increase the use of rail. Cycle Point will be a staffed facility offering customers a safe, dry, clean and convenient location to store their bikes. It will also incorporate a range of cycle services such as sales, repair and rental.

If approved, the new Cycle Point should be open to the public in spring 2010. The Cycle Point initiative will be complemented by the award of £1 million grant to Northern Rail by the Cycle Integration Task Force to further improve bike and rail integration at their stations.

<sup>47</sup> DfT *Delivering a Sustainable Railway* 2007 <http://www.dft.gov.uk/about/strategy/whitepapers/whitepapercm7176/>

<sup>48</sup> DfT and the Countryside Agency (2004) *Bike and Rail: A Good Practice Guide*

<sup>49</sup> National Travel Survey

## Promoting other sustainable modes

### Cycling

**4.23** Cycling is a viable alternative to car journeys for many short trips although we recognise that it will not meet the needs of all travellers or journeys. More than half of all trips are 5 miles or less, accounting for approximately a fifth of household car emissions (see figure 2.7, chapter 2). As well as reducing emissions, cycling can bring additional benefits for health, reduced congestion on our roads and improved local air quality, making our towns and cities more pleasant places to live.

**4.24** We are investing in measures to promote and support cycling across the country, by:

- Providing investment and support to 18 Cycling Demonstration Towns and Cities; and
- Giving children the skills and confidence to cycle through Bikeability training.

**4.25** Through our cycling demonstration programme we are investing nearly £50 million over three years in 18 towns and cities across England. This investment is matched by the local authorities. As a result, these locations benefit from cycling funding more akin to levels of investment per head of population in other European countries.

**4.26** The demonstration programme is designed to show the benefits of investment in cycling to other local authorities. We expect other towns and cities to learn from this experience and encourage cycling through their own transport plans.

**Figure 4.3: The cycling demonstration towns and city**



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Source: DfT

### **Cycling demonstration in Exeter**

Exeter was awarded Cycling Demonstration Town status in 2005. In 18 months Devon County Council created 16 kilometres of cycle routes in addition to its existing 50 kilometre network.

With routes progressing well, the town encouraged cycling take-up among pupils and workers. Some schools are now reporting upwards of 20 per cent of trips by bike on a regular basis. Exeter has also been engaging businesses with cycling: 9 per cent of employees are now cycling regularly to work, compared to 4 per cent in the 2001 national census.

The Exeter Cycling Town programme for 2008-11 will extend the project into outlying areas, creating links to nearby communities and the local countryside.

Full details at <http://www.devon.gov.uk/cycleexeter.htm>

**4.27** There is still a great deal more to be done in order to realise the contribution that cycling can make to a low carbon and healthier future. By the end of 2009, we will develop a comprehensive National Cycle Plan to further promote cycling as a mainstream form of personal transport. We will also build on the joint working already underway with Department of Health to complement this with a new active transport strategy, to develop plans to encourage low carbon transport options that also promote personal health and wellbeing.



**4.28** We also need to maximise the contribution of wider schemes to promote cycling. For example, Connect2 is funded by a £50 million Big Lottery Fund grant after the UK public voted the scheme the winner of the People's Millions Lottery contest. It is a nationwide project aimed at creating dedicated, high quality local walking and cycling networks, benefiting an estimated 6 million people across the UK. Interventions in the scheme include building foot or cycle bridges over rivers or railways, linking up existing traffic-free paths or creating new links to the National Cycle Network. These are designed to overcome long-standing barriers that are dividing communities and making it difficult for people to travel by foot or bike as part of their everyday lives.

**4.29** We are promoting 'Bikeability', a National Standard for cycling training. This is designed to give the next generation the skills and confidence to ride their bikes on today's roads. We intend to make National Standard Bikeability

training available to 500,000 additional children by 2012, over and above that already delivered by local authorities. We are well on course to deliver this target having already funded around 146,000 additional training places.

### *Sustainable Travel Towns and Cities*

- 4.30** Sustainable travel initiatives are a key way for regions and local authorities to contribute to our climate change goals.
- 4.31** Our Sustainable Travel Towns programme has pioneered this approach. It includes a combination of travel planning, improved information, marketing of options, organising services to address local needs, and providing new services focused on particular places (such as workplaces or developments). This approach can also cover reducing the need to travel at all, for example by tele-working and tele-conferencing.
- 4.32** Over five years from 2004 to 2009, the three Sustainable Travel Towns – Darlington, Peterborough and Worcester – have seen reported car trips fall by up to 9 per cent, walking increase by up to 14 per cent, and cycling increase by at least 12 per cent<sup>50</sup>. Following this success, in May 2009 we announced that large urban areas across England are being given the chance to bid to become the country's first Sustainable Travel City. Up to £29 million will be invested over three years to ease congestion, reduce CO<sub>2</sub> emissions and increase levels of physical activity in the local area.

#### **Sustainable Travel Town: Peterborough**

Between 2004-2009 Peterborough City Council rolled out their “Travelchoice” programme across the city with the help of funding from the Department.

They used personalised travel planning, better travel information, school and business travel plans and a range of city-wide events and promotions to engage with their community and provide what they need to make informed decisions about how they travel.

Travel diaries from local people showed that as a result, there was a 9 per cent reduction in car driver trips, and big increases in walking (14 per cent), cycling (12 per cent) and bus use (35 per cent) over the 5 year period.



<sup>50</sup> <http://www.sustrans.org.uk/about-sustrans/media/news-releases/car-use-down-in-english-towns>

- 4.33** We know that it is hard for people to change their travel patterns permanently, so we will ask the bidding cities to develop innovative measures to ‘lock in’ the benefits of changes in travel choices to increase the prospects for long-term change.
- 4.34** The city or cities will provide a model for other cities to follow. We expect local authorities across the country to adopt many of the measures trialled when developing their own approaches to local transport.

### **Further work with partners in regions and local authorities**

- 4.35** Central government cannot work alone in promoting lower carbon choices. The complexity of the challenge means that government must seek to work with all those who have influence over travel choice. Regions and local authorities are particularly important partners in influencing the pattern of journeys and development. Most journeys are short, and almost all take place at least in part on infrastructure or services which are the responsibility of local authorities.
- 4.36** We are therefore supporting regions and local authorities to make the maximum contribution to our climate change goals by:
- Spreading skills and best practice; and
  - Incentivising delivery.

### *Spreading skills and best practice*

- 4.37** Many local authorities have built up skills and experience in tackling emissions, and more are keen to do so. We have listened to regional and local colleagues who have told us they need more tools, guidance and information to assist them in bringing forward sustainable transport schemes; and to help them understand better the CO<sub>2</sub> impacts of different policy measures. To this end, we are now taking action to:
- Develop analytical tools to support more effective assessment and appraisal of transport carbon impacts at a regional and local level. Revised guidance on assessing impacts has already been included in Webtag<sup>51</sup> and we are exploring how best to provide simple tools for assessing relatively small proposals. We will continue to promote best practice with local bodies, encouraging the use of good quality evaluations.
  - Open up our data sources to both regions and local authorities. In March 2009 we published regional databooks covering all elements of the Department’s strategic goals, highlighting “hotspot” areas for emissions as well as journey purpose information<sup>52</sup>.

51 WebTAG (<http://www.dft.gov.uk/webtag/>) is DfT’s guidance on the appraisal of transport projects and on scoping and carrying out transport studies.

52 <http://www.dft.gov.uk/pgr/regional/strategy/databook>

- Support knowledge and best practice sharing. We will continue to promulgate best practice in transport delivery. In autumn 2009 we intend to publish thematic guidance on ways to reduce CO<sub>2</sub> through sustainable travel measures. This will form part of the suite of support available to local authorities as they develop new Local Transport Plans by April 2011.

### *Incentivising delivery*

- 4.38** We will finalise guidance for local authorities on the development of Local Transport Plans. This will emphasise the importance of reducing transport emissions as well as delivering on other transport goals.
- 4.39** But guidance from the Department forms part of a much wider picture. Local Area Agreements are the main vehicle through which government departments agree priorities for improvement with individual local areas led by local authorities. Around 100 local authorities have already made CO<sub>2</sub> reduction a priority by opting to set a target on the basis of National Indicator 186 which includes transport components.
- 4.40** There have been calls to strengthen the ways in which we incentivise authorities to reduce emissions from transport. There has been interest for example, in the possibility of a ring-fenced funding stream to support carbon reduction from transport.
- 4.41** However, in order to maximise the impact of local action in carbon reduction, the choices which need to be influenced are not only those from transport, but the whole range of local services, planning and decisions, in a joined-up way. That is why we would like to see action to reduce carbon emissions being further prioritised in Local Area Agreements.
- 4.42** The next round of Local Area Agreements is expected to be in place by April 2011. We will be working closely with other departments to ensure both that the framework gives sufficient emphasis to reducing emissions and that individual authorities are encouraged to set sufficiently demanding targets.
- 4.43** As part of our work on longer-term strategy, the Department is inviting regions to identify their transport challenges and priorities for responding to them. This will provide an important opportunity for regions to identify their carbon reduction challenge and potential solutions.

**4.44** In our major cities, where the greatest challenges and opportunities for carbon reduction are likely to arise, powers made available in the Local Transport Act 2008 will help to achieve the strong leadership which these challenges demand. We are working with most major cities on Multi Area Agreements to ensure that transport and climate change policies are planned as part of wider programmes. Leeds and Manchester have been selected as forerunner city regions and have put forward plans for more radical change in their areas.

#### **Promoting change in individual travel choices through better information**

**4.45** We recognise that for many people, especially outside our larger towns and cities, public transport will struggle to provide the same convenience as the car, and for other journeys walking and cycling will not always be practical options. Therefore, we want to ensure that people with access to a car have the information that they need to use it efficiently and in the most environmentally friendly way possible.

**4.46** In order to reduce the impact of these journeys we are:

- Providing information through the ACT ON CO<sub>2</sub> campaign and promoting the use of travel planning across a wide range of transport modes;
- Promoting eco-driving techniques to new and existing drivers; and
- Encouraging in-car technologies that support eco-driving.

#### *Providing information*

**4.47** ACT ON CO<sub>2</sub> is a cross-government campaign that provides information about climate change, and advice to consumers about easy, achievable ways in which they can reduce their carbon footprint through everyday activities. For transport, this includes steps drivers can take to buy and run their car in a way that saves fuel, money and CO<sub>2</sub>.

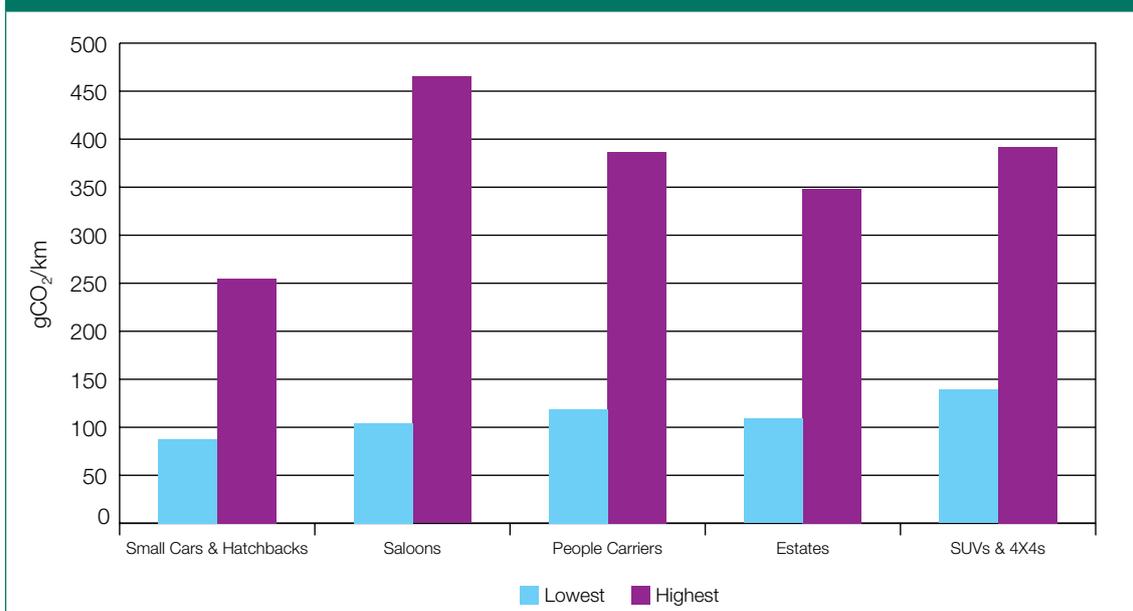


**4.48** Our aim is that the advice given through the ACT ON CO<sub>2</sub> campaign will become part of the routine decisions that car owners make. The campaign encompasses:

- Providing advice to consumers about buying the most fuel-efficient car to meet their needs;
- Focusing on the steps drivers can take to run their car in a more efficient way, such as keeping tyres inflated, changing up a gear a little earlier and driving more smoothly; and
- Encouraging people to think about reducing their car use and providing online information on the Government's wider actions to reduce transport CO<sub>2</sub> emissions.

**4.49** Studies show that substantial CO<sub>2</sub> and fuel savings could be achieved if we all purchased the most fuel-efficient car in its class.

**Figure 4.4** There are lower CO<sub>2</sub> options in all classes of car

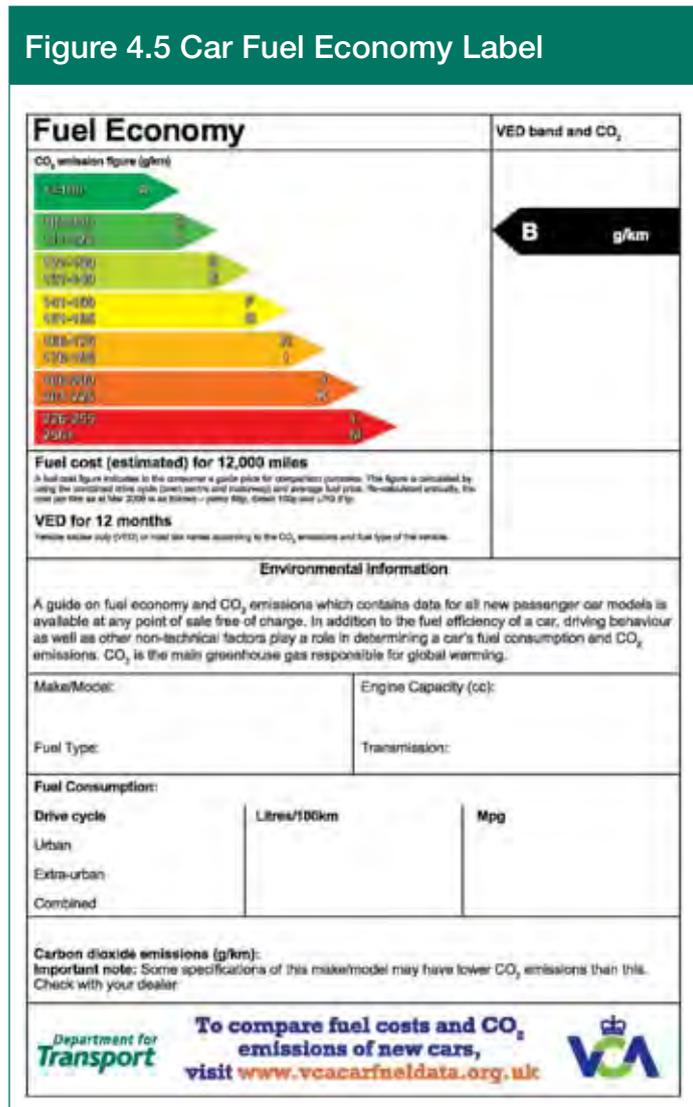


Source: DfT analysis and Vehicle Certification Agency data 2009

**4.50** To help consumers, we will continue to promote a fuel economy label for cars to raise awareness about CO<sub>2</sub> emissions and fuel efficiency. The label was originally launched in 2005 in conjunction with the Vehicle Certification Agency (VCA) and the Low Carbon Vehicle Partnership (LowCVP). By the end of 2009, we expect the LowCVP to have launched a similar label for used cars.

**4.51** We also believe it is an important to provide better consumer information for van buyers. Recent research has indicated that CO<sub>2</sub> emissions and fuel costs from new vans could be reduced by as much as 17 per cent, if everyone buying a van chose the most fuel-efficient model in its class<sup>53</sup>.

**Figure 4.5 Car Fuel Economy Label**



Source: Low Carbon Vehicle Partnership and Vehicle Certification Agency

**4.52** In June 2009 we launched an online database, in conjunction with the VCA and the Society of Motor Manufacturers and Traders, to help buyers compare the CO<sub>2</sub> emissions and fuel consumption of new vans. The database, the largest of its kind in Europe, is an important step in providing information to fleet managers and van owners on the potential CO<sub>2</sub> reductions that can be achieved by lower carbon models. The Van Fuel Data site can be accessed on the Business Link website<sup>54</sup> alongside guidance to help van buyers choose the right van for their needs.

53 DfT data

54 <http://www.businesslink.gov.uk/vanfueldata/>

- 4.53** We are working closely with fuel retailers to strengthen the ACT ON CO<sub>2</sub> campaign messages through partnership projects. This work supports the objectives of both the European Energy End-Use Efficiency Directive and the Energy Services Directive. As part of this we are currently negotiating an Energy Efficiency Agreement with fuel retailers to provide and promote fuel efficiency measures to their customers. These measures include tyre pressure gauges, eco-driving lessons, vehicle maintenance checks, advanced fuels, high performance lubricants and fuel efficiency audits.
- 4.54** We also provide funding to the Energy Saving Trust (EST) to deliver consumer transport advice directly to the public through their network of fourteen regional advice centres in England. The centres offer a freephone ACT ON CO<sub>2</sub> helpline and a variety of outreach events and engagements with local stakeholders.

#### *Promoting eco-driving techniques to new and existing drivers*

- 4.55** Eco-driving (also known as ‘eco-safe’ or ‘smarter’ driving) enables drivers to use their vehicles more efficiently and to reduce fuel consumption, costs and emissions of both CO<sub>2</sub> and local air pollutants. Estimates show that drivers could reduce emissions and fuel consumption by around 8 per cent simply by following the six smarter driving tips on the ACT ON CO<sub>2</sub> website<sup>55</sup>. Evidence from the EST indicates that this figure increases to an average of 15 per cent immediately following a smarter driving lesson.<sup>56</sup>

#### **Cutting car emissions: 6 smarter driving tips from ACT ON CO<sub>2</sub>**

- Pump up to cut down – under-inflated tyres increase emissions
- Less clutter in your car means less CO<sub>2</sub>
- Driving at an appropriate speed reduces CO<sub>2</sub>
- Less stopping and starting means less CO<sub>2</sub>
- Over-revving accelerates emissions
- Idling is wasting fuel – and adds to emissions

- 4.56** We are ensuring that new drivers know from the outset how to drive in a way that will reduce CO<sub>2</sub> emissions, and be economical and safe by integrating eco-driving into the new driving test.
- 4.57** We are also working with the EST to promote eco-driving techniques to existing drivers. The EST has undertaken a pilot programme of smarter driving lessons and will widen the programme during 2009-2010. These lessons will be organised through employers, with the cost partly subsidised

<sup>55</sup> <http://campaigns2.direct.gov.uk/actonCO2/home.html>

<sup>56</sup> Energy Savings Trust

by the Department. EST are currently rolling out driving simulators across their network of advice centres to help demonstrate smarter driving techniques.

- 4.58** Going forward, we will explore how to encourage public sector employers to make eco-driving lessons available to employees who drive for business; and how to broaden the availability of eco-driving to the wider public.

#### *Encouraging in-car technologies*

- 4.59** Drivers can find it very helpful to have dashboard technologies that provide information about the environmental aspects of their driving performance. We would like these technologies to become standard and chapter 3 has set out how we are pursuing these options through our EU and international discussions on vehicle standards.

### **Reducing CO<sub>2</sub> from business related travel and the distribution of goods**

- 4.60** For some industries and business, particularly those for whom transport represents a significant percentage of their operating costs, there are inherent incentives to increase fuel efficiency, although these may not always be exploited fully.
- 4.61** We are already taking a range of steps to reduce the CO<sub>2</sub> from business-related transport. For example, the EST conduct Green Fleet Reviews for fleets of over 50 vehicles, as well as providing advice to smaller fleets. The reviews look at fleet management and fuel data, and advise fleet managers on savings that can be made.
- 4.62** We will also continue to work with the bus, freight and logistics industries to help lower their emissions and operating costs. We are:
- Promoting eco-driving for the freight and logistics sector, for example through providing funding for the 'Safe and Fuel Efficient Driving' (SAFED) programme for van and HGV drivers. This programme teaches road skills to help industry increase safety as well as reduce fuel costs and emissions. To date, we have provided most of the cost of training for 800 instructors, 12,000 HGV drivers and 7,500 van drivers. SAFED has been shown to save up to 16 per cent of fuel on the day of training and around 5 per cent overall.<sup>57</sup>
  - Funding a £1 million demonstration programme in 2009-2010 to encourage SAFED techniques for bus drivers and to embed such practices in the bus and coach industry. This is estimated to deliver potential fuel efficiency improvements of between 8 per cent and 12 per cent.<sup>58</sup>

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<sup>57</sup> SAFED for Vans final report to DfT December 2007 <http://www.dft.gov.uk/pgr/freight/research/>

SAFED Impact Assessment <http://www.dft.gov.uk/pgr/freight/research/safedimpactassessment/safed.pdf>

<sup>58</sup> Based on the results from the SAFED Feasibility Study for Buses and Coaches carried out by Momenta in spring 2007.

- We are increasing the effectiveness of our Freight Best Practice programme, which provides advice to industry on how to reduce fuel consumption and so carbon emissions, by extending the programme to include advice to the rail and water freight industries, as well as the road freight industry. And we have recently launched a study which, for the first time, will assess what the maximum carbon savings generated by the programme might be and how best to deliver them.
- We are also launching a new Van Best Practice programme in the autumn, which will extend the benefits achieved through our Freight Best Practice programme to the rapidly growing van sector.

**4.63** Increasing the uptake of eco-driving courses has significant carbon saving potential. Our preliminary analysis shows that if 90 per cent of HGV drivers were eco-driving trained we could save up to 3 million tonnes of CO<sub>2</sub> over a five year carbon budgetary period and £300 million in fuel costs for the industry per year, a significant saving. We will therefore need to explore how to achieve this 90 per cent uptake of eco-driving courses and then consult on the potential options for doing so, including whether making eco-driving a mandatory part of the EU Driver Certificate of Professional Competence will help us do this. But as with all behaviour change measures, these savings will only be realised if the benefits of training do not erode over time. We have therefore awarded a contract to assess this, including the impact of eco-driving alongside other initiatives within an organisation which aim to support their drivers.

**4.64** We are also providing targeted capital and revenue support to enable companies to transfer from road to rail or water where the economic benefits indicate that this support is justified. In 2008-09 alone we spent £18 million to promote intermodal and bulk rail freight journeys through freight modal shift grant schemes. This programme is estimated to have removed 870,000 lorry journeys from British roads, and saved over 130,000 tonnes of CO<sub>2</sub>.<sup>59</sup>

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59 Source: DfT data

## Shifting freight from the road – success stories

### Rail – Tesco train link

The Tesco train link between Daventry and Grangemouth, which receives funding from the Department's *'Rail Environmental Benefit Procurement Scheme'*, saves 3.18 million road miles per year and reduces CO<sub>2</sub> emissions by 2,424 tonnes per year. The train carries 28 containers, each one holding 48 cages. In total 1,344 cages are carried on the train which completes 10 trips each week. The cages carried by the train were previously moved by 18 double-deck trailers. This amounted to a saving of 180 double-deck movements per week.



Source: Freight Best Practice case study 1094

- 4.65** We are in the process of revising our rail revenue support scheme to include inland waterway bulk transport from 1 April 2010, and will be issuing new guidance to ensure the scheme is easier for the industry to understand and use. Shifting freight movements from road to rail or water also brings benefits across our other transport goals – reducing both congestion and improving local air quality.

### *Further opportunities on CO<sub>2</sub> from business-related transport*

- 4.66** The facts are compelling on business-related travel and freight transport – together they account for over 50 per cent of greenhouse gas emissions from transport in the UK. Working with business to deliver sustained reductions in these areas must therefore be an important part of this strategy.
- 4.67** Many businesses have demonstrated that cutting their carbon emissions in these areas can deliver significant benefits – from the cost savings that arise from more efficient operations, to the contribution these can make to an organisation's corporate social responsibility agenda. The policies set out above can all contribute to these objectives.
- 4.68** However, not all organisations do everything they can to achieve these outcomes. Reducing business-related travel by employees may be viable for some organisations, but could put others at a competitive disadvantage. Transport or distribution costs are marginal for some organisations, and even when they do have a greater impact, action can be inhibited due to a lack of information, or to the risks associated with changes to business practices and contractual relationships.

### United Biscuits and Nestle

By sharing loads on their lorries, United Biscuits and Nestle have removed over 175,000 lorry miles per year from the road network.

This collaboration has cut around 245 tonnes of CO<sub>2</sub> and delivered significant cost savings, but required hard work and innovation to overcome a range of obstacles. These included:

- protecting competitive advantage for each business;
- vehicle branding issues; and
- sharing cost savings fairly, without revealing sensitive information to a competitor.

The outcome was delivered thanks to the drive of the individuals concerned, backing from the very top of both organisations and support and advice from the Institute of Grocery Distribution.

- 4.69** For these reasons, our aim is to make lower carbon decisions on transport easier and more self-sustaining for business. We want to explore how best to generate greater levels of senior management attention on strategies for reducing transport emissions.
- 4.70** For freight and logistics, discussions with operators and companies at our annual *Listening to Industry* events have shown that before we can consider how far businesses can deliver on carbon saving opportunities, there is a need for a standardised and clear approach to measuring emissions across complex freight and logistics supply chains.
- 4.71** Today we have therefore launched a new working group with the aim of developing a consistent carbon measurement and reporting method and standard for the logistics transport supply chain. The group will look to build on existing methods and guidance and will look across all modes of freight transport. This will be a standard for industry, developed by industry, and we anticipate that it will form the basis of any future reward structure – such as a voluntary recognition scheme – which industry, or potentially Government, could develop<sup>60</sup>.

<sup>60</sup> The initial membership of the working group includes those organisations who represent the freight and logistics customer: the Freight Transport Association, the Chartered Institute of Logistics and the Food Storage and Distribution Federation. The group will also include advisory members, such as the Carbon Trust. As work develops, we will extend the membership to involve those organisations with sectoral interests.

- 4.72** For business travel and commuting, we will examine these issues further through the National Business Travel Network. This group was established to encourage the development of work-based travel plans and other measures to reduce business travel. In the coming year, a key task for the Network will be to explore the option of a voluntary carbon reduction target for members and require that members submit information about their business and travel plans, plus targets – and to investigate the options for rewarding and recognising success.

### **Leading by example**

We intend to lead by example in reducing the emissions from public sector business travel and commuting.

Evidence from the Department's National Travel Survey shows that 28 per cent of business and commuting journeys by household cars are carried out by public sector workers. We are looking at how best to tackle these journeys. We recognise the challenge of measuring and monitoring carbon emissions from commuter journeys generated by the government estate.

We will therefore seek to develop methodology and guidance for the measurement of carbon emissions from the commute with the intention of running a pilot in central government. In addition, we are considering the potential to integrate business travel into departmental carbon budgets for the government estate in the second carbon budget period (2013 to 2017).

We are also looking at how to integrate the carbon footprint of transport logistics into the assessment of emissions from across Government's estate and operations.

- 4.73** These are important next steps and we will need to work closely with industry to determine whether these initial actions are successful. If the measures that make business sense do not deliver sufficient carbon savings, or if few businesses have the resources or ability to overcome the barriers to taking action, we will need to consider what further measures could be needed to make reductions in CO<sub>2</sub> a regular part of business decision making.

## The need to travel

**4.74** Beyond the measures set out above that seek to promote lower carbon transport choices, we should not lose sight of a more fundamental long-term solution – identifying ways of reducing the amount we need to travel. We see two main areas of possibility: the use of technology and spatial planning.

### ***Using technology to reduce the need to travel***

**4.75** New technology, such as telepresencing, can transform the way we work. Many employers now also provide opportunities to work from home or to shift commuting patterns to suit our lifestyles. Research suggests that the carbon footprint of home-working is not always smaller than that of more traditional work practices, so these ideas need to be assessed dispassionately.

**4.76** Furthermore, many central and local government services can now be accessed online, avoiding the need to travel to our destination.

**4.77** The internet has also transformed the way that we shop. Although increasing numbers of home deliveries have implications for the amount of vans travelling on our roads, these deliveries can be many times more efficient than car journeys. This offers potential to cut the number of trips that we make.

### ***Spatial planning and the need to travel***

**4.78** The pattern of transport demand is heavily affected by the way we use land. For example, spreading workplaces, retail developments and homes over a wide area requires people to travel further and makes it much more difficult and expensive to plan efficient public transport services.

**4.79** National planning policies already require local authorities to take account of the potential consequences for transport when making planning decisions. We need to ensure that these approaches are being consistently applied by local authorities to facilitate more sustainable travel patterns and choices.

**4.80** Along with the Communities and Local Government department we will also continue to take steps to ensure that the need to reduce carbon emissions is reflected in planning guidance. For example, in the 2007 document *Planning and Climate Change: Supplement to Planning Policy Statement 1*, supporting sustainable travel options and reducing the need to travel by car are key planning objectives.<sup>61</sup>

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<sup>61</sup> <http://www.communities.gov.uk/publications/planningandbuilding/ppscclimatechange>

- 4.81** This approach will also be reflected in other Planning Policy Statements including Guidance on Regional Strategies and the National Policy Statements for ports, national networks and airports. These are part of the process of implementing the planning reforms set out in the Planning Act 2008 and must be produced with regard to the desirability of mitigating and adapting to climate change.

# Chapter 5

## Using market mechanisms to encourage a shift to lower carbon transport



# Using market mechanisms to encourage a shift to lower carbon transport

- 5.1** It is only fair that the prices of our goods and services should reflect the full costs that they impose on society. Future generations should not have to pay the climate change costs of decisions that we make today.
- 5.2** Factoring carbon costs into the prices we pay for transport provides incentives for us to be either more energy-efficient or to opt for lower carbon alternatives. It also sends the right long-term signals for investment.
- 5.3** For international aviation and shipping one form of pricing – emissions trading – is a particularly relevant market mechanism. These are growth sectors that operate across international borders and, as such, trading mechanisms offer an attractive option for binding these sectors into the global effort to reduce emissions.

By 2050, carbon pricing will operate at all levels in a radically decarbonised transport system – providing incentives for the development and quicker adoption of new technologies; as well as influencing the choices that we all make in using our transport networks.

There are three main routes to using pricing in climate change policy – either indirectly through regulation, or directly through taxation or through trading. The preceding chapters in this strategy have outlined the regulatory approaches we are adopting across transport modes. Our strategy also aims to ensure the other two elements of pricing – taxation and trading – are used to encourage the shift to low carbon transport.

- We will be at the forefront of efforts in the EU and beyond to deliver effective emissions trading mechanisms that apply to international aviation and shipping.
- Fiscal measures, such as fuel duty, company car tax, vehicle excise duty and air passenger duty provide price signals to businesses and consumers.

## The challenge

- 5.4** Carbon pricing is a complex matter. The price itself can be subject to a range of uncertainties and changes in costs can produce very different responses from people, business or the economy as a whole.

- 5.5** And as pricing carries implications across many aspects of society – from fairness and equality to both individual and public finances – the use of pricing measures can be controversial. Research shows that people recognise the use of price signals as a way to influence choices and cover environmental (and other) costs<sup>62</sup>, but are understandably unwilling to pay higher prices for transport.
- 5.6** Commentators often point to the falling cost of motoring in comparison with the average rise in costs of public transport as a challenge to be addressed if we are to achieve our carbon objectives.
- 5.7** As has been made clear in the rest of this document, tackling CO<sub>2</sub> emissions from road transport is fundamental to the Government's approach. As well as through technology, and promoting lower carbon choices, the structure and level of individual taxes send signals and help inform the choices that people make.
- 5.8** Finally, although not part of our carbon budgets, tackling international aviation and shipping emissions is vitally important. Robust and co-ordinated international action is needed to ensure that these sectors reflect the costs of their emissions.

## Using economic instruments

- 5.9** It is essential that we make use of all of the levers at our disposal. The preceding chapters outline the regulatory approaches that we are adopting across all modes. This section focuses on the other two elements of pricing – tax and trading.
- 5.10** Government is taking action to:
- Promote the use of trading systems to reduce emissions in aviation and shipping; and
  - Send price signals through appropriate fiscal measures.

### **Promote the use of trading systems to reduce emissions in aviation and shipping**

- 5.11** Emissions trading systems aim to use market forces to deliver emissions reductions in the most cost-effective manner possible. They guarantee a specific environmental outcome – usually in the form of a binding 'cap' on emissions – that tightens over time. This can then be met through a mixture of emissions reductions in a given sector, or by allowing participants to pay for emissions reductions to be delivered by others, if they can be delivered more cost-effectively elsewhere.

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62 See for example the Stern Review – [http://www.hm-treasury.gov.uk/stern\\_review\\_report.htm](http://www.hm-treasury.gov.uk/stern_review_report.htm)

- 5.12** We believe that these mechanisms are particularly relevant to international emissions, such as those from aviation and shipping. These sectors operate across international borders and serve global markets – and consequently we consider that action is best taken at international level to address them. This is why we are pressing for agreement on global sectoral targets for international aviation and shipping in the global deal being negotiated at Copenhagen, and we are promoting international emissions trading mechanisms as a key policy lever.



- 5.13** Emissions trading has some significant advantages over other measures. Inclusion of aviation in the EU Emissions Trading System from 2012 will set an overall cap for the sector and allow airlines to determine how and where the emissions reductions will be achieved. It will also ensure that, by allowing companies to trade allowances, reductions are achieved in the most cost-effective way possible.

### **Including aviation in the European Emissions Trading System**

The EU Emissions Trading System (ETS) is a legally binding mechanism that caps CO<sub>2</sub> emissions across the EU. It applies to the most carbon-intensive industries and works by allocating CO<sub>2</sub> allowances up to a defined cap.

The aviation industry will be included in the EU ETS from 2012 and will therefore have to make its fair share of emissions reductions under the ETS cap.

It means that net aviation emissions cannot increase from 97 per cent of average 2004-06 levels in 2012 and 95 per cent of 2004-06 levels from 2013. Any growth in aircraft CO<sub>2</sub> emissions above these levels will only be possible through commensurate savings in other ETS sectors.

The System will be regulated in the UK by the Environment Agency with support from the Civil Aviation Authority. The Government is preparing implementing legislation which includes a series of civil penalties for non-compliance.

- 5.14** We are also keen to promote the use of market mechanisms and trading in tackling emissions from international shipping. A number of key decisions in the coming months and years are critical for determining the rate of progress in this area.
- 5.15** Our aim is for there to be an international agreement on the reduction of maritime emissions, either through the International Maritime Organization (IMO) or the United Nations Framework Convention on Climate Change (UNFCCC), thus binding the shipping sector into a global approach for tackling climate change. An agreement through the IMO would require agreement from Member States; and an agreement from the UNFCCC would require agreement from the European Community. Both approaches will require considerable effort in building international consensus and collaboration.



- 5.16** In light of these challenges, we have supported the contingent approach agreed under the EU 2020 package. This has established that if there is no international agreement through the IMO or UNFCCC by 31 December 2011, then the European Commission has the authority to make a proposal to include international maritime emissions in the EU ETS with an entry into force date of 2013.

### **Sending price signals through fiscal measures**

- 5.17** Fiscal measures primarily play an important role in ensuring the stability of the public finances but can also have a significant impact on CO<sub>2</sub> emissions from transport. They can lead to cuts in CO<sub>2</sub> by, for example, incentivising fuel-efficient vehicle purchases, encouraging more fuel-efficient behaviour and potentially encouraging lower carbon transport choices more generally.
- 5.18** As set out in the *1997 Statement of Intent on Environmental Taxation*, the Government aims to ensure that the burden of taxation falls in such a way as to support the overall transition to a low carbon economy where

possible<sup>63</sup>. For this reason, we have taken a number of steps to reform the structure of transport taxes since 1997; and chapter 7 of Budget 2009<sup>64</sup> sets out the role that transport taxes will continue to play in both supporting fiscal consolidation and further emissions reductions.

- 5.19** In relation to road transport emissions, Budget 2009 announced that fuel duty will increase by 2 pence per litre on 1 September 2009 and by 1 pence per litre in real terms on 1 April each year from 2010 to 2013. Whilst aimed primarily as a measure to support fiscal consolidation, this is also estimated to save 2 million tonnes of CO<sub>2</sub> per year by 2013-14.
- 5.20** We need to move over time to a cleaner fleet that burns less fossil fuel and emits fewer pollutants. The Government is committed to encouraging the purchase and manufacture of lower-emitting vehicles through both vehicle excise duty (VED) and company car tax such that individuals and businesses can save money by buying their preferred type of car but choosing a version with lower emissions. In 2001, the UK was the first country in the EU to reform VED to ensure that the level of tax paid reflects the emissions of the vehicle. Company car tax was also restructured to reflect CO<sub>2</sub> emissions in 2002. Since then, the Government has further developed these structures and will continue to use these tools in order to support manufacturers in meeting the EU targets for new car CO<sub>2</sub> emissions.
- 5.21** We recently announced a number of changes to strengthen this system, to signal that when people buy a new vehicle, they can save money by choosing a 'best in class', lower CO<sub>2</sub> emitting vehicle. To this end, Budget 2009 confirmed that:
- In May 2009, the number of VED bands increased from seven to thirteen, providing a greater incentive for drivers to choose best in class vehicles. The rates charged under each of these bands will continue to be separated out in April 2010;
  - From April 2010, differential first-year rates of VED for new vehicles will be introduced, to provide a stronger signal to consumers at the point of purchase. In 2010, cars emitting less than 130gCO<sub>2</sub>/km will pay no VED in the first year, whereas cars emitting over 255gCO<sub>2</sub>/km will pay £950; and
  - In addition, Budget 2009 announced that company car tax thresholds will shift down by 5gCO<sub>2</sub>/km in both 2010 and 2011 in order to reflect the increasing efficiency of new car purchases. Electric vehicles already pay no fuel duty or VED, and are subject to the lowest percentage of company car tax.

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63 *Tax and the Environment: Using Economic Instruments* (published alongside the PBR in 2002), also sets out the framework for using the tax system – as part of a wider range of instruments to contribute to an effective environmental policy.

64 [http://www.hm-treasury.gov.uk/bud\\_bud09\\_index.htm](http://www.hm-treasury.gov.uk/bud_bud09_index.htm)

- 5.22** The Government is also reforming air passenger duty, expanding the number of distance bands, to continue to send environmental signals to passengers and the industry alike, and ensure the sector contributes fairly to public services.

## Price, public transport and planning for the longer term

- 5.23** The fiscal measures detailed above provide a framework to incentivise more carbon-efficient transport choices now and in the medium-term. The Government is also taking action on prices and public transport.
- 5.24** The mandatory England-wide bus concession, which we introduced in April 2008, has given people over 60 and eligible disabled people free bus travel. Some 11 million people are eligible, and central government provides funding of around £1 billion a year. Total public investment in bus services is around £2.5 billion a year – a doubling of public spending on buses compared to the position in 1997.
- 5.25** The Local Transport Act 2008 gives powers to local authorities under statutory Quality Partnership Schemes, to agree maximum fares with operators. The majority of bus services are provided on a commercial basis by private operators. Fares beyond the concessionary categories are generally a matter for their commercial judgement. Operators are of course sensitive to market conditions, and both the Government and local authorities expect them to be pricing people onto buses not off them.
- 5.26** Where this is not the case, the new powers in the Local Transport Act give councils much greater powers to intervene to ensure that local bus services better serve the public.
- 5.27** The Government regulates the fares for about 60 per cent of all rail journeys. The net effect of the regulatory regime over the past 12 years has been only a small rise – about 5 per cent – in the real cost of regulated rail fares, in a period when average disposable income has increased by more than 20 per cent.
- 5.28** The current formula for setting regulated fares is tied to the Retail Price Index (RPI). In most cases, operators are allowed to increase regulated fares each year by 1 per cent more than the annual increase in the RPI the previous July. RPI is currently negative. The Government has made it clear that if RPI continues to be significantly negative, it will enforce a reduction in regulated fares in January 2010.
- 5.29** Over the longer term, there are other possible measures available that could potentially play a role in reducing carbon emissions from road transport.

- 5.30** The growing problems of congestion are of major long-term significance to the UK. Beyond the frustration for motorists, it is bad for the environment and bad for the economy. The Eddington Report predicted that if left unchecked, congestion could cost the economy around an extra £22 billion every year by 2025.<sup>65</sup> It was in this context that Eddington and others have recommended developing the concept of a national system of road pricing.
- 5.31** The Government has no plans to introduce a national system of road pricing. It remains the case, however, that local authorities can develop local congestion charging schemes. Given this wider context it would be irresponsible not to look at the important issues that charging according to road usage raises. We are therefore exploring through trials how a scheme charging by time, distance and place could be designed so that it could safeguard people's privacy whilst operating reliably, accurately and cost-effectively.
- 5.32** However, our focus now is on the things that we can do in the shorter-term – to relieve pressure on the most overcrowded routes, to give road users greater choice over the journeys they take, and to recognise the premium they put on the reliability and predictability of journey times.

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<sup>65</sup> Source: <http://www.dft.gov.uk/about/strategy/transportstrategy/eddingtonstudy/>

# Chapter 6

## The impact of this strategy



# The impact of this strategy

The measures set out in this strategy will ensure that transport makes a major contribution towards delivery of the Government's carbon budgets.

Before the impact of the measures in this strategy are taken into account, our existing policies mean that emissions from transport are projected to be around 15 million tonnes of CO<sub>2</sub> lower than they would otherwise have been in 2020.

On top of this, the further measures set out in this strategy mean that we project to **save an additional 85 million tonnes of CO<sub>2</sub>** over the third carbon budget period from 2018-2022.

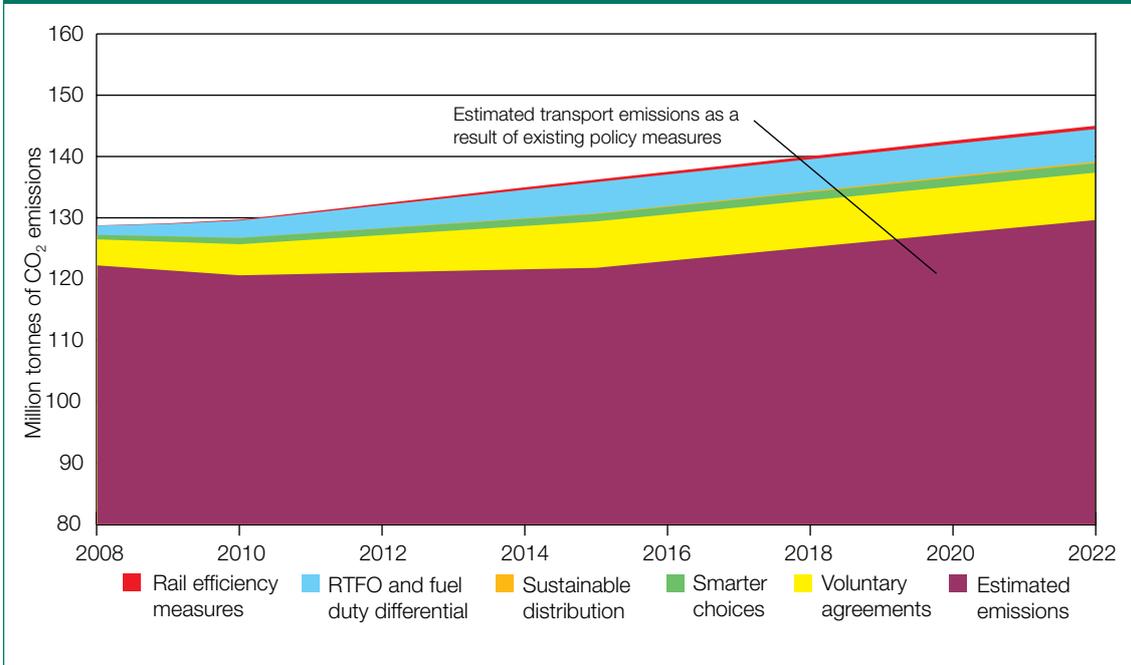
We will not stop here. There are ideas set out in the strategy that will offer further cuts in emissions, but we are yet to quantify their likely impact. We will continue to develop these options and seek ways to assess their potential more accurately as we develop our strategy in the months and years ahead.

We will be developing an implementation plan setting out appropriate milestones and monitoring mechanisms and will publish this in spring 2010.

## Where are we now

- 6.1** In chapter 2, we set out more details on the current state of transport emissions in the UK. Figure 6.1 below shows our forecast for transport emissions including the positive impact of some of our existing policies. Before the measures in this strategy are taken into account, we estimate that emissions will be around 15 million tonnes of CO<sub>2</sub> lower than they would otherwise have been in 2020.

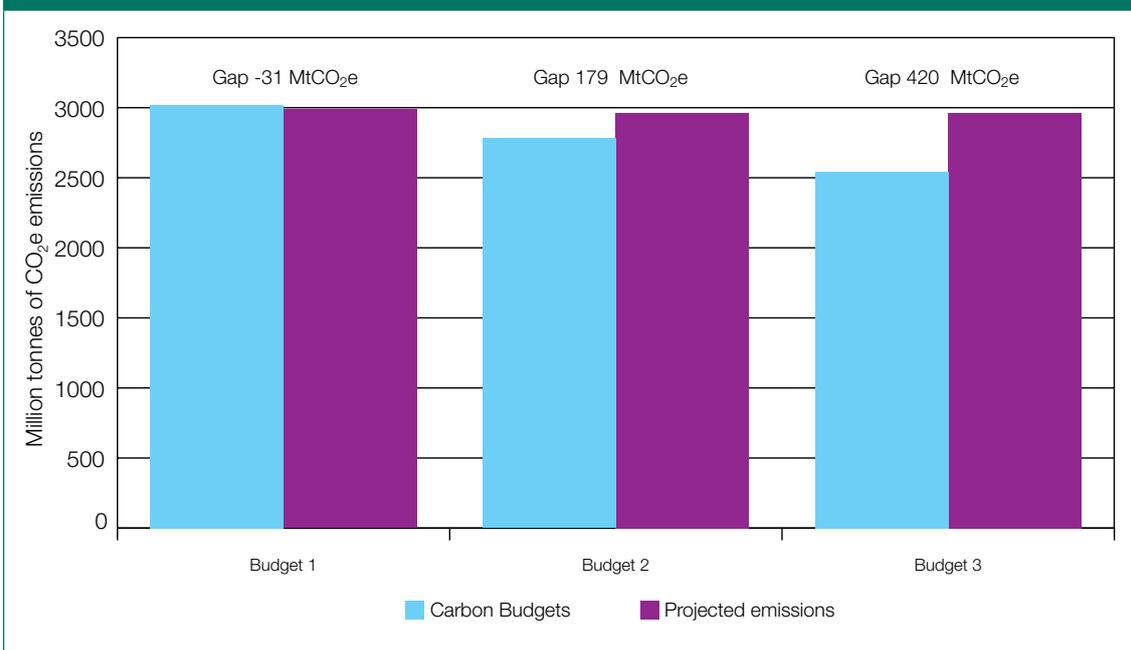
**Figure 6.1: Without the measures set out in this strategy domestic transport emissions are forecast to grow**



Source: DfT analysis 2009

**6.2** Looking across the economy, without the measures in this strategy and those contained within the Government’s *UK Low Carbon Transition Plan*, emissions would not fall by enough to meet the UK’s ambitious carbon budgets.

**Figure 6.2: The potential gap between projected emissions and the carbon budgets**



Source: Department of Energy and Climate Change 2009

## Where this strategy will take us

### Modelling approach

- 6.3** Most of the measures in the strategy have been analysed using Marginal Abatement Cost (MAC) curve modelling (see box below). For other measures at an earlier stage of development, we have used the best available estimates of the impacts of any given policy.
- 6.4** The strategy also sets out further policy options where it has not been possible to estimate the potential emissions savings – for example, the impact of the Sustainable Travel Cities or the ACT ON CO<sub>2</sub> campaign. The impact of these measures would therefore be additional to the projected emissions savings set out below.
- 6.5** In presenting the results of our modelling for individual policy measures we have identified both their ‘direct’ and ‘indirect’ impacts. Direct impacts arise as a direct result of the policy; for example, tighter efficiency standards for new cars result in fuel savings and therefore lower CO<sub>2</sub> emissions. Indirect impacts are those arising from an expected knock-on effect of a given policy measure. For example, the same fuel savings will mean that drivers are likely to drive more as car running costs fall – meaning that overall, we save less fuel and CO<sub>2</sub> than what we might expect. This is known as the ‘rebound effect’ and we have taken this into account in our assessments.
- 6.6** Further detail on our modelling approach, as well as on each of the measures and their impacts, is given in the supporting Impact Assessment to this strategy<sup>66</sup>.
- 6.7** The Impact Assessment also sets out how our approach to estimating emissions savings compares to the MAC curve modelling undertaken by the Committee on Climate Change (CCC) to inform their advice to Government, published in December 2008<sup>67</sup>.

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<sup>66</sup> Available at <http://www.dft.gov.uk/carbonreduction>

<sup>67</sup> Available at [www.theccc.org.uk/reports](http://www.theccc.org.uk/reports)

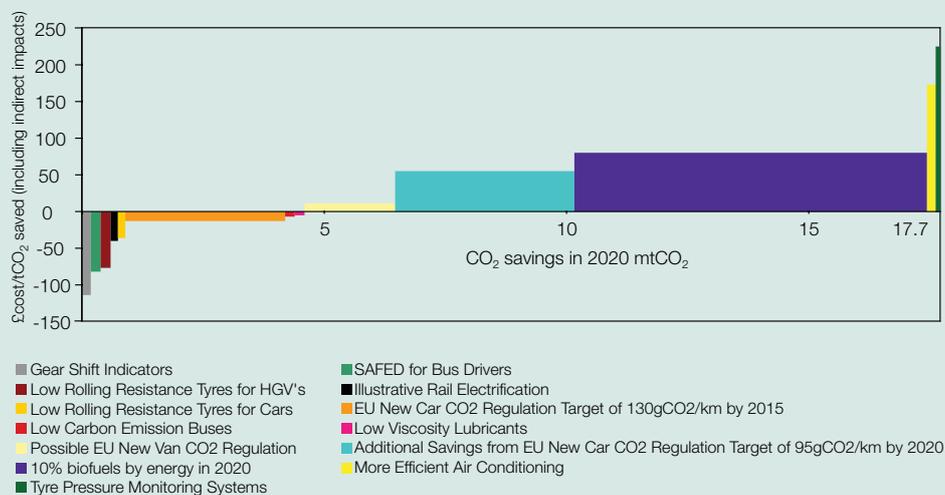
### A marginal abatement cost curve for the transport sector

The Marginal Abatement Cost (MAC) curve modelling approach is a useful tool that illustrates the relative CO<sub>2</sub> savings and cost-effectiveness of the options available to us in reducing emissions. It assesses the potential that each policy has to reduce emissions and the cost per tonne of CO<sub>2</sub> saved.

There are a number of valid methodologies for constructing MAC curves. The approach we have chosen for transport is focused on policies (i.e. what we expect to be feasibly delivered as a result of our interventions), rather than technical potential (i.e. what technology could theoretically deliver) as it provides a pragmatic assessment of the costs and impacts of our strategy.

Our approach has also recognised the linkages between policies and considers the cumulative impact of individual measures, to avoid any double counting of savings. More detail on the methodology is provided in the associated Impact Assessment.

The MAC curve below shows the further measures set out in this strategy, beyond our existing policies (excluding, for example, impacts of the current Renewable Transport Fuel Obligation and sustainable freight activities). They are shown in order of cost-effectiveness with the width of the bars indicating our central estimate of the potential of CO<sub>2</sub> that could be saved in 2020.



Source: DfT analysis 2009

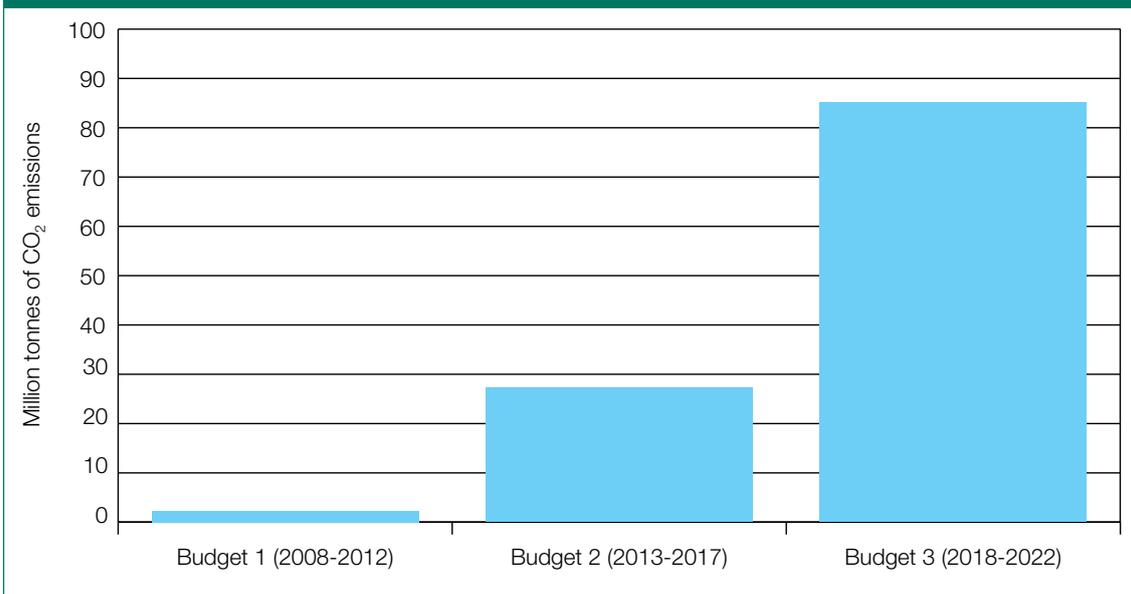
The measures that fall below the line pay for themselves – saving more than they cost to implement. These include the use of gear shift indicators or low rolling resistance tyres.

As with all modelling, the MAC curve uses a set of assumptions, such as the costs of future technology, GDP and population growth, and the results are inherently uncertain. Estimates of emissions savings and the cost-effectiveness of measures for which the final shape of the policy is still to be agreed (such as new van efficiency standards to be agreed at EU level) or where there is only very limited data available (such as Safe and Fuel Efficient Driving training for bus drivers) are particularly uncertain.

## Results of the analysis

6.8 Figure 6.3 shows the projected emissions savings from the measures in this strategy over each of the first three carbon budget periods, under central assumptions. This is in addition to the substantial CO<sub>2</sub> savings that are expected as a result of existing policies that are included in our baseline.

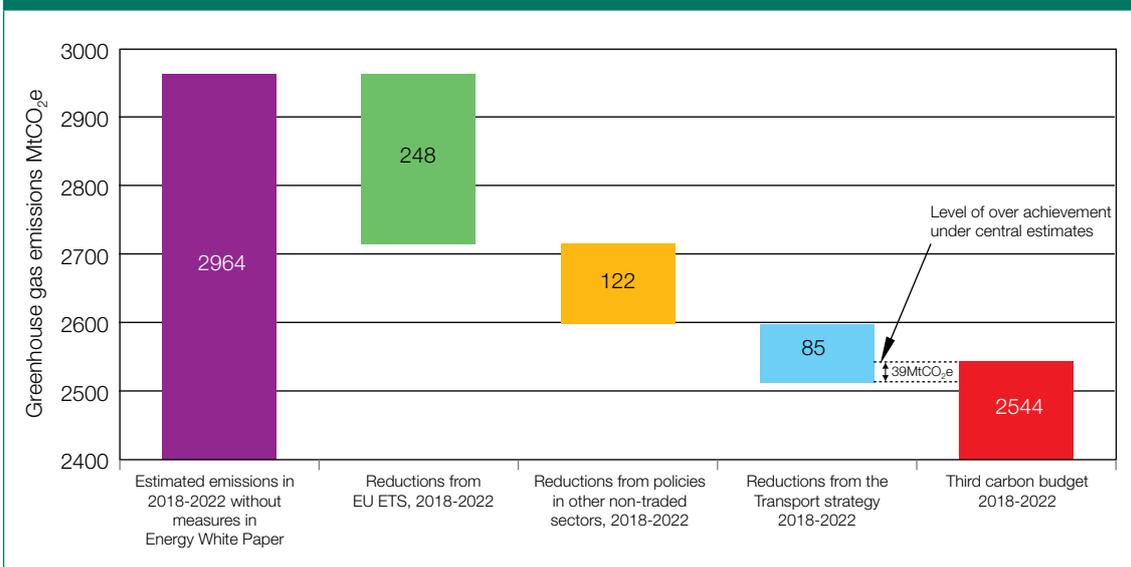
**Figure 6.3: Transport is making a significant contribution to the UK's carbon budgets**



Source: DfT analysis 2009

6.9 Figure 6.4 puts transport's contribution into the wider context of the emissions savings being delivered across all sectors of the UK economy in the third carbon budget period.

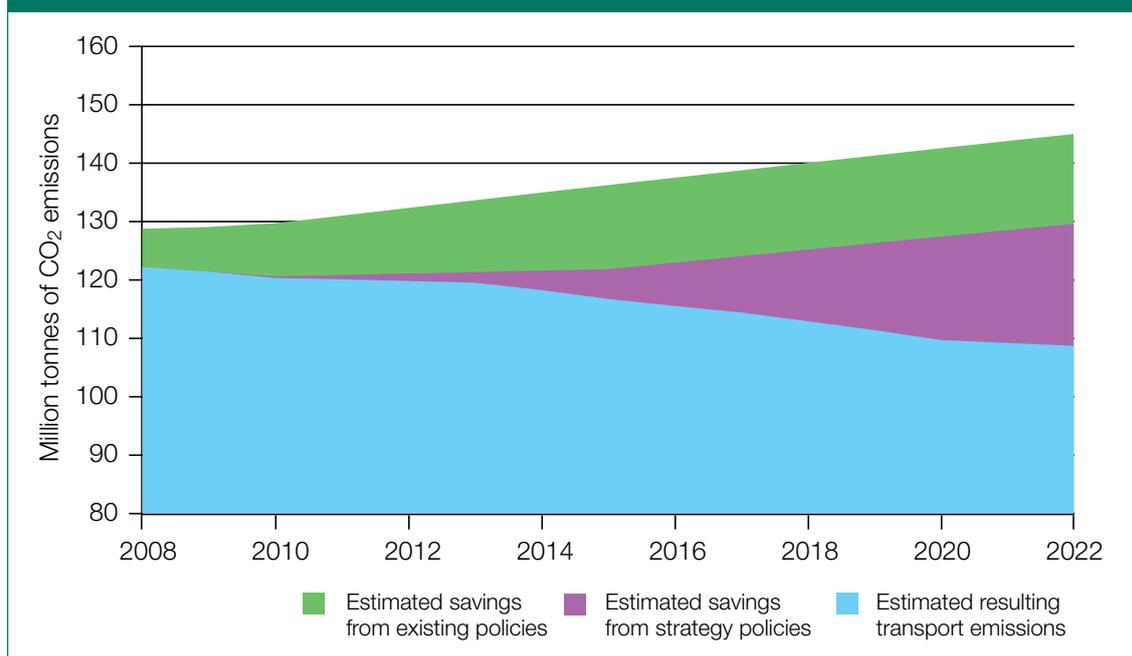
**Figure 6.4: Achieving the third carbon budget**



Source: Department of Energy and Climate Change; DfT analysis 2009

- 6.10** The measures in this strategy that we have been able to quantify at this time are expected to save about 85 million tonnes of CO<sub>2</sub> over the third budget period. Measures in the rest of the non-traded sector are also expected to contribute about 122 million tonnes of CO<sub>2</sub>e<sup>68</sup>.
- 6.11** Overall, if our measures deliver as expected under our central estimates, we would be on track to achieve each of our carbon budgets. However, the uncertainty in projecting future emissions is such that there is a significant chance that domestic emissions could be higher than central projections. We therefore need to ensure that our existing measures deliver as expected; that we have a degree of contingency to deal with unexpected events; and that we continue to look for further opportunities to reduce emissions wherever this can be achieved at least cost.
- 6.12** For the transport sector, the measures in this strategy are projected to reduce emissions to about 110 million tonnes of CO<sub>2</sub> by 2020 – a reduction of 17.7 million tonnes of CO<sub>2</sub> in 2020.<sup>69</sup>

**Figure 6.5: Our actions mean domestic transport emissions are forecast to be around 14 per cent lower by 2020 compared to 2008**



Source: DfT analysis 2009

- 6.13** Any savings from measures that have yet to be quantified will be additional to these. We will continue our analysis to estimate the CO<sub>2</sub> savings of

<sup>68</sup> CO<sub>2</sub>e is a measure of all greenhouse gases, converted into an equivalent amount of CO<sub>2</sub>, based on global warming potential. This enables the total amount of UK greenhouse gas emissions to be summed and presented as a single number. The savings from the rest of the non-traded sector include emissions of other greenhouse gases, such as methane from agriculture.

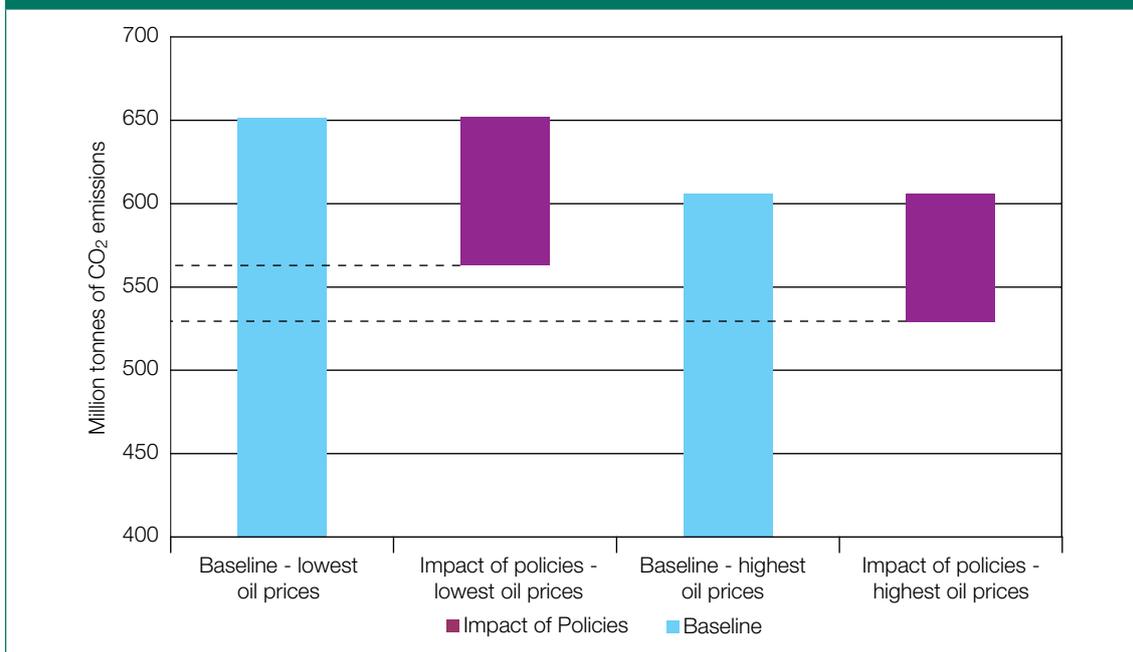
<sup>69</sup> Results presented here may differ marginally to those in *The UK Low Carbon Transition Plan* because they are generated by 2 different models, the DECC Energy Model and the National Transport Model. For more detail of the differences between the 2 models see: <http://www.dft.gov.uk/pgr/economics/ntm/roadtransportforcasts08/rtf08.pdf>

policies as they develop and will include these in the Impact Assessments for each policy option.

**6.14** Estimates and forecasts are, by their nature, inherently uncertain. Assumptions have to be made about how key variables will change over time, such as fossil fuel prices. We have therefore undertaken some sensitivity testing, which considers the impact of the change in some of these key variables on the estimates of emissions savings from our measures.

**6.15** Figure 6.6 below shows the impact of using DECC's alternative fossil fuel price projections on the baseline and on the level of potential emissions savings from transport measures, over the third budget period. It suggests that, under high oil price assumptions, the baseline level of transport emissions is relatively low, as motorists respond to the higher price of fuel by driving less. However, the total emissions saving from policy is also estimated to be lower, as fuel use is lower. The overall impact is for transport emissions to be lower under higher oil price scenarios.

**Figure 6.6: Impact over the third carbon budget period of varying the oil price forecast assumption**



Source: DfT analysis 2009

## Impacts on our other goals

**6.16** The Department has five strategic goals for transport which are to:

- reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of tackling climate change;

- support national economic competitiveness and growth;
- contribute to better safety, security and health;
- promote greater equality of opportunity; and
- improve quality of life and promote a healthy natural environment.

- 6.17** The core aim of this strategy is to deliver against our goals to reduce CO<sub>2</sub> and greenhouse gas emissions from transport. However, it also has strong links with our other strategic goals. This section sets out how the key strands of the strategy (supporting a shift to new technologies and cleaner fuels, promoting lower carbon choices and using market mechanisms to encourage a shift to lower carbon transport) fit with our four other strategic goals. Further details can be found in the Impact Assessment.
- 6.18** Supporting a shift to new technologies and cleaner fuels aligns well with our goal of supporting economic competitiveness and growth. Both will re-shape transport energy use in the UK, reducing our dependence on oil in the long-term and increasing our resilience to oil price shocks.
- 6.19** However, the transition to lower carbon technology will involve bringing forward investment that otherwise would only occur when oil prices are high and expected to remain high. This means that some measures impose net costs on business and consumers. The mix of policy instruments used in this strategy, and the way those policy instruments are designed, is specifically aimed at supporting national economic competitiveness and growth by minimising regulatory burdens. Using prices to encourage a shift to lower carbon transport allows transport providers and users to respond flexibly to the incentives they face. This ensures that CO<sub>2</sub> savings are made at least cost to the economy.
- 6.20** There are also links to our goal to promote safety, security and health in that new transport technology and lower carbon fuels will potentially have impacts on air quality. There are potential risks and benefits – for example, a shift to diesels could have adverse air quality impacts, whereas a shift to electric or hybrid vehicles could have air quality benefits. We have sought to minimise the risks to air quality through careful design of policy instruments and will monitor the impacts closely.
- 6.21** Promoting lower carbon travel choices has strong links with all four goals. It is a key part of our efforts to tackle congestion in urban areas and on inter-urban roads. Tackling congestion supports national economic competitiveness and growth by reducing journey times, and improving reliability.
- 6.22** Health benefits are expected due to the increased uptake of active travel modes, such as walking and cycling. Promoting lower carbon travel choices

is also expected to deliver air quality improvements, by reducing traffic volumes and through the effects of eco-driving.

- 6.23** Equality of opportunity benefits are expected to result from the provision of accessible public transport, and broadening the range of transport choices available are important tools for delivering a fairer society.
- 6.24** Quality of life benefits are expected from the development of sustainable travel solutions, particularly in urban areas – by reducing traffic volumes and noise.
- 6.25** More widely, this strategy supports the Department’s commitment to act consistently with the principles set out in the UK’s sustainable development strategy *Securing the Future*, published in 2005<sup>70</sup>.

## Evaluation

- 6.26** The strategy will be evaluated as part of the post-implementation review of the Climate Change Act 2008. This review will follow the process set out in the Act for the UK as a whole. It will focus on the UK’s performance towards meeting its legislated carbon budgets and targets, and will be ongoing, as detailed in the reporting requirements of the Act. Specifically, this means that the following reviews will be required:
- an annual report by the CCC, laid before Parliament, assessing the UK’s performance and progress towards achieving its legislated targets and budgets. The first report is due by 30 September 2009;
  - a Government response to the CCC’s annual report, laid before Parliament by 15 January 2010;
  - a repetition of this process by 30 June and 15 October in subsequent years; and
  - in the CCC’s annual report for 2014 (when all of the relevant data for the first budget period become available) a statement of its views on the manner in which the Government has carried out its functions in relation to meeting its legislated budget for the period 2008-12; this statement will then be repeated after each budget period, when all data for that budget become available – in 2019, 2024, 2029 and so on.
- 6.27** Alongside these reviews, we will also continue to strengthen the evaluation evidence on the impacts of many of the key policy measures and levers contained in the strategy.

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<sup>70</sup> <http://www.defra.gov.uk/sustainable/government/publications/uk-strategy>

# Chapter 7

## How this strategy will work



## How this strategy will work

- 7.1** The success of this strategy will rely on the concerted efforts of many – there are important actions to be taken by government and business, and important choices to be made by individuals. This section summarises the roles that each of these can play in reducing CO<sub>2</sub> emissions from transport.
- 7.2** As many transport issues are the responsibility of the Devolved Administrations, this section also sets out a summary of relevant activity being pursued in Scotland, Wales and Northern Ireland.

### National government

#### *Within transport*

- 7.3** National government has an essential role in delivering many of the policies set out in the chapters above. We will need to set the performance frameworks and incentives for lower carbon transport technology and fuels; invest in low carbon research, development and demonstration; and encourage lower carbon transport choices through promoting public transport, sustainable modes, greater integration and providing better information. We will lead by example in how we manage emissions from our own operations and estate.
- 7.4** There is a further vital role for national government in working with EU and international partners to provide the right incentives to influence business and industry behaviour at an international level. This is the case for all vehicle types and modes; but in particular we will push hard for the inclusion of aviation and shipping emissions in a global deal on climate change at Copenhagen. In aviation specifically we will pursue strongly an ambitious approach aimed at containing and managing emissions effectively.



- 7.5** We are also committed to changing the way long-term decisions around transport planning are made. We have identified five goals (including one that focuses explicitly on reducing emissions of CO<sub>2</sub> and other greenhouse gas emissions) that will guide future transport policy-making and infrastructure investment decisions. We are already taking these into account in the guidance we give to our delivery partners.
- 7.6** We have revised our policy appraisal tools so that they better capture environmental impacts, and in particular will incorporate the new values for carbon emissions in line with the conclusions of the DECC review of the Shadow Price of Carbon.

### **Wider government**

- 7.7** Some policies led by other government departments have direct synergies with the CO<sub>2</sub> reduction agenda in transport. We will continue to work in partnership on these. For example:

- With the Department of Health and the Department for Children, Schools and Families, we are encouraging children to walk or cycle to school which not only brings transport benefits such as reduction of congestion and emissions, but health benefits, reduction in obesity and improved school performance.
- We are also working with the Department of Health to promote cycling. They are contributing financially to the programme of work led by Cycling England as well as a detailed evaluation of its impacts.
- We, in turn, are supporting the Department of Health Change for Life campaign, helping to develop the Bike4Life toolkit and ensuring everyday walking and cycling are recognised as playing their part in increasing people's physical activity levels.
- With the Department for Business Innovation and Skills, we are aiming to maximise the benefits for the UK of the transition to ultra-low emissions vehicles.
- With Communities and Local Government we work closely to align both the planning system and the performance framework for local authorities with our transport goals.
- And with the Department of Energy and Climate Change, measures we promote to increase fuel efficiency and diversify transport energy sources will have positive impacts on energy security goals; and the steps taken to decarbonise the energy generating sector will offer greater potential for



decarbonising transport resulting from a further electrification of the railways and on the roads.

- 7.8** Beyond these areas, government takes many wider decisions outside the development of transport policy that will affect transport demand and use. Policies on planning, regional development, regeneration, housing, education and healthcare can all have direct or indirect impacts on the need for travel. For this reason we are also committed to improving the way that central government departments work together on the collective effort to reduce emissions.
- 7.9** Alongside this strategy, the Department of Energy and Climate Change have published carbon budgets for central government departments. The guiding principles behind this pilot process are that all policy makers should take account of their influence on emissions across all sectors, and work collectively to reduce emissions in line with the UK's carbon budgets. Through this step, the Government has recognised that a range of other central government departments have a stake in, or influence over, transport emissions. We will work with them towards the joint goal of reducing emissions from transport.

## Regional and local partners

- 7.10** Almost all journeys take place at least in part on infrastructure or services which are the responsibility of local authorities. They have the opportunity to affect emissions through the transport services they provide, the schemes and ways of travelling they promote, and the way they manage their networks.
- 7.11** Local authorities and regions can also have an important role in encouraging the take-up of new technologies. For example, parking discounts or conditions in planning decisions can affect the choices people make about vehicles. It is for individual authorities to consider whether these are appropriate in their areas. In addition, local authorities are significant providers of transport, making many decisions about vehicle purchase and specification.
- 7.12** More widely, local and regional partners take decisions on an extensive range of issues – including spatial planning and where housing and economic development take place; or the location of schools, hospitals and the way in which other services are delivered. They are also major employers in their own right, able to influence how their own staff travel to or during work. All of these decisions fundamentally affect the choices people make about where and how to travel.
- 7.13** We will work with other departments and our regional and local partners to ensure they can maximise their contribution to the climate change agenda

across all of their operations and responsibilities. Local Transport Plans, Local Area Agreements and Integrated Regional Strategies provide the framework for taking this forward.

## Industry and business

- 7.14** Across all transport industries, we want to maintain and develop the constructive relationships we have forged in working on the CO<sub>2</sub> agenda – be that via the design of regulations, promoting research and development or sharing knowledge and expertise.
- 7.15** Crucial to the success of this strategy are the innovators responsible for developing new technology. We believe strongly that the UK has the resource and resolution to make the most of the opportunities this presents. This will rely on industry prioritising the development and commercialisation of the innovative technologies needed in order to meet our climate change goals.
- 7.16** For example, in aviation we are encouraging the industry to address its environmental impacts through international standards for fuel efficiency and setting a UK target for CO<sub>2</sub> emissions. For road vehicles the existing EU regulation for cars, and expected regulation for vans, will send similar signals to industry to innovate.
- 7.17** In all organisations for whom transport represents a significant cost, there will already be incentives to increase operational efficiencies, or to invest in more fuel-efficient vehicles, technologies and infrastructure. We will work with these organisations to maximise and accelerate the uptake of these strategies.
- 7.18** Given the integral role of transport in supply and logistics, we encourage the sharing of best practice and collaboration within and across the transport supply chain, as well as the pursuit of opportunities for collaborative investment. We welcome efforts from the logistics sector to work with us to ensure consistency in how the transport supply chain measures and reports on its CO<sub>2</sub> emissions.
- 7.19** We encourage employers to consider what measures can be taken to reduce the carbon footprint of trips made on business and in the journey to work. Decisions on if, when, and how we travel can all have a significant impact on transport emissions overall.
- 7.20** Transport is not on the whole a stand-alone activity – demand is substantially derived from other activities, shaped by social, economic and cultural factors.

- 7.21** Demand generators, for example in the retail and leisure sectors, can assist in the work of this strategy by considering how they can become low carbon travel destinations – understanding the travel patterns of their customers and bearing in mind options like providing good cycle parking facilities, scope for electric vehicle charging infrastructure and improving public transport links by coordinating with local transport operators.

## Individuals

- 7.22** The Government is committed to supporting and fostering a good, strong public transport system in this country – to help people get around and to identify lower carbon options for how they travel.
- 7.23** As well as the information made available by individual operators about the services they run, Government is helping individuals to reduce the carbon intensity of their journeys.
- 7.24** Travel can be a necessity but there may be opportunities to access the goods and services that we need in other ways.
- 7.25** When we do need to travel, we can consider whether a lower carbon option is available to us – these may also reduce costs or have benefits for quality of life, for example in a shift to more active modes.
- 7.26** The Government has developed tools like the ACT ON CO<sub>2</sub> carbon calculator and the Transport Direct journey planner to give general and specific advice on routes, modes and associated carbon impacts.
- 7.27** While it is not a substitute for reducing emissions, carbon offsetting can play a useful role as part of a wider package of measures, providing schemes can be properly certified. The new quality assurance scheme for offsetting products, launched under the ACT ON CO<sub>2</sub> banner earlier this year, means that people can purchase products with confidence when, for example, they are seeking to offset the impacts of air trips that they need to make.
- 7.28** Finally, we can have a major influence on our carbon footprint in the choices we make about the vehicles we use, or in the ways in which we use them. ACT ON CO<sub>2</sub> supplies information to enable people to make informed decisions about buying lower carbon cars, and to encourage driving in a more fuel efficient way to reduce CO<sub>2</sub> emissions and other pollutants.

## Action by the Devolved Administrations

- 7.29** The Devolved Administrations are pursuing strategies and plans consistent with the aims of this strategy.

## **Wales**

- 7.30** The Wales Transport Strategy was published in 2008. In addition, the National Transport Plan and the Transport Consortia's Regional Transport Plans are being developed. These will set out how the Welsh Assembly Government will meet its objectives up to 2030. It is anticipated that the final Regional Transport Plans will be in place by December 2009.
- 7.31** The Assembly Government and partners are working to encourage people to make choices that will help reduce their carbon footprint and their car usage. This includes enhanced provision for walking and cycling, as well as public transport, park and ride, high occupancy vehicle lanes and the promotion of eco-driving techniques. The Welsh Assembly Government has Action Plans and targets to support this and has announced plans for developing Sustainable Travel Towns in Wales. These will target a series of focused 'smarter choice' interventions.
- 7.32** The Welsh Assembly Government has announced plans for developing Sustainable Travel Towns in Wales. These will target a series of focused smarter choice interventions that will encourage more people to walk and cycle and to use public transport.
- 7.33** It also proposes to develop key strategic park and ride sites along the main traffic corridors in Wales which will reduce congestion as well as making public transport services more accessible to commuters encouraging modal shift away from car usage.
- 7.34** The Welsh Assembly Government is also planning to establish a centre for inter-modal freight logistics, which would create maximum efficiencies with the freight sector.

## **Scotland**

- 7.35** The Scottish Government's plan, *Meeting Scotland's Statutory Climate Change Targets*, shows that up to 2020, strong demand management measures will be needed. Significant uptake of low carbon vehicles, coupled with smarter travel, should contribute towards a 50 per cent reduction in land transport emissions by 2030. Further vehicle changes, coupled with the potential development of alternative fuels should make a 90 per cent reduction in land transport emissions feasible by 2050.
- 7.36** Scotland's National Transport Strategy commits to develop a Carbon Account for Transport, to monitor progress, and show which transport policies are forecast to have the most impact.
- 7.37** The Scottish Government launched a consultation in June 2009 on how to accelerate the development and uptake of low carbon vehicles and possible

targets to be set. Work is underway to benchmark the Scottish public sector fleet, and to identify potential for greener vehicle procurement.<sup>71</sup>

- 7.38** 'Smarter Choices, Smarter Places' is a partnership project which makes up to £15 million available, over three years, for seven Local Authorities to improve public transport services, walking and cycling infrastructure, and intensive marketing and awareness campaigns. The Scottish Government's draft 'Cycling Action Plan for Scotland' is being consulted upon over summer 2009 and proposes a target of 10 per cent of all journeys made by bike by 2020. The Scottish Government also makes funding available to organisations, including Local Authorities, to promote active travel initiatives.
- 7.39** The Scottish Government funds the Energy Saving Trust to engage individuals and organisations. The Trust and the Energy Saving Scotland Advice Network promote eco-driving. The Trust provides free, bespoke advice on fleets (Green Fleet Reviews) and Travel Plans. Additional support on Travel Plans and Smarter Choices initiatives are provided by Travel Plan officers in each Regional Transport Partnership.
- 7.40** The Scottish Government is reviewing the bus subsidy, paid as Bus Service Operators Grant, to link it more closely to reduced environmental impact.
- 7.41** The Scottish Government is investing over £500,000 in 2008–11 in extending the Freight Best Practice Programme into Scotland as part of its support for the freight industry. As part of the UK-wide Sustainable Rail Programme, the Scottish Government is planning a rolling programme of electrification of Scotland's railways and greater efficiency from the whole of the rail sector.
- 7.42** A major review of Scottish ferry provision is currently underway, to identify options for significant emission reduction measures. Alternative fuels and innovative vessel design measures are being considered as part of the review.
- 7.43** Emissions from domestic and international aviation are included in the Scottish Government's Climate Change Bill.

### **Northern Ireland**

- 7.44** Road transport is the largest source of CO<sub>2</sub> emissions in the North of Ireland, accounting for 29 per cent of total carbon emissions. Delivering reductions in greenhouse gas emissions from road transport, while ensuring the provision of transport arrangements that meet economic and social needs, presents a significant challenge. Reconciling these potentially competing priorities is a key objective for Northern Ireland.

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<sup>71</sup> Scottish Government (2009) *Consultation on Low Carbon Vehicles*, <http://www.scotland.gov.uk/Publications/2009/06/25103442/0>

- 7.45** The Executive and Assembly recognise the real need to reduce greenhouse gas emissions across the transport sector to meet the challenge of climate change. The Programme for Government which sets out the Executive's strategic priorities and key plans for 2008–2011, in line with the Sustainable Development Strategy published on 25 February 2008, has set an ambitious target for a reduction in local emissions of greenhouse gases. To contribute fully to realisation of the Programme for Government target, a substantial reduction is required on 2006 greenhouse gas emissions from road transport by 2025.
- 7.46** The immediate priority is to establish the baseline greenhouse gas emissions from transport and the options for reduction. The Regional Transportation Strategy 2002–2012 is currently being reviewed to enhance the suite of policy and operational measures needed to ensure that future transport arrangements are more sustainable.
- 7.47** The Executive and Assembly's current investment plans – set out in the Investment Strategy for 2008–2018 – envisage a significant level of investment in public transport, including the Belfast Rapid Transit project. Planned investment in buses, trains and facilities aims to promote increased utilisation of public transport and reduce dependency on the private car, thereby contributing to climate change targets. To facilitate progress in this area, action will continue to promote behavioural change and more sustainable modes of travel.







