



Proposed Emissions Related Congestion Charging

Public and Stakeholder Consultation

**Detailed Scheme Description and
Supplementary Information**

August 2007

Table of Contents

1	Introduction.....	3
2	Background.....	5
3	Description of the proposals	16
3.1	Operation of the proposals	17
3.2	Low CO ₂ discount.....	19
3.3	Higher charge (£25) for highest CO ₂ emitting cars and extended-cab dual purpose pickups	19
3.4	Standard charge (£8).....	22
3.5	Discontinuation of the alternative fuel discount	23
3.6	Interaction with other Congestion Charging discounts and exemptions	24
3.7	Monthly and annual charges	27
3.8	Euro V heavy vehicle discount	28
4	Impacts of the proposals	30
4.1	Environmental impacts	33
4.2	Social impacts	37
4.3	Business impacts.....	39
4.4	Evaluation of the impacts of the proposals	41
4.5	Monitoring the impacts of the proposals	44
5	Indicative timetable and next steps	47
	Appendix A: Vehicles in London	49
	Appendix B: Map of extended Central London Congestion Charging Zone	56

1 Introduction

- 1.1 The Mayor of London is extremely concerned about the major challenge of climate change. The Mayor's Transport Strategy states that the reduction of greenhouse gases is a critical issue which the strategy must address. It also states that the Mayor wants to make sure that London plays its part in meeting climate change targets. The Mayor's Climate Change Action Plan highlights that opportunities to reduce carbon dioxide (CO₂) emissions from transport are being pursued in London on a greater scale than in most other cities – but it emphasises that efforts will have to increase substantially if CO₂ reduction targets are to be met.
- 1.2 One way to help tackle CO₂ emissions from private road transport is through promoting a switch to vehicles which emit lower levels of CO₂. As part of a range of measures set out in his Climate Change Action Plan to reduce London's CO₂ emissions and to encourage behavioural change, the Mayor announced that he would like to introduce emissions related congestion charges to the central London Congestion Charging Scheme. These would seek to discourage the use of the highest CO₂ emitting cars, encourage the purchase of lower CO₂ emitting cars and increase people's awareness of the impact of their individual choices on the environment.
- 1.3 The proposals could also provide an example to other authorities which may be considering such initiatives. Increased awareness, in London and beyond, of the impact of individual choices on the environment and wider implementation of measures to promote behavioural change could have significant longer-term benefits.
- 1.4 Schedule 23 of the Greater London Authority Act 1999 states that 'A charging scheme must be in conformity with the Mayor's Transport Strategy'. The primary focus of the Congestion Charging scheme remains to reduce congestion within the Congestion Charging zone. Congestion charging has already contributed to reduced CO₂ emissions by discouraging a proportion of trips to the zone and enabling the remaining traffic to flow more easily.
- 1.5 These proposals are consistent with the Mayor's Transport Strategy. Alongside the continuing objective of reducing congestion, the proposals seek to contribute to the vision of making London 'a green city'. As explained in the executive summary of the Transport Strategy, 'the Strategy will encourage a shift to greener, more efficient travel options, and seek improvements to the environmental performance of all forms of transport'.
- 1.6 These proposals are innovative. If they are introduced, Transport for London (TfL) will review the scheme by 2010. The scheme could be readily adapted in light of fuller understanding of the effects – using data from the extensive monitoring of the scheme. This will ensure that, alongside the aim of promoting a switch to lower emitting cars, the primary traffic benefits of the scheme are not compromised.
- 1.7 Transport for London (TfL) is consulting the public and stakeholders on a Variation Order to the central London Congestion Charging Scheme that would introduce such charges.

1.8 Following this consultation, the Mayor will decide whether or not to go ahead with the proposals and whether to confirm the Variation Order, with or without modifications, that would formally implement the proposals.

1.9 This document provides detailed information on:

- the principle of emissions related congestion charges;
- a description of the proposals, including the vehicles affected;
- a description of the additional proposal to introduce a Euro V heavy vehicle discount to the Congestion Charge to complement the Greater London Low Emission Zone;
- interactions with other Congestion Charging discounts;
- projected impacts of the emissions related congestion charging proposals; and
- an indicative timeline and next steps.

This document provides a greater depth of information than is provided in the Variation Order and associated Explanatory Notes, which are primarily legal documents. It aims to facilitate greater understanding of the emissions related congestion charging proposals, thereby informing the consultation process.

2 Background

- 2.1 An overwhelming body of scientific evidence now clearly indicates that climate change is a serious and urgent issue. The Intergovernmental Panel on Climate Change has concluded that there is new and stronger evidence that most of the changes in the world's climate observed over at least the past 50 years are attributable to human activities.
- 2.2 Mean global temperatures are likely to rise between 1.1°C and 6.4°C (with a best estimate of 1.8°C to 4°C) above 1990 levels by the end of this century, depending on emissions of greenhouse gases. This could result in a further rise in global sea levels of between 20cm and 60cm by the end of this century, continued melting of ice caps, glaciers and sea ice, changes in rainfall patterns and intensification of tropical cyclones¹. In the UK, for a global temperature rise of 3°C, temperatures in London could be up to 7°C warmer than today because of the combined effect of climate change and the urban heat island effect². Furthermore, with temperature increases of 3°C to 4°C, London would be at increased risk from rising sea levels.
- 2.3 CO₂ is the most important of the greenhouse gases which are contributing to climate change. The Mayor has therefore made cutting CO₂ emissions a major priority. The other main greenhouse gases are methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.
- 2.4 In 2006 London produced 44 million tonnes of CO₂ from the consumption of energy in the domestic, commercial, industrial and ground transport sectors. This represents eight per cent of total UK emissions from these sources. Unless action is taken now, emissions are set to increase substantially. Given forecast economic and population growth, it is projected that London's overall emissions could increase by 15 per cent to around 50 million tonnes by 2025.
- 2.5 The UK Government's 2006 Climate Change Programme builds on the domestic emissions reduction targets that were set in 2000, based on the Kyoto Protocol, which sets legally binding emissions reduction targets for national governments. This Programme sets out the policies and priorities for action across all sectors in the UK and internationally to achieve these reductions. It outlines the crucial role played by all parts of the public sector (local, regional and central) in influencing the context within which progress can be made.
- 2.6 The consultation period on the UK Government's draft Climate Change Bill ended recently. The Bill sets out a framework for moving the UK to a low-carbon economy and sets statutory targets for a 60 per cent reduction in CO₂ emissions by 2050 and a 26 to 32 per cent reduction (below 1990 levels) by 2020.

¹ Intergovernmental Panel on Climate Change Fourth Assessment Report (2001). This conclusion has been supported by the multinational Joint Statement of Science Academies in 2005 and a report from the US Climate Change Science Program in 2006.

² London Climate Change Partnership (2004) cited by the Stern Report, <http://www.hm-treasury.gov.uk>

- 2.7 In order to stabilise atmospheric CO₂ concentrations at 450 parts per million (ppm), London will have to limit the total amount of CO₂ it produces between now and 2025 to about 600 million tonnes. The Stern Review on the Economics of Climate Change was commissioned by the UK Government and reported in 2006. It highlighted 450ppm CO₂ as a potential stabilisation target while the Tyndall Centre's 'Living with a Carbon Budget' identified 450ppm CO₂ as the maximum targeted atmospheric concentration. This implies a target of stabilising London and the UK's emissions at 60 per cent below 1990 levels by 2025, a more challenging target than that set nationally.
- 2.8 The Mayor's Climate Change Action Plan adopts this target and prioritises actions across all sectors to achieve it. The Climate Change Action Plan sets out actions to reduce emissions from existing homes, existing commercial and public sector activity, new build and development, energy supply, ground based transport and within the Mayoral group itself: the Greater London Authority; the London Development Agency; Transport for London and London's fire and police services. The Mayor's top priority for reducing CO₂ emissions is to move as much of London as possible away from reliance on the national grid towards local, lower-carbon energy supply, energy from waste and on-site renewable energy. The targeted reductions also require national action and the Climate Change Action Plan states that the Mayor will work with the Government to introduce a comprehensive system of carbon pricing.
- 2.9 The Stern Review reported that the social, environmental and economic costs of climate change could be huge. The Review concluded that the benefits of strong early action to tackle climate change considerably outweigh the costs. It emphasises that policy to reduce emissions should be based on three essential elements: carbon pricing; technology policy; and removal of barriers to behavioural change. Emissions related congestion charging could reflect two of these essential elements, namely: carbon pricing, by introducing an emissions related element to the Congestion Charging scheme; and technology policy, by incentivising market investment in technology to produce lower CO₂ emitting cars. It would also encourage behavioural change – a key focus of the Mayor's Climate Change Action Plan.
- 2.10 A tonne of carbon has a social cost (central value) of around £85 and it is advised that this value increases in real terms by £1 per tonne per year. This is based on the values derived for the Department of Food, Environment and Rural Affairs in the Government Economic Service working paper 'Estimating the Social Cost of Carbon Emissions', 2002. It was re-confirmed by the Department in 2006 in the light of research for the Stern Review. With this value, a tonne of CO₂ has a social cost (central value) of around £25 at 2007 values and prices, which increases in future years.
- 2.11 The Intergovernmental Panel on Climate Change made reference to a range of values from US \$10 to US \$100 per tonne for the social costs of CO₂; which is broadly equivalent to £5 to £50 per tonne. This places the UK Government central value at about the mid-point of this range. Using the UK Government value, London's CO₂ therefore has an overall social cost of around £1 billion per year at 2007 values and prices.

Road transport as a source of CO₂ emissions

- 2.12 Ground based transport is a significant source of CO₂ emissions in London, representing 22 per cent of emissions, and is the third largest contributor of CO₂ emissions after domestic (38 per cent) and commercial (33 per cent) sources. Within London there are currently around 27 million trips per day, resulting in CO₂ emissions of around 10 million tonnes per year.
- 2.13 As can be seen in Figure 2.1, cars and motorcycles account for around half of these emissions. Public transport contributes a relatively small proportion, with bus, taxi and private hire vehicles (PHVs), the Underground and National Rail contributing around five per cent each of the CO₂ emissions from transport in London. Using a social cost of CO₂ of £25 per tonne means that road transport CO₂ emissions are imposing costs of about £200 million per year. The social cost of CO₂ from cars in London is therefore around £100 million per year.

Figure 2.1: CO₂ emissions from transport in London

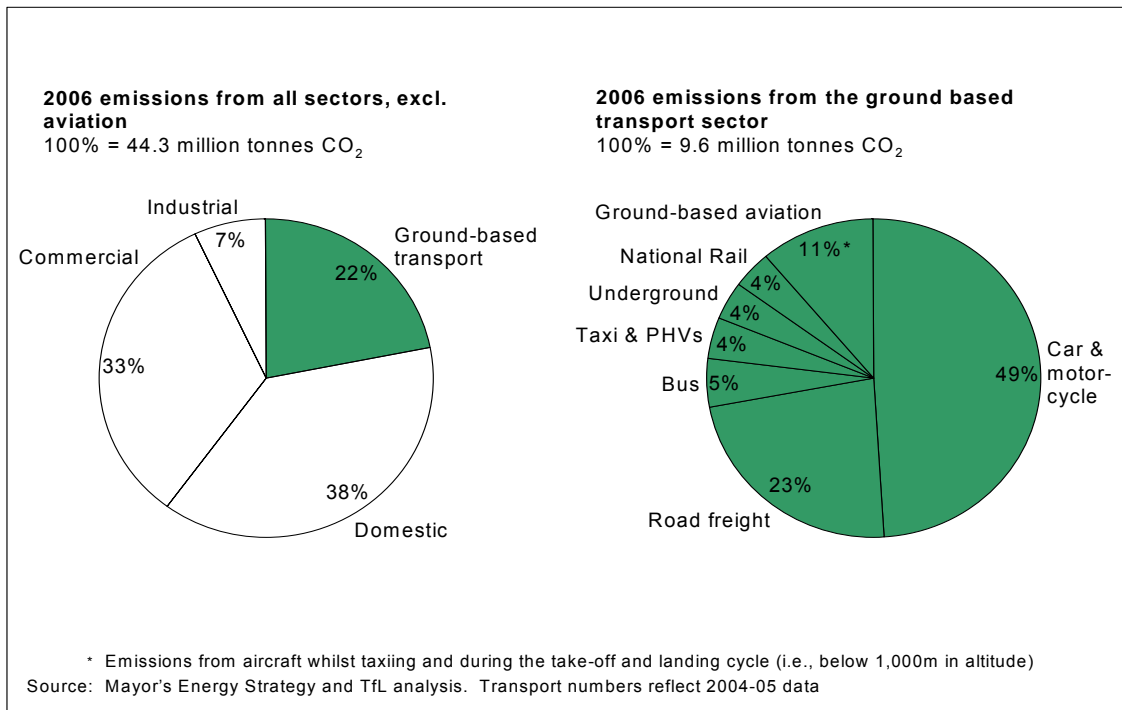
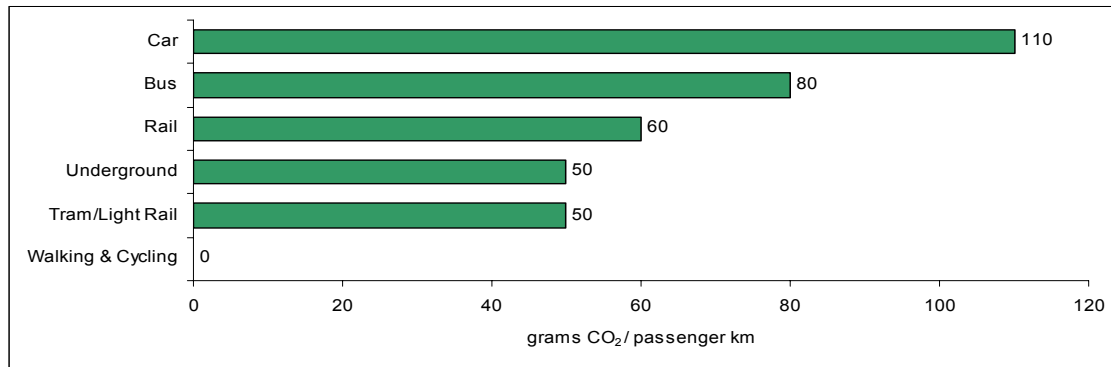


Figure 2.2: Average CO₂ emitted per passenger kilometre, various transport modes



Note: calculated using current London-wide load factors (15 passengers per bus, 1.6 occupants per car)

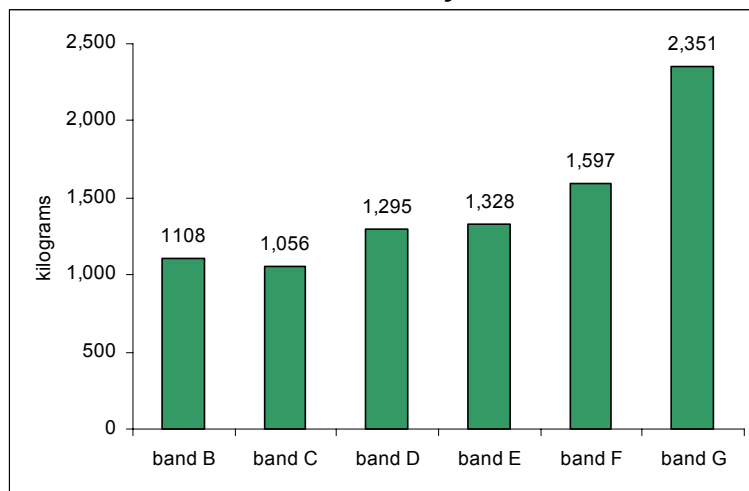
- 2.14 TfL is introducing measures to reduce CO₂ emissions from the public transport modes. These include training bus drivers to operate their vehicles more fuel efficiently and investment in new bus technologies, including trials of hydrogen buses and the introduction into the fleet of hybrid diesel-electric buses. Opportunities for improving energy efficiency are being considered during London Underground station improvements and track upgrades and TfL plans to increase the amount of energy procured through renewable electricity tariffs.
- 2.15 While the Mayor is well placed to deliver a reduction in CO₂ emissions from most parts of the public transport network in London, he has less control over emissions from cars. As can be seen in Figure 2.2, these are significant and need to be tackled. One mechanism the Mayor does have for influencing driver behaviour is the Congestion Charging scheme.

CO₂ emissions from cars

- 2.16 As can be seen in Figure 2.2, cars in London on average emit the most CO₂ per passenger kilometre of all personal transport modes. A car being driven 15,000 kilometres per year will typically emit 2.5 to 3.0 tonnes of CO₂ per year.
- 2.17 In 2005 the average new car in London emitted around 180g/km of CO₂, which was higher than the national average of around 170g/km. While there has been a decrease nationally of around 11 per cent in average new car CO₂ emissions between 1997 and 2005, progress has been slower in London over the last five years (to 2005) with a four per cent reduction.
- 2.18 The CO₂ performance of a car can vary considerably depending on a number of factors including engine type, engine size, vehicle weight and the type of fuel. A heavier 4x4 or sport utility vehicle will have considerably higher CO₂ emissions than a smaller car. For example, a Toyota Landcruiser 4.0 VVT-i V6 (petrol) has CO₂ emissions of 291g/km while a much smaller Toyota Aygo 1.0 VVT-i (petrol) has emissions of 109g/km.

2.19 The annual vehicle excise duty (VED) paid on cars is now varied according to bands based on a car's CO₂ emissions: band A has the lowest CO₂ emissions; band G has the highest. An analysis of the top three selling cars in each VED band indicates that band G cars are typically around 45 per cent heavier than band F cars and 110 per cent heavier than band B cars. Figure 2.3 below suggests that band B cars currently sold are on average slightly heavier than band C cars. This is due to sales of the Toyota Prius, which in 2006 represented over 20 per cent of the total new band B registrations in London, but which has a weight of 1,300 kilograms. This is heavier than conventional petrol and diesel cars in bands B and C.

Figure 2.3: Average kerb weights for top three selling cars, nationally, in each vehicle excise duty band



Data source: Experian 2007

- 2.20 Diesel cars produce around 20 per cent less CO₂ emissions than petrol cars, mainly because of the higher efficiency of diesel engines. For example, the Volkswagen Beetle 1.9TDi with a diesel engine has CO₂ emissions of 143g/km compared with 194g/km for the 1.8T petrol engine. However, diesel engines produce significantly higher levels than petrol engines of other emissions that have a more adverse impact on air quality and health.
- 2.21 Experts predict that petrol and diesel powered internal combustion engines are likely to remain the main form of technology in new cars for some time. However, with the potential increase in new technologies, the share of conventional petrol and diesel would reduce to around two thirds by 2020.
- 2.22 Hybrid vehicles, which combine an internal combustion engine with an electric motor or battery, tend to offer reduced fuel consumption and CO₂ emissions, and potentially improved air quality emissions, particularly with urban stop-start driving. Other new technologies include battery electric and fuel cells, which offer zero exhaust emissions.

- 2.23 The majority of the life cycle impacts of vehicles and fuels arise from the use of the vehicle rather than its manufacture. Exhaust emissions for conventional petrol, diesel, natural gas, liquid petroleum gas and petrol-hybrid vehicles account for around 80 per cent of the life cycle CO₂ emissions from the vehicle; while emissions from the manufacture of the vehicle and fuel are much lower at around 20 per cent. The ratio of CO₂ emissions between vehicle and fuel manufacture and vehicle operation are the same regardless of the size of the car, although a larger car will emit more overall life cycle CO₂ for all fuel types than a smaller car. For battery electric and fuel cell technology, the emissions from the manufacture and production account for all life cycle emissions.
- 2.24 Hybrid technologies are likely to have a longer lead time before taking a larger share of the new car market, reaching around five per cent by 2020. Gas-to-liquid technology, whereby natural gas is turned into a liquid fuel that can be handled at normal temperatures and has a lower carbon content, is likely to emerge more significantly from 2010 with a projected market share of 10 per cent of new cars by 2015 and around 13 per cent by 2020. Fuel cells and battery vehicles are likely to have a much longer timeframe, reaching less than one per cent by 2020, but increasing after this time.
- 2.25 Biofuels (biodiesel or ethanol) can potentially offer a means of reducing a vehicle's impact on climate change. Biofuels are produced from renewable sources, such as biomass or waste oil. However, biofuels do not necessarily achieve a reduction in CO₂ emissions reflected at the exhaust and it is currently difficult to ensure that a particular biofuel has a positive CO₂ benefit. The source of the organic feedstock and production methods can have a significant impact on the net CO₂ saving, in some cases yielding no saving at all. For example, corn-based ethanol production in the USA, which has little or no CO₂ benefit compared to fossil fuels, is sold on equal terms as Brazilian ethanol made from sugar cane, which is easier to grow and process and achieves an 80 to 90 per cent reduction in CO₂ emissions.
- 2.26 Biofuels are not included in the existing alternative fuel discount that applies to certain vehicles for the Congestion Charging scheme, because a recognised biofuel accreditation system is not in place and this would be required before TfL could recognise the life cycle benefits of biofuels. Furthermore, most vehicles can operate on a mix of petrol and ethanol or diesel and biodiesel and this is likely to increase in the future. Such vehicle owners can use either biofuel or conventional fuel in their cars, and there would be no practical way of determining which fuel has been used. TfL, therefore, does not intend to offer such vehicles a discount from the Congestion Charge under the emissions related congestion charging proposals.

- 2.27 The UK Government is encouraging the development of the biofuel industry through the Renewable Transport Fuel Obligation. This requires fuel suppliers to ensure that five per cent of their sales are from renewable sources by 2010. It is expected that the Obligation will start in April 2008, and TfL supports this measure subject to processes being in place to ensure that biofuels are produced in a sustainable manner. The Mayor is encouraged by recently announced details of the proposed Department for Transport biofuel assurance scheme and would support efforts to strengthen the scheme in the future. The Mayoral group will also work with its fuel suppliers to ensure that the biofuels it uses are from high quality, approved sources. Under the Renewable Transport Fuel Obligation, biofuels will play an increasingly significant role in efforts to reduce overall CO₂ emissions from the new car market over the short term. The future role of biofuels in climate change mitigation remains unclear for now, with considerable uncertainty regarding the extent of biofuel production that can be supported sustainably.
- 2.28 The most common fuel type of cars used in the Congestion Charging zone is petrol, accounting for around 70 per cent of cars, followed by diesel at around 30 per cent, although the market share of diesel is currently increasing and diesel made up around 40 per cent of the new car market in the UK in 2005. Alternative fuel types, such as electricity, hybrid electric and fuel cells, currently account for less than one per cent of cars in the Congestion Charging zone.

What has been done at the EU level?

- 2.29 Car manufacturers and governments have been aware of warnings about the impact of greenhouse gases for the last decade. In July 1998 the European Commission and the European Automobile Manufacturers Association agreed to voluntarily reduce the CO₂ emissions from passenger cars by over 25 per cent to an average CO₂ emission figure of 140g/km by 2008. In 2006, around 22 per cent of new cars had CO₂ emissions of less than 140g/km. Vehicle manufacturers will currently not reach this target, although average CO₂ emissions from new cars across Europe have reduced from around 180g/km in 1998 to around 160g/km in 2004. Average CO₂ emissions from new cars are higher in the UK, mainly due to the lower proportion of diesel cars than in continental Europe, but have also reduced over the past decade from 190g/km in 1998/9 to around 170g/km in 2005/06.
- 2.30 In February 2007, the European Commission set out new proposals seeking to reduce the average CO₂ emissions of new cars and vans. The new proposals aim to reach an EU objective of 120g/km average CO₂ emissions from new cars by 2012, a reduction of 25 per cent on current levels, by means of an integrated approach.

- 2.31 Should the proposals be agreed by the European institutions, vehicle manufacturers would probably seek to reach this target by increasing the number of cars manufactured with lower emissions, including manufacturing more diesel cars, in order to reduce the overall average emissions of vehicles. Vehicle manufacturers would also be able to reduce the emissions of new cars through the use of new technologies, including using lightweight materials, hybrids, battery electric, fuel cells and improving internal combustion, although these technologies are more expensive. In addition, to encourage the car industry to compete on the basis of fuel efficiency instead of size and power, the Commission has also invited manufacturers to sign an EU code of good practice on car marketing and advertising.
- 2.32 It is still uncertain whether the European Commission's proposals will be agreed by European governments. If they are agreed, they would have an impact on CO₂ emissions in the longer term by reducing emissions from new cars. However, the proposals will have little impact on CO₂ emissions in the short term.

What has been done elsewhere in the world?

- 2.33 The State of California has been a major innovator in the environmental regulation of motor vehicles, and legislation in California has often influenced legislation in Europe. The California Air Resources Board was established in the 1960s. Its policies and subsequent regulations have had an influence on car manufacturers leading to cleaner cars using conventional technology and the more radical technologies needed to make hybrids and fuel cell vehicles.
- 2.34 While much of the US car industry has resisted California's environmental measures, the new regulations have been approached proactively by Japanese (eg Toyota and Honda) and some European (eg Volvo, BMW and Mercedes) car makers with a significant share of sales in the US. Environmental technologies are beginning to be used more widely as a competitive tool in the vehicle market, as can be seen with the increasing market share of hybrid technology in the Toyota Prius and Honda Civic IMA. However, these vehicles still only represent a very small market share and there is a long way to go before there is a significant reduction in overall CO₂ emissions from road transport as a result of new technologies.

What is being done at the national level?

- 2.35 In the UK, the Government has taken a number of steps to promote the purchase and use of more fuel efficient vehicles. In March 2001, the Government reformed VED, the road tax paid each year by vehicle owners in the UK, to reflect CO₂ emissions. This was introduced to influence the car market through a graduated system whereby new cars that emitted lower levels of CO₂ would be charged a lower rate of VED than cars which emitted higher levels of CO₂. Originally the scheme had four bands with more added progressively. The labelling of the scheme was changed in September 2005 to bands A to F, where band A had the lowest CO₂ emissions. In March 2006, a new zero rate was introduced for cars in band A and a new top band (band G) was introduced for the highest emitting cars, as set out in Figure 2.4.

Figure 2.4: Graduated vehicle excise duty

Cars registered on or after 1 March 2001		Diesel or Petrol car	Alternative Fuel car
Bands	CO ₂ Emission figure (g/km)	12 months rate £	12 months rate £
Band A	Up to 100	0	0
Band B	101 to 120	35	15
Band C	121 to 150	115	95
Band D	151 to 165	140	120
Band E	166 to 185	165	145
Band F	186 and above <i>(registrations from 1 April 2001 to 22 March 2006)</i> 186 to 225 <i>(registrations on or after 23 March 2006)</i>	205	190
Band G	226 and above <i>(registrations on or after 23 March 2006)</i>	300	285

Note: VED rates for vehicle licences taken out after 22 March 2007.

- 2.36 For the purposes of emissions related congestion charging, a car with emissions of 226g/km and above would be subject to the higher charge. This would mean that cars registered between 1 April 2001 and 22 March 2006, considered band F for the purposes of VED, would be considered to be equivalent to band G for the purposes of the emissions related congestion charging proposals. More information on the higher charge can be found in section 3.3.
- 2.37 The VED rate for petrol and diesel cars in band B was reduced to £35 per year and the rate for band G was raised to £300 per year in April 2007. The rate for band G will rise again to £400 per year from April 2008.
- 2.38 In addition to graduated VED, company car tax has, since April 2002, been based on the CO₂ emissions of the vehicle provided to an employee for their private use. This scheme applies to cars registered after January 1997. A new company car tax rate of 10 per cent of a vehicle's value will be introduced from April 2008 for cars in bands A and B. The current lowest rate is 15 per cent for all cars with CO₂ emissions less than 145g/km for cars registered in 2004/05, or less than 140g/km for cars registered from 2005/06. The Government's 2007 Budget also set out an additional 2 per cent discount for cars capable of being run on E85 fuel (ethanol), which became available in April 2007.

- 2.39 Vehicle statistics suggest that the changes in VED and company car tax have had an impact on the number of models on offer in the UK in different bands and on the depreciation rates of vehicles in these VED bands. Company car tax has had the biggest impact on band F cars and generated incentives for company car drivers to shift to cars in bands E, D and C. The new lowest rate for band B cars is also likely to have an impact compared with the current system where the tax rates for band B cars compare with those for bands C and D.
- 2.40 Variable taxes based on CO₂ emissions provide an indication that fiscal policies can influence purchasing behaviour.

What is being done in London?

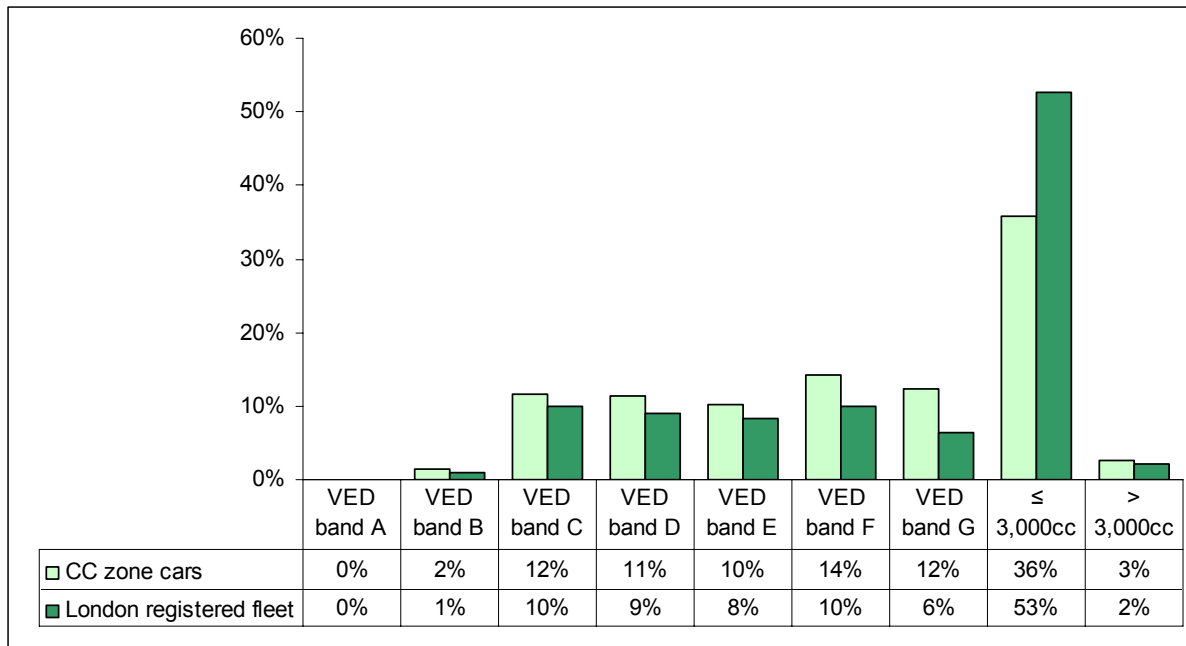
- 2.41 In line with the principle advocated in the Stern Review, the Mayor considers that more widespread carbon pricing will be essential to incentivise demand for low-carbon vehicles and fuels, and to drive innovation in further developing these technologies. The Mayor is keen to build on the successes of the Congestion Charging scheme by introducing emissions related charges to the scheme. This is consistent with his Transport Strategy, which sets out his vision to develop London as an exemplary sustainable world city and recognises that one of the key elements of this vision is the promotion of transport services and patterns of movement that contribute to a reduction in greenhouse gas emissions.
- 2.42 The emissions related congestion charging proposals would take place in the context of wider factors influencing CO₂ emissions from road transport. These include the total amount of kilometres driven, as well as traffic congestion, which affects the efficiency with which a vehicle with specific emission characteristics travels around the road network. In general, more congestion means more CO₂ emissions per unit distance travelled. TfL estimated that the initial traffic and congestion reductions arising from the original central London scheme led to overall CO₂ savings of 16 per cent, although recent congestion trends in central London will have eroded some of this benefit.
- 2.43 However, more recent work by TfL suggests that the original estimate was likely to have understated the savings made. This is because the decongestion effects of the scheme are particularly focused on reducing the time that vehicles spend stationary in queues or moving very slowly (ie operating least efficiently), as opposed to increasing actual driving speeds. In turn, this means that conventional 'emissions factors' for CO₂ are likely to underestimate the scale of CO₂ reductions that are possible under particularly congested urban conditions. TfL has commissioned work to examine this further, with a view to developing a revised emissions assessment methodology for CO₂ to better reflect conditions in central London.
- 2.44 London has a good record in addressing climate change compared with many other cities. The Mayor has had success in achieving a modal shift away from private cars to public transport, walking and cycling with the Congestion Charging scheme. However, continued population and economic growth in London could lead to an increase in emissions if CO₂ reduction measures are not pursued across all modes.

- 2.45 TfL's Transport 2025 report, published in 2006, sets out a long-term vision for London's transport system and emphasises the importance of reducing CO₂ emissions from road transport sources. It includes a package of measures to encourage a modal shift from car travel, and to reduce traffic congestion and CO₂ emissions. The report illustrates the role that charging in favour of vehicles with lower emissions could have to address emissions from private road transport vehicles.
- 2.46 The Mayor's Climate Change Action Plan, published in 2007, sets out a number of mechanisms for reducing emissions from transport:
- Changing the way Londoners travel with continued investment in public transport, walking and cycling to provide attractive alternatives to the car and promoting alternatives to the car through marketing, information and travel demand policies
 - Operating vehicles more efficiently by promoting eco-driving by all car, freight, taxi and public transport drivers
 - Promoting low-carbon vehicles and fuels
 - Carbon pricing for transport, including emissions related congestion charges.
- 2.47 The Action Plan emphasises the importance of behavioural change and the need for individuals to make more sustainable choices. It highlights the opportunity and obligation for London to provide leadership for other national and international cities. The Congestion Charging zone covers a relatively small area but its influence extends more widely. These proposals could help to influence thinking and policy development both within the UK and internationally and should help to encourage greater awareness of the need for action. Many cities look to London as they seek to develop their own policies and these proposals could pave the way for further initiatives which could effect wider behavioural change.
- 2.48 Since the Mayor's announcement of his plans regarding emissions related charges in November 2006, a number of local authorities have implemented, or are considering implementing, local carbon pricing initiatives. The London boroughs of Richmond upon Thames, Lambeth and Hackney have introduced variable charges for residents' parking permits based on a car's CO₂ emissions and/or engine size. Other boroughs, including Camden, Islington and Haringey, have recently consulted on similar schemes and more boroughs are known to be considering such schemes.

3 Description of the proposals

- 3.0.1 The proposals for emissions related congestion charges would introduce a 100 per cent discount for the lowest emitting cars, in terms of CO₂ and emissions that affect local air quality. They would also introduce a higher £25 daily charge for the highest CO₂ emitting cars. The accepted CO₂ emissions figure for these proposals is the level declared by the manufacturer, to the relevant authority, for that model of vehicle as part of the type approval process.
- 3.0.2 If the proposals were implemented, the scheme would be reviewed by 2010. This would consider both the low CO₂ discount (in terms of level and eligibility criteria) and also the higher charge. If appropriate, modifications could be made in order to ensure that the charging structure is effective in terms of decongestion benefits as well as promoting lower CO₂ emitting cars. Any proposed amendments to the scheme would be subject to full public and stakeholder consultation.
- 3.0.3 The proposals are focused on passenger cars (and also extended-cab dual purpose pickups that are increasingly used as passenger vehicles) rather than commercial vehicles. Drivers of passenger cars have more choice in the type of vehicle they drive and therefore in the emissions of that vehicle. There is little choice for operators of commercial vehicles in terms of CO₂ emissions. However, the separate proposal for a Euro V heavy vehicle discount, to complement the Greater London Low Emission Zone, would provide an incentive for operators of commercial vehicles to purchase vehicles with the lowest air quality emissions.
- 3.0.4 Around 20 per cent of cars in London are used for trips – at least occasionally – within the extended central London Congestion Charging zone. Cars using the Congestion Charging zone tend to be newer than London's overall car fleet. Around one third of cars in the zone are less than three years old compared with around 20 per cent of cars registered in London, while fewer than 10 per cent of cars in the zone are more than 10 years old compared with around 27 per cent of cars registered in London.
- 3.0.5 Furthermore, cars in the Congestion Charging zone also tend to have higher CO₂ emissions than the national and London fleet. As can be seen in Figure 3.1, there is a higher proportion of the highest CO₂ emitting cars – band G or equivalent – in the zone (12 per cent) than in the London registered fleet (six per cent). There is also a slightly higher proportion of the lowest CO₂ emitting cars in the zone than in the London registered fleet. More information on the vehicle fleet in London is provided in Appendix A.

Figure 3.1: Comparison of cars registered in London and cars in the Congestion Charging zone by VED band (post-March 2001 registrations) and engine capacity (pre-March 2001 registrations)



Note: VED band G here means band G and equivalents ie all cars registered on or after 1 March 2001 with CO₂ emissions of 226g/km and above.

3.0.6 The primary objective of the Congestion Charge remains to reduce congestion in central London, which in turn assists in the reduction of CO₂. TfL would therefore review the scheme by 2010, to ensure that congestion benefits were not being inappropriately undermined. At that time, if monitoring showed that wider benefits were being compromised, changes to the scheme would be brought forward. The review could consider, for example, changing the level of the discount or eligibility criteria. Any such proposed amendment to the scheme would have to be consistent with the Mayor's Transport Strategy and would require a Variation Order which would be subject to full public and stakeholder consultation.

3.1 Operation of the proposals

3.1.1 The proposals would apply to the Congestion Charging zone and would operate within the charging hours of 7.00am to 6.00pm, Monday to Friday, excluding public holidays. There would be no change to the Congestion Charging traffic signs. No additional signs, cameras or other infrastructure are required for these proposals. The 'free through route' and uncharged boundary roads would remain uncharged. A map of the Congestion Charging zone is provided at Appendix B.



- 3.1.2 The proposals would overlay the current Congestion Charging scheme and thus operate in the same way. TfL would continue to use automatic number plate recognition cameras, both fixed and mobile, to read a vehicle's registration number. This is then checked against the database of those vehicles for which a charge has been paid or those that are not liable to the charge because they are exempt or registered for a 100 per cent discount. Once the vehicle registration number has been matched, images of the vehicle are automatically deleted from the database.
- 3.1.3 TfL would determine a car's CO₂ emissions category using data held by the Driver and Vehicle Licensing Agency (DVLA). Since March 2001, the level of VED for passenger cars has been determined by their CO₂ emissions. This means the DVLA has CO₂ data recorded for cars registered after March 2001. For cars registered before March 2001, TfL would use engine size as a proxy for CO₂ emissions.
- 3.1.4 The proposals would use Euro standards to determine the criteria for emissions that affect local air quality for the low CO₂ discount. These are European standards which set limits for exhaust emissions for new vehicles sold in Europe, and which all vehicles must comply with when manufactured. To be eligible for the 100 per cent discount, a car must meet the Euro 4 standard, as well as having CO₂ emissions of 120g/km or less.
- 3.1.5 There are a number of ways in which drivers would be able to establish their car's CO₂ emissions or engine capacity (if the car was registered before 1 March 2001). For cars registered on or after 1 March 2001, CO₂ emissions data and engine size are available on the car's registration certificate, known as a V5C (in section 4 which sets out the vehicle details). This also provides information on the level of exhaust emissions, but does not specify the Euro air quality standard of the car. The Euro 4 standard for cars was implemented on 1 January 2005. TfL would therefore consider that any car first registered on or after 1 January 2005 met the Euro 4 standard. The Euro standard is also stated on the vehicle's type approval certificate, issued by the manufacturer. For cars registered before 1 March 2001, the engine size is specified on the V5C.
- 3.1.6 Drivers of current car models, or drivers considering purchasing a new or current car model, can also determine a car's CO₂ emissions and Euro standard on the Vehicle Certification Agency website at www.vcacarfueldata.org.uk. Most vehicle manufacturers now also provide CO₂ emissions information on a colour coded label for new cars in UK car show rooms, which uses categories consistent with the VED bands. In addition, a new government website has been launched to help car buyers compare the CO₂ emissions of new cars and determine the most fuel efficient model in each car class, as well as providing driving tips to help reduce CO₂ emissions. The website (Act on CO₂) is available at www.dft.gov.uk/actonco2.
- 3.1.7 If the Mayor confirms the emissions related congestion charging proposals, TfL would set up an on-line and telephone checking facility that would enable drivers to understand their eligibility for the low CO₂ discount or the level of daily charge for which their vehicle would be liable.

3.2 Low CO₂ discount

- 3.2.1 The proposals would introduce a 100 per cent discount for the category of lowest CO₂ emitting cars – those certified as emitting 120g/km of CO₂ or less (VED bands A and B) that also meet the Euro 4 standard for air quality emissions. As stated above, TfL would consider that any car registered on or after 1 January 2005 met the Euro 4 air quality standard. Therefore any car in VED band A or B registered after this date would qualify for the low CO₂ discount. The air quality element to the low CO₂ discount has been included to encourage drivers to also use cars with lower levels of those emissions that degrade air quality.
- 3.2.2 It is proposed that the low CO₂ discount scheme would be operational from 4 February 2008.
- 3.2.3 Currently, about one per cent of all cars in the congestion charging zone would qualify for the low CO₂ discount. These include smaller models of conventional cars such as the Citroen C1 1.4HDi petrol (109g/km), the Peugeot 206 1.4HDi diesel (112g/km) and the Smart Fortwo (116g/km) and hybrid cars such as the Toyota Prius, which has CO₂ emissions of 104g/km.
- 3.2.4 Cars eligible for the low CO₂ discount would have to be registered with TfL and a £10 yearly administration fee would have to be paid to receive the discount. TfL would send out a reminder letter 30 days prior to the discount expiry date and invite the account holder to extend the discount for a further 12 months.

3.3 Higher charge (£25) for highest CO₂ emitting cars and extended-cab dual purpose pickups

Higher charge for cars

- 3.3.1 Drivers of the highest CO₂ emitting cars – those registered as emitting 226g/km and above – would be required to pay a £25 daily charge to drive within the Congestion Charging zone.
- 3.3.2 Vehicles certified as emitting 226g/km of CO₂ and above were included in VED band F up until March 2006, when a new cap of 225g/km was applied to band F. Subsequently, new cars emitting 226g/km and above were included in the new band G. Almost three quarters of the cars potentially liable for the higher charge seen in the Congestion Charging zone were registered between March 2001 and March 2006. The emissions related congestion charging proposals are therefore based on the CO₂ emissions of a car as recorded with the DVLA and stated on the car's vehicle registration certificate, rather than the VED band.

- 3.3.3 It is also important to encourage a shift away from older cars which have high levels of CO₂ emissions. Older cars tend to have worse air quality emissions than newer cars. Therefore it is proposed that the higher charge would also apply to the largest cars registered before 2001. For these cars, engine size would be used as a proxy for CO₂ emissions and the higher charge would apply to cars registered before March 2001 with recorded engine capacities of over 3,000cc. TfL considers that 3,000cc is a generous approximation of cars in VED band G or equivalent, thereby minimising any potential social impacts on the owners of older cars, who tend to have lower incomes than owners of newer cars.
- 3.3.4 The Society of Motor Manufacturers and Traders defines executive cars as cars with engines over 2,800cc. Therefore, setting the limit for the higher charge at 3,001cc means that the higher charge would apply to luxury models rather than standard family models which would minimise potential social impacts of the proposals on families.
- 3.3.5 For example, types of cars with engines over 3,000cc include the Porsche Carrera (3,189cc) and the BMW X5 (4,799cc). The Ford Mondeo LX (1,798cc) is less than 3,000cc and would be subject to the standard £8 daily charge.
- 3.3.6 The higher charge would become operational on 6 October 2008. From 7 July 2008, drivers subject to the higher charge who paid the charge in advance would pay the standard charge (£8) for the period up until the higher charge commenced and £25 for any days after the higher charge commenced.
- 3.3.7 Around 14 per cent of all cars in the Congestion Charging zone would be liable for the higher charge, not including those who would qualify for discounts from the scheme.

Figure 3.2: Summary of intended level of charge by emissions

100 per cent low CO ₂ discount	£8 standard Congestion Charge	£25 higher charge
<ul style="list-style-type: none"> 120g/km CO₂ or less (VED bands A & B) and meet Euro 4 emission standard 	<ul style="list-style-type: none"> 120g/km CO₂ or less and do not meet Euro 4 emission standard 121 to 225g/km CO₂ (VED bands C- F*) Pre-2001 registered with engine capacity up to and including 3,000cc 	<ul style="list-style-type: none"> 226g/km CO₂ and above (VED band G equivalent*) Pre-2001 registered with engine capacity over 3,000cc

* Band G means band G and equivalents ie cars registered on or after 1 March 2001 with certified CO₂ emissions of 226g/km and above. Cars in VED band F registered between 1 March 2001 and 22 March 2006 with certified CO₂ emissions between 121 and 225g/km would be subject to the standard charge and those with certified emissions of 226g/km and above would be subject to the higher charge (band G equivalent).

Higher charge for extended-cab dual purpose pickups

- 3.3.8 A £25 daily charge would also apply to extended-cab dual purpose pickups to drive within the Congestion Charging zone. While these vehicles are classified by the DVLA as light goods vehicles rather than passenger cars, they have been constructed in such a way that they are equally suited to carrying both passengers and goods.
- 3.3.9 These vehicles are often used for private as opposed to commercial use, have two rows of seats capable of carrying at least four passengers and are similar in size and appearance to many sport utility vehicles already on the market. Most of these vehicles have carbon emissions equivalent to band G or equivalent cars. However, as light goods vehicles they are not charged variable road tax on the basis of CO₂ emissions and pay a much lower rate of road tax than SUVs with equivalent CO₂ emissions.
- 3.3.10 A market already exists for luxury extended-cab dual purpose pickups. Such vehicles receive a reduced rate of benefit-in-kind taxation as commercial vehicles if purchased through a company, as opposed to the equivalent purchase of a car. In the USA, pickups were excluded from the corporate average fuel consumption mandate which was introduced to reduce CO₂ emissions. Manufacturers consequently produced a luxury range of powerful vehicles that were then purchased in large numbers for private use. If these vehicles were to be subject to the standard charge rather than the higher charge they could become a more attractive option, particularly if they also received the benefit of the residents' discount.
- 3.3.11 Given that extended-cab pickups are similar in build to many of the highest CO₂ emitting sport utility vehicles, it is proposed that, where the CO₂ emissions are 226g/km and above, the vehicle should be subject to the £25 daily charge. This would prevent creating a perverse incentive to purchase high CO₂ emitting vehicles which would otherwise avoid the higher charge.
- 3.3.12 Until July 2009, the emissions proposals would only apply to extended-cab dual purpose pickups registered after 4 February 2008. This is in order not to disadvantage commercial operators who purchased one of these vehicles primarily for business before these proposals were known. Extended-cab dual purpose pickups registered prior to 4 February 2008 would be subject to the standard £8 charge until July 2009. From July 2009, all extended-cab dual purpose pickups with CO₂ emissions of 226g/km and above would be subject to the £25 higher charge. However, as information on the CO₂ levels of these vehicles registered before 2008 is unlikely to be available, an engine size of 3,001cc would be used as a proxy for any extended-cab dual purpose pickups registered before February 2008 and those registered after February 2008 for which CO₂ emissions data is not available.

3.3.13 The DVLA classifies extended-cab dual purpose pickups as light goods vehicles. Diesel-engined extended-cab dual purpose pickups would also fall within the scope of the Greater London Low Emission Zone. The Low Emission Zone would require the most polluting diesel-engined vehicles to meet specific air quality emission standards or pay a substantial daily charge to drive within the zone. The emission standard for light goods vehicles is Euro 3, which extended-cab dual purpose pickups registered as new on after 1 January 2002 would meet. From October 2010, drivers of diesel-engined extended-cab dual purpose pickups which did not meet the Euro 3 standard which would be liable for both the Low Emission Zone and the higher £25 daily charge would be able to register with TfL to pay the standard £8 Congestion Charge (rather than the higher charge) in addition to the Low Emission Zone daily charge. More information on the Low Emission Zone is provided in section 3.8.

Interaction with pay next day scheme

3.3.14 Drivers of cars and extended-cab dual purpose pickups subject to the higher charge would be able to pay the £25 daily charge before or on the day of travel. Drivers would also be able to pay the next charging day after travelling in the Congestion Charging zone but would be subject to a £27 charge. This is consistent with the pay next day function for the standard charge, which levies an additional £2 to the daily charge when the charge is paid the next day.

3.4 Standard charge (£8)

3.4.1 The majority of cars within the Congestion Charging zone would not be directly affected by the proposals. Under the proposals, around 85 per cent of the cars currently using the Congestion Charging zone would continue to be subject to the standard charge.

3.4.2 The standard charge would be payable by cars certified as emitting between 121g/km and 225g/km of CO₂. This would include:

- all cars in VED bands C to E
- all cars in VED band F registered on or after 23 March 2006
- cars in VED band F registered between 1 March 2001 and 22 March 2006 with CO₂ emissions up to 225g/km.

3.4.3 Cars registered before 1 March 2001 with a recorded engine capacity of up to and including 3,000cc would also be subject to the standard charge.

3.4.4 In addition, it is proposed that cars certified as emitting 120g/km of CO₂ or less that did not meet the Euro 4 air quality standard would be subject to the standard charge. This would include most cars in VED bands A and B registered before 1 January 2005.

3.5 Discontinuation of the alternative fuel discount

- 3.5.1 The current alternative fuel discount is a 100 per cent discount to the Congestion Charge for certain vehicles that are powered by an alternative fuel and not solely by petrol or diesel and that meet strict emissions criteria. To be eligible a vehicle will either have been manufactured, or converted, to run on an alternative fuel and the vehicle type and/or conversion supplier must be listed in the appropriate band on the Transport Energy Powershift Register or listed as meeting an equivalent standard on the Transport Energy Clean Up Register.
- 3.5.2 The low CO₂ discount focuses on actual exhaust emissions rather than the type of technology used. Of cars registered for the alternative fuel discount seen in the congestion charging zone, around one quarter have CO₂ emissions of 186g/km and above (VED bands F and G). TfL does not consider that it is appropriate that cars emitting high levels of CO₂ should receive a 100 per cent discount from the Congestion Charge.
- 3.5.3 TfL proposes that the alternative fuel discount would be closed to new registrations from 4 February 2008 when the low CO₂ discount would commence. Those vehicles already registered for the alternative fuel discount would continue to receive their discount until July 2009, or when vehicle ownership changes, if this is earlier.
- 3.5.4 It is proposed that cars registered for the alternative fuel discount which also qualified for the low CO₂ discount would be automatically transferred to the low CO₂ discount for the first year following implementation of the scheme. In subsequent years, they would need to be registered with TfL, and a £10 yearly administration fee paid, to receive the discount. Around a quarter of cars registered for the alternative fuel discount would qualify for the low CO₂ discount. Should the proposals be introduced, TfL would write to those drivers affected, prior to the implementation of the low CO₂ discount, to advise that their car had been included on the register of cars that qualify for the low CO₂ discount.
- 3.5.5 Following the proposed end of the alternative fuel discount in July 2009, it is intended that cars which emit 226g/km of CO₂ and above and cars registered before March 2001 with engine capacities over 3,000cc (around four per cent of alternative fuel discount cars) would be liable for the £25 higher charge. It is proposed that vans and lorries would be subject to the standard £8 daily Congestion Charge (unless they meet the Euro V air quality standard – see section 3.8). The standard charge would also apply to cars with CO₂ emissions of 120g/km or less that did not meet the Euro 4 air quality standard, cars between 121 and 225g/km and those registered before March 2001 with engine capacity up to and including 3,000cc.

3.6 Interaction with other Congestion Charging discounts and exemptions

Residents' discount

- 3.6.1 It is proposed that residents who are currently eligible for the 90 per cent residents' discount and who drive a high CO₂ emitting car (226g/km and above or registered pre-2001 with an engine size over 3,000cc) would no longer be eligible for the 90 per cent discount. Around one quarter of residents' discount cars in the Congestion Charging zone would potentially be liable for the higher charge.
- 3.6.2 Residents with cars that qualified for the 100 per cent low CO₂ discount (currently 0.1 per cent of residents' discount holders) would be automatically registered for this discount. Should the proposals be introduced, TfL would contact those drivers affected, prior to the implementation of the low CO₂ discount, to advise that their car had been included on the register of cars that qualify for the low CO₂ discount. Any remaining monthly or annual charges paid prior to 4 February 2008 (when it is proposed the low CO₂ discount would be implemented) would be automatically refunded to the residents' discount holder in the form of a cheque.
- 3.6.3 It is proposed that, for residents' cars subject to the higher £25 charge, any monthly or annual charges purchased before 7 July 2008 at the residents' discounted rate would be honoured. Any monthly or annual charge for a car subject to the higher charge purchased on or after 7 July 2008 would be charged on a pro-rata basis, that is at the residents' discounted rate until 6 October 2008 (when the higher charge would be implemented), with the remainder charged at the higher £25 rate.
- 3.6.4 A considerable proportion of households within the Congestion Charging zone do not own a car (55 per cent) compared with inner London (51 per cent) and outer London (29 per cent).
- 3.6.5 The 90 per cent residents' discount recognises that residents in the zone, whilst benefiting from good public transport, may have less choice about driving in the zone and paying the Congestion Charge. However, residents have just as much choice as anyone who lives outside the zone in the *type* of car they purchase. It is therefore proposed that the higher £25 charge should apply to residents who choose to drive a band G or equivalent car.
- 3.6.6 A higher proportion of residents who qualify for the 90 per cent discount currently have band G and equivalent cars compared to London as a whole and it is important that they are encouraged to switch to lower emitting cars. While the higher charge represents a significant increase on the £4 weekly residents' discount charge, the 90 per cent discount would still apply to the majority of residents. In addition, many of the band G and equivalent cars have models in band F and there is a range of cars available across different bands. Residents potentially affected by the higher charge could therefore choose to change their vehicle and continue to take advantage of the 90 per cent discount. Residents could also take advantage of the 100 per cent low CO₂ discount for cars in bands A and B which also meet the Euro 4 air quality standard.

Blue badge holders

- 3.6.7 Blue badge holders would not be affected by the proposals. Blue badge holders would be able to continue to register for a 100 per cent discount from the Congestion Charge, regardless of the CO₂ emissions of their car or their nominated vehicle.
- 3.6.8 While TfL would aim to incentivise all drivers to switch to lower emitting vehicles, TfL recognises that blue badge holders often do not have the same level of choice regarding the vehicle they either drive themselves or are driven in. Blue badge holders may need a larger car or a specific type of car depending on the nature of the disability. Furthermore, blue badge holders may have adapted their vehicles to meet their needs and could experience higher compliance costs than other drivers.
- 3.6.9 Passenger carrying vehicles for people with disabilities, and vehicles used by people with disabilities that are exempt from VED would continue to be automatically exempt from the Congestion Charge and would not need to be registered with TfL.

100 per cent reimbursement (of the standard charge)

- 3.6.10 A 100 per cent reimbursement of the Congestion Charge applies for certain journeys undertaken by firefighters, NHS staff and certain NHS patients. This applies to private vehicles used by firefighters for operational journeys between fire stations and vehicles used by NHS staff on certain operational journeys when carrying bulky, heavy or fragile equipment, confidential patient notes or controlled drugs, or responding to emergencies when on call. Firefighters and NHS staff are required to pay the charge and then claim it back from their employer, who is then reimbursed by TfL.
- 3.6.11 Vehicles used by certain patients attending NHS appointments in the charging zone may also be eligible for a 100 per cent reimbursement of the Congestion Charge. To be eligible, patients must have a compromised immune system, require regular therapy or assessment, or require recurrent surgery and be clinically assessed as too ill, weak or disabled to travel to an appointment on public transport. Eligible patients are required to pay the charge and then claim it back from the relevant NHS body. TfL reimburses the charges incurred to these organisations.
- 3.6.12 Under the proposals, following the implementation of the higher charge in October 2008 TfL would cap the reimbursement it pays to NHS bodies and London Fire Authorities at £8, including for drivers of cars subject to the £25 daily charge. TfL considers that, in principle, all cars with CO₂ emissions of 226g/km and above should be subject to the higher charge unless there are specific operational requirements the vehicle must meet or in the small number of cases where choice of vehicle may be limited, such as with blue badge holders.

Borough operational vehicles and selected partners

- 3.6.13 Operational vehicles used by London boroughs and selected partners, such as the Metropolitan Police Service, London Fire and Emergency Planning Authority and the military, are currently exempted from the Congestion Charge.
- 3.6.14 It is proposed that the exemption for borough operational vehicles would not apply to any cars with CO₂ emissions of 226g/km and above or pre-2001 registered cars with engines over 3,000cc from the implementation of the higher charge (October 2008).
- 3.6.15 The exemption for selected partners' vehicles would not apply to cars with CO₂ emissions of 226g/km and above, unless an operational requirement related to the required performance of the vehicle could be shown. This would be assessed against criteria specified by TfL.

Taxis and minicabs

- 3.6.16 As with other public transport vehicles, London licensed taxis (black cabs) and private hire vehicles (minicabs) would continue to be exempt from the Congestion Charge under the proposals. However, in line with other modes of public transport, TfL is investigating other ways of reducing CO₂ emissions from these vehicles.
- 3.6.17 Reducing CO₂ emissions from black cabs is more problematic because of the nature of these vehicles. Taxis have special requirements, including their turning circle, and wheelchair accessibility, which mean that they are larger vehicles and the options for change are more limited. Given their larger size and weight, the vast majority of taxis have CO₂ emissions of 226g/km and above. Given their prevalence in central London, they are a significant source of road transport CO₂ emissions. However, TfL is working with black cab manufacturers to investigate means of reducing their CO₂ emissions.
- 3.6.18 TfL is also working with the taxi and private hire industry to help reduce fuel use. Fuel consumption can be reduced by more than 10 per cent through eco-driving practices. This would contribute to reduced CO₂ emissions from vehicles and could also save the average black cab more than £400 a year in fuel costs.

Fleet vehicles

- 3.6.19 Fleet operators can pay the Congestion Charge the same way as other drivers. However, to reduce the level of administration and increase flexibility for fleet operators, an automated fleet scheme is available whereby the fleet operator can register vehicles in advance. To be eligible, a fleet operator must register a minimum of 10 vehicles.

- 3.6.20 It is proposed that the £25 higher charge would apply to any fleet vehicles with CO₂ emissions of 226g/km and above or registered before March 2001 with engine capacity over 3,000cc. Around 13 per cent of vehicles registered for TfL's fleet scheme could potentially be subject to the higher charge. For administrative purposes they could still be registered on the fleet scheme following implementation of the higher charge but these vehicles would be excluded from the £1 fleet scheme reduction.
- 3.6.21 A key aim of the proposals is to influence vehicle purchasing behaviour away from high CO₂ emitting cars. Cars owned by companies tend to be newer than privately owned cars and enter the second-hand market at a faster rate. In 2006, almost half of new cars registered in London were purchased by companies rather than private individuals. While company cars are more likely to be in the mid-range for CO₂ emissions (VED bands D and E) than privately owned cars, the proportions of cars with higher CO₂ emissions are similar for cars on the fleet scheme in the Congestion Charging zone compared with all cars in the zone (26 per cent in VED bands F and G). TfL does not consider it is appropriate to exempt fleet vehicles from the higher charge or to provide any additional discount for high CO₂ emitting cars.

Electrically propelled vehicles

- 3.6.22 Under the proposals, drivers of electrically propelled vehicles would remain eligible to register for a 100 per cent discount from the Congestion Charge.

Vehicles with nine or more seats

- 3.6.23 Vehicles with nine or more seats would be outside the scope of these proposals as TfL considers that such vehicles fall into a separate category of vehicle (known as large passenger vehicles), rather than cars. Such vehicles fall within the scope of the Greater London Low Emission Zone and will be required to meet certain air quality emissions criteria in order to drive within Greater London without having to pay a substantial daily charge.

3.7 Monthly and annual charges

- 3.7.1 Drivers who use the Congestion Charging zone on a regular basis can purchase a monthly or annual charge and receive a reduction on the total charge amounting to three free days in a month or 40 free days in a year. It is proposed that drivers of cars subject to the £25 higher charge who purchased a monthly or annual charge at the £25 daily rate would continue to receive a reduction on the total charge amounting to three free days in a month or 40 free days in a year. TfL acknowledges that even regular drivers do not tend to use the congestion charging zone on every charging day.

- 3.7.2 It is proposed that, for cars subject to the higher £25 charge, any monthly or annual charges purchased before 7 July 2008 at the current £8 daily rate would be honoured. Any monthly or annual charge for a car liable for the higher charge purchased on or after 7 July 2008 would be charged at the £8 daily rate until 6 October 2008 (when the higher charge would be implemented), with the remainder charged at £25 per day.

3.8 Euro V heavy vehicle discount

- 3.8.1 In addition to the emissions related congestion charging proposals, a small time-limited discount from the standard charge is proposed for the cleanest heavy vehicles, in order to complement the Greater London Low Emission Zone. The Low Emission Zone targets the most polluting vehicles, while the Euro V heavy vehicle discount would seek to encourage best practice by providing an incentive to operators to purchase the cleanest vehicles in terms of air quality.

- 3.8.2 The Low Emission Zone is focused on those vehicle emissions that affect air quality, rather than on CO₂. It will cover all of Greater London and will require the most polluting diesel-engined vehicles to meet specific emission standards or pay a substantial daily charge to drive within the zone. The zone will commence on 4 February 2008 and will initially apply to diesel-engined lorries over 12 tonnes. From July 2008 the zone will apply to all lorries over 3.5 tonnes, buses and coaches and from October 2010 the zone will apply to large diesel-engined vans and minibuses.



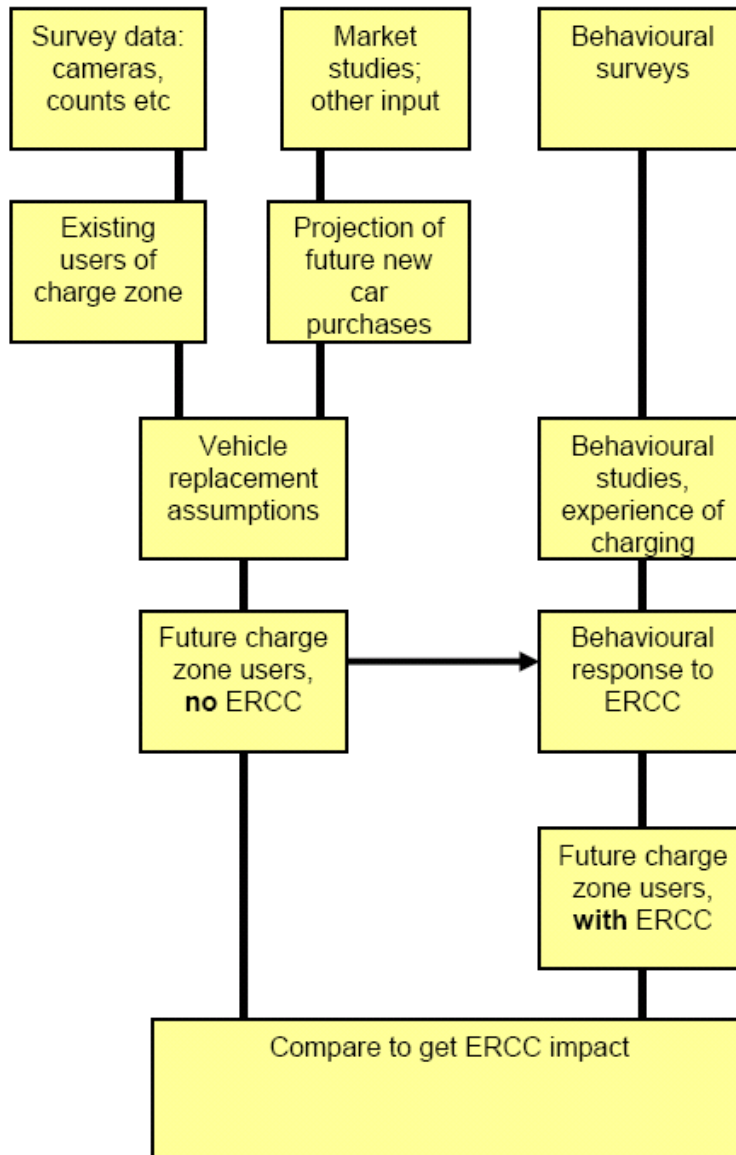
- 3.8.3 The aim of the Low Emission Zone is to improve air quality in London and thereby improve the health and quality of life of Londoners. Whilst the Low Emission Zone will discourage the use of the most polluting diesel-engined vehicles by charging them, the proposed discount from the congestion charge would help encourage operators to upgrade to the newest, cleanest models of diesel-engined vehicles.
- 3.8.4 European Commission approved standards ('Euro' standards) require progressive reductions in the exhaust emissions of newly manufactured vehicles of four regulated pollutants: carbon monoxide, hydrocarbons, oxides of nitrogen and particulate matter. These reductions become mandatory on specific dates. The highest current standard, Euro V, becomes mandatory for all new lorries sold in the EU from October 2009 and for all new vans sold in the European Union from January 2012. The main impact of the Euro V discount for lorries would be to reduce emissions of oxides of nitrogen, though there would also be sizable reductions in emissions of particulates for heavier vans. Roman numerals are commonly used to refer to Euro standards for heavy-duty diesel-engined vehicles (ie lorries, buses, heavier vans) and Arabic numerals for light-duty vehicles, such as cars and light commercial vehicles.

- 3.8.5 From October 2008, operators who could prove that their lorries or heavier vans were Euro V vehicles would be able to register for a discount from the Congestion Charge, so that they would pay only £6 instead of the standard £8 daily charge (or the £7 fleet scheme charge). The discount would apply until the date that all vehicles must be produced to the Euro V standard. For lorries, the discount would last until October 2009, and for heavier vans, until January 2012.
- 3.8.6 Operators would be able to produce two types of evidence to demonstrate that their vehicle met the Euro V standard and should be eligible for the discount. One is a Reduced Pollution Certificate, issued by the Vehicle and Operator Services Agency (VOSA) to early adopters of Euro V. The other is the Type Approval Certificate. TfL would check the engine make and model list on the Type Approval Certificate against a list of Euro V engines.
- 3.8.7 Only vehicles within the scope of the Low Emission Zone would be eligible for the discount. However, any extended-cab dual purpose pickups that were liable for the higher £25 charge on the basis of their CO₂ emissions would not be able to claim the Euro V heavy vehicle discount. Drivers of pickups which are used as passenger vehicles would be encouraged to purchase cars which emit less CO₂, whilst commercial users of pickups would have an alternative in the form of small vans. Drivers of extended-cab dual purpose pickups which would be liable for both the Low Emission Zone daily charge and the higher charge within the Congestion Charging zone would be able to register with TfL to pay the £8 standard charge rather than the higher £25 charge, in addition to the Low Emission Zone daily charge.
- 3.8.8 In the UK, uptake of newer vehicles in advance of the Euro standard becoming mandatory has tended to be quite low. Only around 1,300 Euro III lorries were manufactured in advance of the mandatory standard. However, there is considerable availability of Euro V lorries on the continent already, and uptake is likely to be greater than it has in the past. For example, in Germany, road toll discounts were introduced in 2005 which encouraged the early launch of Euro V lorries. Euro V vans are likely to become available very soon after confirmation of the technical requirements, expected by June 2008.

4 Impacts of the proposals

- 4.0.1 If the proposals are introduced, the emissions related charges will be reviewed by 2010. This supplementary information therefore considers the projected impacts of the proposals following their introduction and ahead of the review. The projected impacts take account of the phased introduction of the main proposals between February and October 2008.
- 4.0.2 It is important to note that these proposals are innovative and would introduce certain new elements to congestion charging. There are also background changes, for example in terms of the pattern of new cars being purchased. Consequently, there is some uncertainty in terms of driver responses and the precise effects of the proposals. It is therefore very important that TfL monitors this closely. The scheme will be reviewed in light of this information to ensure that the wider benefits of congestion charging are not compromised. If any unintended responses occur, TfL is able to readily propose modifications to the scheme.
- 4.0.3 In addition to the potential effects on vehicle use and traffic conditions – and hence on CO₂ and other vehicle emissions – the wider effects of the proposals on the environment, economy, society, health and sustainable development within the Congestion Charging zone and outside central London have also been considered.
- 4.0.4 In determining the impacts of the proposals, TfL used data from a number of sources to project the potential impact on the fleet of vehicles in the Congestion Charging zone and the emissions from these vehicles, with and without the proposals. These included behavioural surveys, monitoring studies, market impacts studies, other survey data and counts from TfL's automatic number plate recognition monitoring cameras. An outline of vehicles in London is provided in Appendix A.
- 4.0.5 The impact assessments presented here focus on the likely effects of the scheme ahead of the review. The proposals build on fiscal policies at the national level such as vehicle excise duty and complement policies at the local level, such as variable parking charges. They may also have wider impacts on policymakers both in the UK and internationally. London's leadership should help to provide an example for other cities and raise awareness more widely. The proposals could also inform the Government's deliberations in the context of the development of national road user charging. In this context, it is possible that the proposals could have wider impacts than those directly attributable at this stage.
- 4.0.6 Figures 4.1 and 4.2 overleaf show the relationships behind the analyses of the impacts.

Figure 4.1: Estimating the traffic and CO₂ effects of the emissions related congestion charging (ERCC) proposals

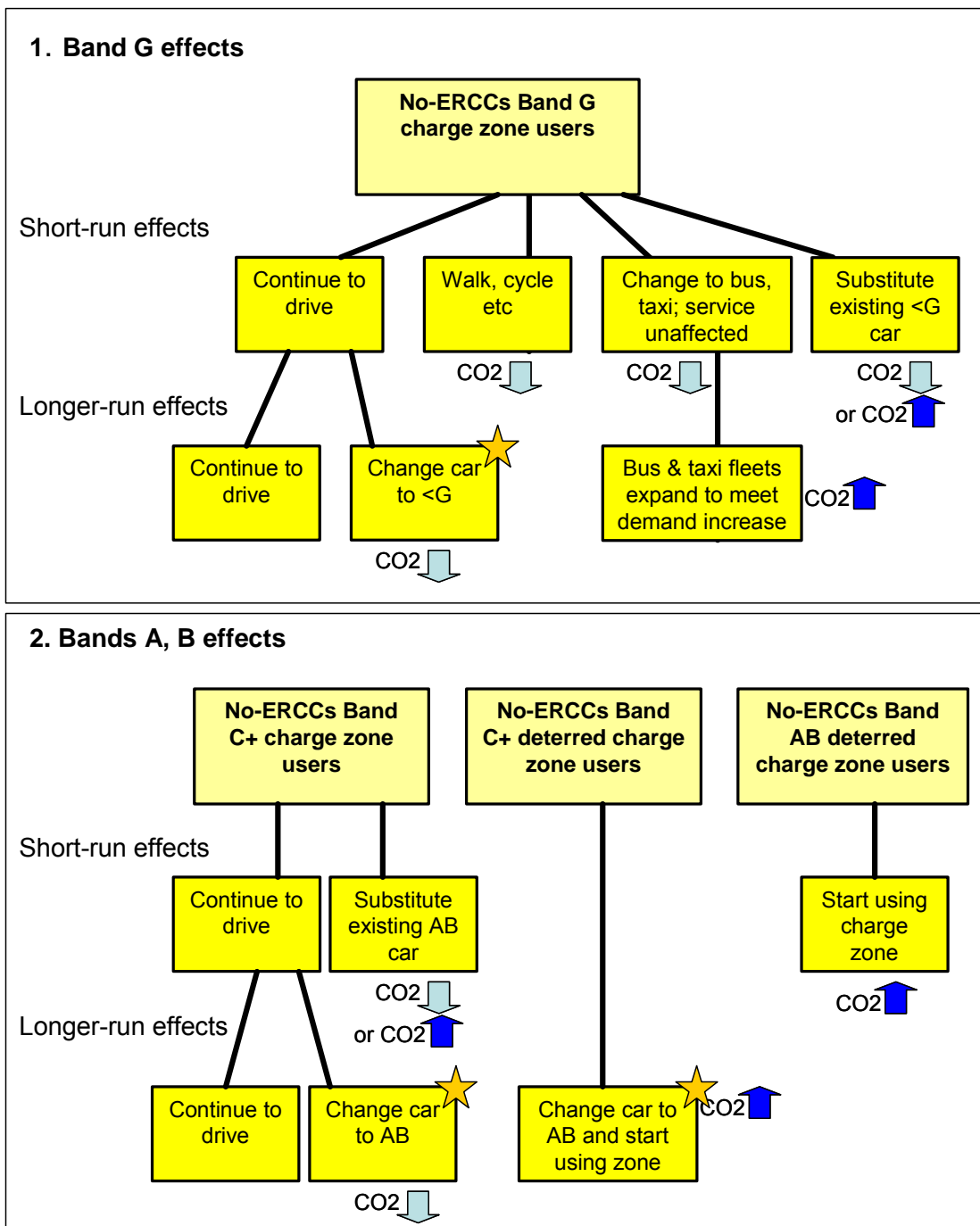


4.0.7 While TfL's analyses are informed by behavioural surveys and other studies, they include a number of informed judgements and interpretations of the evidence on driver behaviour.

4.0.8 In the short term, drivers of cars subject to the higher charge would either continue to drive, change to a different mode of transport, drive elsewhere or substitute the car with a car not subject to the higher charge. Those with access to cars eligible for the low CO₂ discount who were previously deterred from driving in the zone would consider making use of that car. A key issue is the relative strengths and scale of these responses.

4.0.9 Over time, a wider range of responses is possible. In particular, drivers may purchase a lower-banded car to replace their existing car. For band G drivers, it would be a case of avoiding the higher charge. For other drivers, the band A and B discount would encourage existing drivers using the charge zone to replace their existing higher-banded car, or could similarly encourage drivers currently deterred by the £8 charge from using the Congestion Charging zone.

Figure 4.2: Driver behaviour in response to the proposals



★ signifies response that will encourage change to lower-emission cars; full benefit depends on old car being scrapped and new car being an addition to the stock

- 4.0.10 Thus the proposals could encourage disposal of band G and equivalent cars and acquisition of band A or band B cars. The benefit of this change to the stock of vehicles will depend on the extent to which the stock is merely redistributed, with the old band G and equivalent cars being sold on to other users, or to which it is changed in total. For the full benefit of the proposals to be felt, the band G and equivalent cars disposed of would need to be scrapped and the band A or band B cars purchased would have to be additional and consequential to the proposals.
- 4.0.11 There would also potentially be some longer term effects on bus and taxi vehicle-kilometres, as bus and taxi fleets adapt to changes in demand.

4.1 Environmental impacts

- 4.1.1 Identifying the potential environmental impacts of the proposals involved an assessment of the impacts of the proposed scheme on the vehicle fleet in London and on traffic and congestion both inside and outside the Congestion Charging zone. This work allowed projections to be developed of the impacts of the scheme on CO₂ emissions, air quality and whole life impacts.
- 4.1.2 Overall, the direct effects of the proposals on car use in the short term are expected to have a small positive impact on CO₂ emissions. The short term impact on air quality is expected to be very small; and the effect on whole life impacts is expected to be minimal.

Impacts on the vehicle fleet

- 4.1.3 Based on results from a behavioural survey and research into market trends, TfL estimates that, if the proposals are implemented, there would be a gradual reduction in the number of cars subject to the higher charge entering the zone and a gradual increase in the number of cars eligible for the low CO₂ discount entering the zone. The various elements of the proposals would come into effect during 2008 and 2009; and some responses, such as the purchase of a different household car could take some time to take full effect. Therefore the impacts are likely to change over time. This document shows the estimated impacts of the proposals averaged across 2009 – since this is after implementation of the key elements of the proposals but prior to the review.
- 4.1.4 The effect of the low CO₂ discount may be relatively small in the short term because of the small number of vehicles immediately available and because of the relatively small financial change (from an £8 daily charge to £0) compared to that faced by users of cars subject to the higher charge (£8 daily charge to £25 daily charge).
- 4.1.5 Over time, the analyses suggest the effects on bands A and B cars would increase, as these vehicles grow in popularity and offer ‘free’ access to the Congestion Charging zone.

4.1.6 It needs to be borne in mind that the direct effect of the proposals would only be on cars entering the charging zone and liable to a charge. Cars liable for the full £8 charge are currently responsible for about 10-15 per cent of road vehicle CO₂ emissions within the zone during charging hours; cars eligible for the residents' discount are responsible for a further 5-10 per cent. The proposals apply directly to about one fifth of these cars. However, through their potential impact on congestion, the proposals also influence the overall emissions of CO₂ from all vehicles in and around central London.

Impacts on traffic and congestion

4.1.7 Figure 4.3 shows the projected impact of the proposals following implementation, and ahead of the review, in terms of circulating cars, circulating traffic and congestion inside the charging zone during hours of operation. Traffic and hence congestion is projected to slightly increase or slightly decrease, depending on the relative responses from low and high CO₂ emitting car drivers. A decrease in congestion would add to CO₂ reductions; an increase would detract.

Figure 4.3: Traffic and congestion: projected impacts inside charging zone

	Circulating cars	Circulating total vehicles	Congestion
2009	+0.9% to -0.5%	+0.4% to -0.3%	+0.8% to -0.6%

4.1.8 The range of responses reflects lower to higher sensitivity responses by drivers to the proposed changes. The lower sensitivity estimates are a combination of lower sensitivity to both the discount and the higher charge; conversely the higher sensitivity projections are a combination of higher driver sensitivities to both the discount and the higher charge.

4.1.9 Over time, due to the potential encouragement of bands A and B cars qualifying for the low CO₂ discount, there could be an increase in congestion. The scheme would therefore be monitored closely and, by 2010, reviewed to ensure that it does not increase congestion inside the zone.

Impacts on CO₂ emissions

4.1.10 CO₂ emissions under the proposals are calculated from the projected fleet profile using estimates of the distance travelled by vehicles of different types under different conditions and vehicle CO₂ emission rates. The CO₂ emissions are broken down into those produced within the Congestion Charging zone and those outside it. Projected savings in CO₂ arise when a car is either not used or is scrapped and replaced with a lower CO₂ emitting car or the lower volume of traffic reduces congestion and hence CO₂ emissions.

4.1.11 Figure 4.4 shows the projected impact of the proposals on road vehicle emissions of CO₂ during charging hours for the second year of the operation of the proposals. This indicates that the proposals would achieve a small overall reduction in CO₂ emissions. It is important to understand that the base used here is estimated CO₂ emissions from vehicles moving to, from and within the charging zone during charging hours (for 2007). Overall road transport emissions of CO₂ within London amount to about 8 million tonnes per year.

Figure 4.4: CO₂ emissions: projected impacts of the proposals

	Saving inside charging zone	Saving outside charging zone	Total saving	Per cent saving compared to base
	tonnes/year	tonnes/year	tonnes/year	
2009	400 to 2,500	800 to 5,700	1,200 to 8,200	0.3 to 2.0

Note: CO₂ emissions from cars using the Congestion Charging zone

4.1.12 The savings shown in Figure 4.4 result from changed travel by car drivers travelling to, from or within the charge zone. In due course significant further savings could result if the stock of cars changed in response to the proposals. There may be some additional savings outside charging hours from the reduced use of cars with higher levels of CO₂ emissions. However, this may be offset by the original vehicles being used elsewhere or by other owners within London.

Whole life cycle impacts

4.1.13 The whole life cycle of the fleet of vehicles using the Congestion Charging zone covers both the fuel life cycle and the vehicle life cycle. TfL’s research considers the impacts occurring during vehicle and fuel manufacture, use and disposal. Whole life cycle impacts take into consideration the impact on CO₂, resource use and the impact on waste. Around 80 per cent of CO₂ emissions result from vehicle use, while a smaller proportion result from vehicle and fuel manufacture.

4.1.14 TfL’s research suggests that the proposals would have a very limited impact on the emissions over the whole life cycle of a vehicle. With or without the implementation of the proposals, CO₂ emissions would be mainly released during vehicle operations. The small overall reduction in central London’s road transport CO₂ emissions in the short term would lead to small reductions in life cycle CO₂ emissions, as these would be dominated by reductions in emissions associated with the vehicle use phase of the life cycle.

4.1.15 The proposals should result in a small decrease in fuel consumption and would therefore have a small positive impact on fossil fuel depletion. The proposals would also result in a small decrease in the amount of raw material used to manufacture new vehicles, given the trend towards smaller lower CO₂ emitting cars, and would therefore have a slight positive impact on material resource use. The proposals could also result in small, short-term increases and negligible changes in the longer term in the amount of end-of-life vehicle waste generated and would therefore have a negligible impact on the amount of waste generated and disposed of in landfill sites.

Impacts on air quality emissions

4.1.16 TfL commissioned research on the impact of the proposals on emissions and concentrations of oxides of nitrogen (NO_x) and particulate matter (PM₁₀). NO_x is emitted from road vehicles mainly in the form of nitric oxide (NO), which then reacts with ozone to form nitrogen dioxide (NO₂). In areas where NO_x emissions are high, such as many parts of central London and close to busy roads, the reaction to form NO₂ may be limited by the availability of ozone in the atmosphere. However, a proportion of NO_x is also directly emitted as NO₂, known as primary NO₂, and is included in the dispersion modelling approach.

4.1.17 Recent evidence suggests that primary NO₂ emissions may be increasing because of changes in automotive engineering. This has important implications for predicting the influence of road transport emissions on air quality. This complicating factor is taken into account in determining the impact of the proposals on air quality.

4.1.18 Figures 4.5 and 4.6 show the results of this work. They indicate that in the short term there will be very little impact on emissions of NO_x and PM₁₀. The planned review will allow an assessment of whether the projected trend towards more fuel efficient but diesel-engined cars and the take up of band A and B cars might impact in the longer term on air quality.

Figure 4.5: Projected impacts of the proposals on NO_x emissions

	2007 base tonnes/ year	2009 base tonnes/ year	2009 with proposals tonnes/year	Per cent saving
Inside charging zone	1,450	1,300	1,300	≈0%
Outside charging zone	21,220	18,920	18,920	≈0%
London total	22,670	20,220	20,220	≈0%

Note: Central estimates

Figure 4.6: Projected impacts of the proposals on PM₁₀ emissions

	2007 base tonnes/year	2009 base tonnes/ year	2009 with proposals tonnes/year	Per cent saving
Inside charging zone	110	100	100	≈0%
Outside charging zone	1,620	1,530	1,530	≈0%
London total	1,730	1,630	1,630	≈0%

Note: Central estimates

4.2 Social impacts

- 4.2.1 In investigating potential social impacts of the proposals, TfL undertook an Equalities Impact Assessment focused on the Mayor’s equality target groups. These are Black Asian and Minority Ethnic people; young people and children; older people; disabled people; and people from different faith groups. The assessment also included people in socio-economic deprivation categories.
- 4.2.2 The assessment focused on the social inclusion, compliance and environmental inequality impacts of the proposals.
- 4.2.3 A separate Health Impact Assessment focused on the impacts associated with air quality and road safety.
- 4.2.4 The Equalities Impact Assessment and Health Impact Assessment are included in the Combined Impact Assessment of the proposals which is available on TfL’s website at www.tfl.gov.uk/CO2Charging.

Equalities impacts

- 4.2.5 The Equalities Impact Assessment concluded that the impacts of the proposals on current levels of social inclusion for people in the target groups would be relatively low.
- 4.2.6 While there could potentially be some negative impacts on large families where the family car was subject to the higher charge, there are many travel alternatives available for families and therefore the likely impact was considered to be low. Research shows that those families of Asian ethnicity are more likely to have relatively large families than those from other ethnic groups. It is therefore possible that these families could be more reliant on large band G and equivalent cars, or cars registered before 2001 which have engines over 3000cc, which would be liable for the higher charge.

- 4.2.7 As with other large families, if they were unwilling to pay the higher charge, the proposals could result in them experiencing reduced access to services or social networks within the Congestion Charging zone. However, it should be noted that public transport provision in central London is very good, and provides accessible alternatives for families. TfL provides free and discounted travel for children, teenagers and students on London buses, trams and the London Underground. Furthermore, there are a number of alternatives and equivalent vehicles in other bands, which would not be liable for the higher charge and would be cheaper to run in terms of fuel and other costs.
- 4.2.8 Research has shown that older vehicles (registered pre-2001) are more likely to be owned by people from households with a lower gross annual income and people who were not working full time. However, while households on a low income are more likely to own older cars, they are not necessarily negatively impacted by the higher charge.
- 4.2.9 Camera data indicates that only around three per cent of cars using the Congestion Charging zone are registered pre-2001 with engines over 3,000cc, while only around two per cent of cars registered in Greater London fall into this category. Only a relatively small proportion of these are likely to be owned by low income households.
- 4.2.10 The Department for Transport's National Travel Survey 2005 showed that, nationally, households earning below £12,500 own 11 per cent of pre-2001 cars that have an engine capacity of 3000cc or over. However this only represents 2.5 per cent of households nationally earning below £12,500. Households earning below £12,500 own five per cent of post-2001 cars that are in band G or have equivalent emissions, representing just four per cent of households earning below £12,500. The income distribution of Congestion Charging zone users is more weighted towards those households with a higher income than London households as a whole. Research indicates that lower income households are less likely to own a car and less likely to pay to drive in the Congestion Charging zone.
- 4.2.11 Low income households that do drive band G and equivalent cars, or large older cars, could experience increased costs from the proposals. Research suggests that low income households with a band G or equivalent car may be very unlikely to continue to drive into the zone, if the proposals were introduced. The wide range of public transport options in central London should help to mitigate impacts in terms of potentially reduced access. If low income households switched to a car in bands A to F or an older smaller car, they may experience short-term purchase costs to which they would be sensitive, but could then benefit from reduced running costs.
- 4.2.12 The Equalities Impact Assessment concluded that compliance impacts and environmental inequality impacts of the proposals would be low among individuals in the target groups. The introduction of the proposals could be beneficial for vulnerable road users (children and older people) and others in target groups, given the potential reduction in larger cars and increase in smaller cars.

Impacts on households and residents

- 4.2.13 Residents of the Congestion Charging zone who drive cars that would be liable for the higher charge would no longer be entitled to the residents' discount. While financial savings could be made by the use of cars in bands A to F in place of band G or equivalent vehicles from the lower costs of purchase, depreciation, insurance, fuel and residents' parking charges, there may well be some one-off costs associated with trading in a band G or equivalent vehicle. In addition, band G drivers may consider that there are other 'non-financial' costs associated with this, such as loss of comfort, security, or prestige. If there were not, then the simple question of high financial costs would have already caused band G drivers to trade in their vehicles for smaller ones.
- 4.2.14 The potential impacts on household expenditure can be gauged from analysis of current expenditure patterns. Over the period 2003/4 – 2005/6 households in London spent on average £62.10 per week on transport, equivalent to 12 per cent of overall household expenditure. Clearly an £85 increase in expenditure would therefore be very significant to the average London household – and this increase would be significantly higher for those previously receiving the residents' discount.
- 4.2.15 Households that use band G or equivalent vehicles are more likely to be in higher income groups; therefore the negative impact on household expenditure choices is likely to be substantially less acute. Since there is a wide range of public transport options in central London, and a wide range of cars which are not subject to the higher charge, it can be assumed that the impact of the higher charge on residents in the longer term is unlikely to be significant – or could be avoided.

Health impacts

- 4.2.16 The Health Impact Assessment concluded that the proposals would have a negligible impact on health. The assessment suggested that there could be some 'soft' effects in terms of feelings of well-being from people's perceptions that environmental issues are being tackled and that action is being undertaken to address problems.

4.3 Business impacts

- 4.3.1 TfL's research into the projected business impacts of the proposals included analysis of manufacturers and retailers of new and second-hand cars, other businesses, companies with car fleets and the public sector. This research concluded that the impact on London's economy would be low.

- 4.3.2 For the largest manufacturers, who generally have a wide range of models on the market and for whom sales within the London area are not a significant proportion of their European market, the impact from changes in demand resulting from the proposals would potentially be small. However, some niche manufacturers whose product offering concentrates on either band G or bands A and B cars may focus on the UK market. These manufacturers are likely to experience a change in sales within the London area. Even here, however, it is important to note that sales in London are a relatively small proportion of total European sales.
- 4.3.3 Local car retailers could be affected by changes in demand from users of the Congestion Charging zone. There would be more impact experienced by businesses within the Congestion Charging zone as customers may choose to avoid travelling inside the zone for purchasing or servicing a car. In particular, franchises for manufacturers of competing borderline VED band F and G vehicles could experience positive or negative effects, depending upon their banding. Value and sales of VED band F and band A and B cars would be likely to increase. There is unlikely to be a significant impact on repair and maintenance businesses, as they do not tend to be specific to individual models.
- 4.3.4 Businesses that operate alternative fuel vehicles in their fleets could experience some increased costs resulting from the withdrawal of the alternative fuel discount. Even if businesses had managed to recoup the costs of their initial investment, they would experience increased transport costs from July 2009, unless the vehicle qualified for the low CO₂ discount. The size of the additional costs and ability of businesses to absorb them would depend on the nature of the business and its operations.
- 4.3.5 TfL's research indicates that the proposals could have a small positive impact on companies with car fleets. It is estimated that only 10,000 to 16,000 cars a month that use the Congestion Charging zone are either leased or company owned band G or equivalent cars. Given the high turnover of many fleets, and the dynamic nature of the used-car market in the UK, the introduction of the higher charge would have a minimal impact on fleets. In addition, there is also the potential that fleets, including car club fleets, might actually save costs by running smaller, more fuel efficient cars. Leased and company cars in bands A and B would benefit from the low CO₂ discount, which could stimulate an increase of such cars as a proportion of fleets, e.g. in rental fleets.
- 4.3.6 London boroughs are unlikely to operate large numbers of cars that would be subject to the higher charge. Borough operational vehicles that are not subject to the higher charge are exempted from paying the Congestion Charge. Therefore, the potential impact of the proposals on London boroughs would be small. Some other public bodies operate cars that would be subject to the higher charge. Nevertheless the impact of the proposals on them is unlikely to be significant, given the small number of vehicles affected.

4.4 Evaluation of the impacts of the proposals

4.4.1 TfL has assessed the potential costs and revenues of the proposals and made an indicative evaluation of its impacts. Given the innovative nature of the proposals there is uncertainty around the following estimates; and so monitoring the impacts will be important.

Costs and revenues

4.4.2 The estimated costs of the proposals would be some £5 million of set-up costs and £1.5 million of publicity and public information costs. Additional monitoring costs to inform the review of the proposals would be some £0.5 million.

4.4.3 In the early years of operation, it is estimated that the proposals would involve additional operational and enforcement costs of some £1 to £2 million.

4.4.4 These costs reflect the additional features being introduced, their relative complexity, and the need for adequate public information and handling of enquiries and the commitment to a review of the effect of the proposals, were they implemented.

4.4.5 The proposals would affect the revenues from the charging scheme. The higher charge for band G and equivalent vehicles would generate additional revenues; this would be offset by a loss of revenue from those drivers who convert to, or currently use, cars eligible for the proposed 100 per cent discount. In 2009 charge revenues could increase by between £3 million and £36 million. The range represents uncertainties over driver responses.

4.4.6 The aim of these proposals is to encourage people to switch to lower emitting cars and not to raise extra revenue. The £25 higher charge is considered necessary in order to discourage people and companies from using high CO₂ emitting cars. It is estimated that revenues would reduce over time as more drivers switch from these cars.

4.4.7 Some chargepayers would incur changes in financial outgoings. There would be savings for chargepayers who qualify for the low CO₂ discount. Band G and equivalent drivers, or their employers or customers, would incur higher daily charges. The extra charge is a gain to TfL in the form of additional net revenues. The greater part of Congestion Charging net revenues has been spent to date in support of improvements to London's bus services.

Compliance costs

4.4.8 There would also be some changes in chargepayer compliance costs. This is the time and effort expended by chargepayers in complying with the scheme rather than the actual cost of the charge. There would be a range of impacts on individuals, households and businesses in terms of compliance but in aggregate the costs are expected to be broadly neutral over time, particularly after an initial period of adapting to the new charges.

- 4.4.9 For some band G drivers, the switch to another lower emitting household car would involve minimal effort, for others the purchase of another vehicle could involve significant effort. However, lower emitting (and smaller) cars would tend to be cheaper than a band G or equivalent car (or very large older car) and there would be ongoing savings, for example in terms of fuel and VED.
- 4.4.10 Band G drivers who continue using their vehicle would need to pay the £25 charge. There may be initial additional effort in terms of understanding the scheme but actual payment arrangements for the increased charge would be little different to the standard charge. However, for residents with band G or equivalent cars there could be additional costs as they may switch from a weekly or annual payment system to a daily payment (although there would still be the option of weekly, monthly or annual charge payments).
- 4.4.11 Drivers of band A and B cars would have to register for the discount, but there would then be compliance cost savings given that they will not have to pay a daily charge. There would be no additional compliance cost for drivers of cars receiving the alternative fuel discount or residents' discount holders that also qualify for the low CO₂ discount as these cars would be automatically registered for the discount. Drivers of vehicles registered for the alternative fuel discount that did not qualify for the low CO₂ discount would have a higher compliance cost involved with paying the charge.
- 4.4.12 For those band G drivers who switch to another mode, or who travel outside charging hours or to another destination, there is a loss – reflecting a change to a less preferred alternative – which is treated as broadly equivalent to half the difference between the original £8 charge and the proposed new £25 charge; with a somewhat higher figure for residents. For those who have previously been deterred from driving and who would now utilise a band A or B car there is a gain – reflecting a change to a preferred alternative – once again taken as broadly half the difference between the original charge and the new charge.
- 4.4.13 For those who already drive a band A or B vehicle there is also a financial gain from the 100 per cent discount; this translates into an equivalent financial loss to TfL.

Evaluation of impacts

- 4.4.14 As explained earlier, the proposals are innovative and therefore there is some uncertainty in the predicted impacts. Therefore only an indicative evaluation of the costs and impacts is possible.
- 4.4.15 The CO₂ impacts have been valued here at a social cost of £25 per tonne in 2007 prices and values, increasing in line with the UK Government central value.
- 4.4.16 Congestion impacts are valued by reference to the benefits of the current extended scheme, taken as £250 million per year. So a net one per cent reduction in congestion is taken as a loss of £2.5 million. This is a relatively simple approach, but given the marginal changes involved is considered fair and realistic.
- 4.4.17 Compliance costs are taken as negligible, once the scheme is operating. The value of the air quality impacts of the proposals is also taken as negligible.

- 4.4.25 It is important to note that the charge levels proposed are not related to the social cost of carbon. The higher charge is proposed at a level intended to effect behavioural change. A high level is believed to be necessary in order to be sure that individuals and companies would be genuinely incentivised to change their behaviour, given the relative ‘inelasticity’ of band G drivers to price.
- 4.4.26 Over time, the cumulative effect of increased numbers of lower CO₂ emitting cars as a result of the 100 per cent discount could be to increase traffic and congestion. It is clear that a degradation of congestion benefits would undermine the primary aim of the Congestion Charging scheme and could result in increases rather than decreases in CO₂ from traffic.
- 4.4.27 Given this, and the inherent uncertainties in predicting longer term impacts, it is vital that the review of the scheme by 2010 is informed by detailed monitoring of the performance of the scheme alongside any wider impacts on car purchasing behaviour. Congestion charging is a flexible tool that can be adapted in light of changing conditions in order to ensure that benefits are not being undermined.

4.5 Monitoring the impacts of the proposals

- 4.5.1 This section describes the main elements of TfL’s planned monitoring programme for the proposals. It takes into account recommendations from the research commissioned by TfL.
- 4.5.2 The monitoring programme would be managed by TfL and would build on monitoring activity already carried out. The programme would focus on changes within London but would also take into account impacts outside London. The programme has been divided into the following key work packages, which are outlined below:
- Traffic impacts
 - Environmental impacts
 - Social impacts
 - Business and economic impacts.

Monitoring traffic impacts

- 4.5.3 The proposals seek to discourage the use of the highest CO₂ emitting cars to, from and within the Congestion Charging zone thereby impacting on the nature of the vehicle stock using the zone. TfL would focus on measuring changes in cars coming into the zone, using data from the monitoring cameras within the zone.
- 4.5.4 These would include:
- The number of unique cars entering the Congestion Charging zone during charging hours by level of CO₂ emissions and fuel type; cars registered after 1

March 2001 would be classified by their level of CO₂ emissions and Euro air quality standard; while cars registered up to 1 March 2001 would be classified on the basis of their engine capacity to determine the type of charge for which they would be liable

- The number of unique cars entering the Congestion Charging zone outside charging hours by level of CO₂ emissions and fuel type
- The number of cars by level of CO₂ emissions and fuel type registered for the residents' discount and registered on the fleet scheme
- Studies of car purchasing behaviour.

4.5.5 Over time, the proposals would potentially affect congestion within the Congestion Charging zone. In addition to its continuing programme of congestion monitoring, TfL would seek to assess the change in vehicle kilometres travelled in the zone. This would show the relationship between any change in vehicle numbers within the zone and traffic flow.

4.5.6 Impacts of the proposals on traffic would be produced annually and would be reported in TfL's Annual Congestion Charging Impacts Monitoring Report. More frequent reporting would be considered as appropriate.

Monitoring environmental impacts

4.5.7 Changes in the stock of cars and traffic flows more generally within the Congestion Charging zone would impact on CO₂ and air quality emissions, both inside the zone and across London. However, as changes to total emissions from road transport cannot be measured directly, TfL would use the modelled changes to vehicle emissions as inputs into an emissions inventory. The key pollutants to be modelled are CO₂, particulates PM₁₀ and PM_{2.5} and NO₂, but impacts on other pollutants such as hydrocarbons, carbon monoxide and ozone would also be considered.

4.5.8 Any impact on changes in the numbers and types of cars by fuel type could have life cycle impacts. This takes into account the split in CO₂ emissions between vehicle and fuel manufacture and vehicle operation. Any increase in the proportion of hybrid cars, for example, would have an impact on life cycle emissions.

Monitoring social impacts

4.5.9 TfL would monitor any social and behavioural impact of the proposals, to include:

- travel behaviour change as a result of the higher charge, such as change of vehicle, mode, destination, or time of travel, or a reduction in travel
- social impacts including access to services; social behaviour and available time; the cost of living and financial hardship.

In particular, the monitoring of social and behavioural impacts would explore the impacts on those groups identified as potentially vulnerable, such as residents, large families and low income households.

Monitoring business and economic impacts

4.5.10 The following areas of work would be considered:

- characterisation of car fleet responses based on observed changes
- assessment of wider economic impact, including benefits using observed data
- an understanding of 'background' UK trends and developments in affected sectors and businesses to allow impacts to be understood in context
- consideration of likely costs and benefits across London
- prices, sales and registrations of new band A and B and F and G cars in London
- wider economic impacts on the car market including employment; profitability; and business churn
- understanding of the economic impact of the proposals outside London.

5 Indicative timetable and next steps

5.1 The consultation will run until **19 October 2007**. TfL will then prepare a report to the Mayor of London incorporating comments received during the consultation.

5.2 The Mayor will then decide whether or not to go ahead with the proposals and confirm the Variation Order, with or without modifications, and whether to proceed with introducing emissions related congestion charging. Once a decision has been made, TfL will publicise this decision, along with the reasons for the decision.

5.3 Should the Mayor decide to proceed with the proposals, the next steps in the process would be:

- **4 February 2008**

- Introduction of low CO₂ discount for cars certified as having CO₂ emissions of 120g/km or less and that meet the Euro 4 standard for air quality.
- Alternative fuel discount register closes for new registrations.

- **7 July 2008**

- Introduction of pro-rata charge payments (for the higher charge from 6 October 2007) for drivers paying annual and six monthly charges.

- **6 October 2008**

- Introduction of higher charge for cars with the highest levels of CO₂ emissions.
- Introduction of higher charge for extended-cab dual purpose pickups (registered with the DVLA after 4 February 2008) with the highest levels of CO₂ emissions.
- Introduction of Euro V heavy vehicle discount for lorries and heavier vans that meet the Euro V standard for air quality.

- **July 2009**

- Withdrawal of the alternative fuel discount for vehicles registered with TfL that do not qualify for the low CO₂ discount. Cars with the highest CO₂ emissions (certified as 226g/km and above or pre-2001 registered with engine over 3,000cc) would be subject to the higher charge.
- Extended-cab dual purpose pickups registered on or before 4 February 2008 with engine capacity over 3,000cc would become liable for the higher charge.

- **October 2009**

- Euro V air quality standard becomes mandatory for lorries. Euro V heavy vehicle discount closes for lorries only, continues for heavier vans.

- **January 2012**

- Euro V heavy vehicle discount closes as Euro V air quality standard becomes mandatory for heavier vans.

5.4 If the Mayor confirms the Variation Order and decides to proceed with the proposals, a public information campaign would take place to help ensure that drivers are aware of the changes to the way Congestion Charging operates.

Keeping the scheme under review

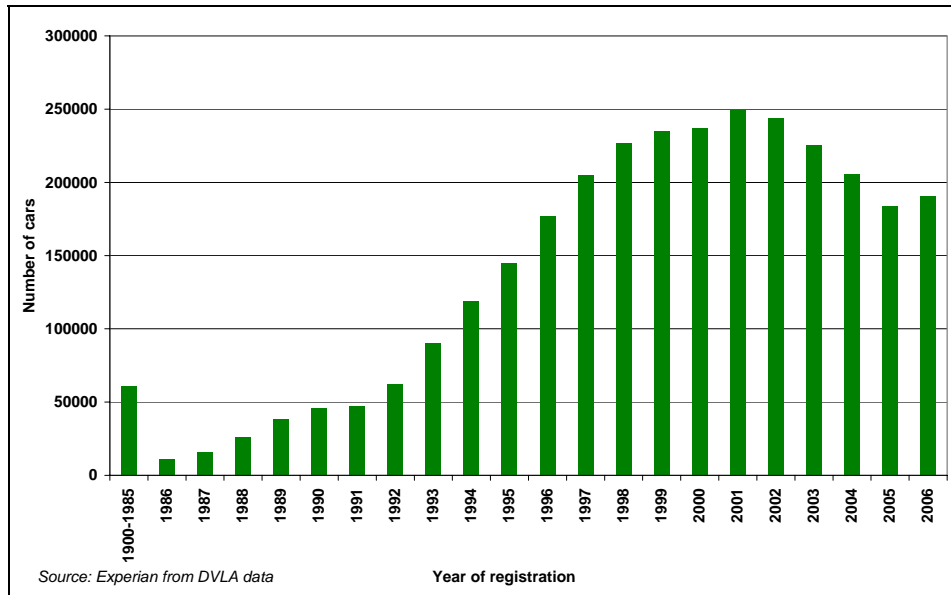
5.5 In the short term, the impacts of the proposals are projected to encourage switching from higher CO₂ emitting cars. However, growing numbers of low CO₂ cars and the cumulative effect of their eligibility for a 100 per cent discount could increase the overall number of cars entering the charging zone. Reducing congestion remains the primary objective of the Congestion Charging scheme. Moreover, a reduction in congestion would also result in a consequential reduction in CO₂ emissions.

5.6 TfL would therefore review the scheme by 2010. If monitoring showed that the primary aim of the scheme – in terms of reducing congestion – was being compromised, changes to the scheme would be brought forward. The review would consider both the discount and higher charge. Any proposed amendment to the scheme would be subject to full public and stakeholder consultation.

Appendix A: Vehicles in London

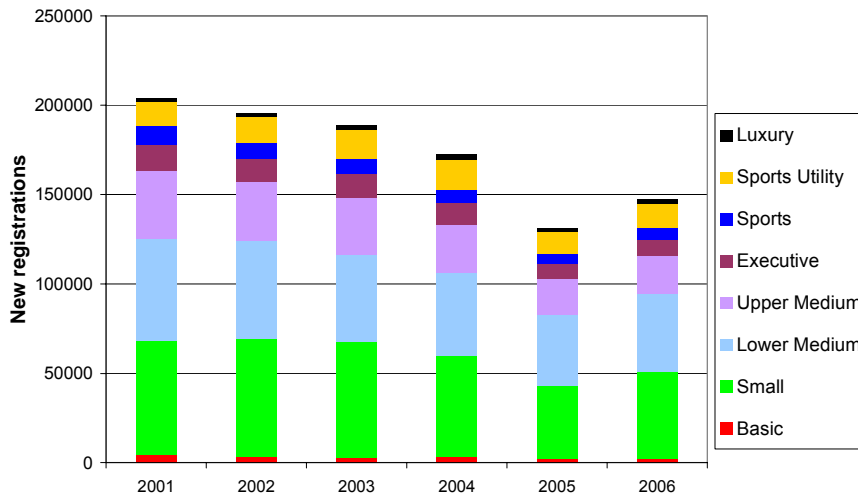
- A1. London has a large car market which to some extent influences the shape of the car market for the country as a whole. The Department for Transport's *Transport Statistics for 2006* indicate that there are around 2.9 million vehicles registered in Greater London, of which around 2.5 million are cars. This represents around 10 per cent of all cars registered in Great Britain. Around eight per cent of all new car registrations – including company registrations – in Great Britain are in London. The figures probably underestimate car registrations in London because of the effect of company car registrations.
- A2. Within London, the market for cars differs from that of Great Britain as a whole. The total number of vehicles in London increased from 2.6 million in 1995/6 to three million in 2005/06, an increase of 15 per cent, but half the rate of growth for Great Britain as a whole. More households in Greater London do not have a car (41 per cent) and this trend is increasing in comparison with Great Britain as a whole. The proportion of households with two or more cars (19 per cent) is also lower in London.
- A3. Research undertaken for TfL indicates that around 90 per cent of cars in London are privately owned, with the remaining 10 per cent owned by companies. Cars owned by companies tend to be newer than privately owned cars. Eighteen per cent of vehicles registered after March 2001 are owned by companies compared with only five per cent of vehicles registered before March 2001. For cars registered in London in 2006, the proportion owned by companies increases to 45 per cent.
- A4. Just under half of the cars (around 40 per cent) registered in London were registered after March 2001, after the introduction of VED emission bands. Figure A.1 overleaf shows that, of the around 60 per cent of vehicles registered in London before March 2001, there are considerably fewer that are 10 or more years old and few that are 20 or more years old (less than two per cent). Registrations data shows a peak in cars in London registered in 2001 when the VED emissions bands came into effect.

Figure A.1: Numbers of new cars registered in London by year of registration



- A5. The distribution of new car sales in London by CO₂ emissions has remained relatively stable during the last decade. New cars with CO₂ emissions of 226g/km and above (equivalent to VED band G) increased from five per cent of car sales in 1997 to almost seven per cent in 2003 but had fallen again by 2006 to 5.5 per cent. Sales of new cars with CO₂ emissions between 186-225g/km (equivalent to VED band F) decreased from 37 per cent in 1997 to 25 per cent in 2006 while sales of new cars with CO₂ emissions between 166-185g/km (VED band E) increased from 25 per cent in 1997 to 33 per cent in 2006. In 1997 there were no new car sales with emissions of 120g/km or less (VED band A and B) and this had increased only marginally by 2006 for VED band B cars.
- A6. For cars registered in London in 2006 by VED band, the largest share of cars owned by companies fell within VED bands D and E, at around half of all car registrations. The majority of band G or equivalent cars (around 70 per cent) and band B cars (around 60 per cent) were purchased by private owners rather than companies.
- A7. Figure A.2 below shows an analysis of market segments in London. This indicates that the 'basic' market segment, encompassing cars in bands B and C, has remained steady at around two per cent of new registrations. The 'small' market segment has the largest market share (around 30 per cent) and encompasses cars in bands C and D, although there is potential for new cars to move into lower bands with improved technology. Registrations in the 'upper medium' and 'executive' market segments declined between 2001 and 2006. Cars in these segments were previously more likely to be in band F but in recent years an increasing share are in band E. The growth in the market for 'sport utility' vehicles and 'luxury' cars has helped to sustain a market for cars that are in band G.

Figure A.2: New car registrations in London 2001-2006 by market segments



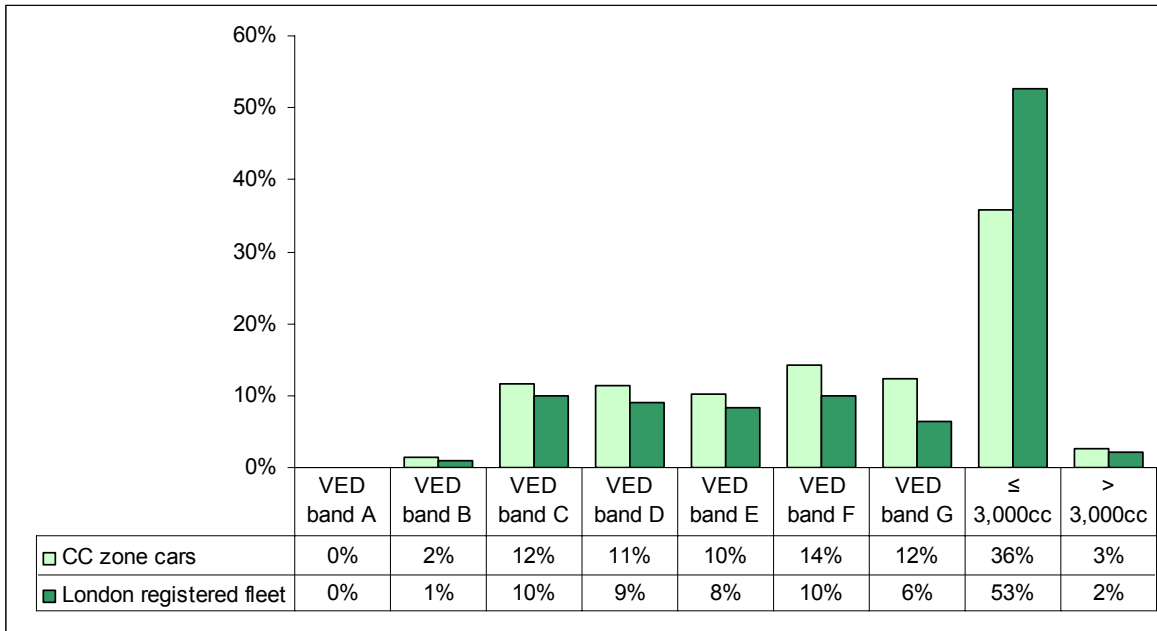
Note: the number of new car registrations in London declined from 200,000 in 2001 to 130,000 in 2005, but recovered slightly to around 150,000 in 2006, although this is still below the number of new registrations recorded prior to 2001.

Source: Experian from DVLA data and SMMT

Cars within the Congestion Charging zone

- A8. About 20% of cars in London make trips at least periodically within the extended central London Congestion Charging zone. Cars using the Congestion Charging zone tend to be newer than London's overall car fleet. Around one third of cars seen in the Congestion Charging zone are less than three years old compared with around 20 per cent of the cars registered in London while fewer than 10 per cent of cars seen in the Congestion Charging zone are more than 10 years old compared with around 30 per cent of cars registered in London.
- A9. Cars within the Congestion Charging zone also tend to have higher CO₂ emissions than the national fleet. As can be seen in Figure A.3 below, there is a higher proportion of cars in band G or equivalent in the zone (12 per cent) than in the London fleet (six per cent). This difference is even more pronounced when comparing cars in the national fleet and cars in the congestion charging zone purchased since March 2006. Sixteen per cent of cars registered since March 2006 in the congestion charging zone have CO₂ emissions of 226g/km and above compared with seven per cent nationally and 11 per cent of cars registered in London.

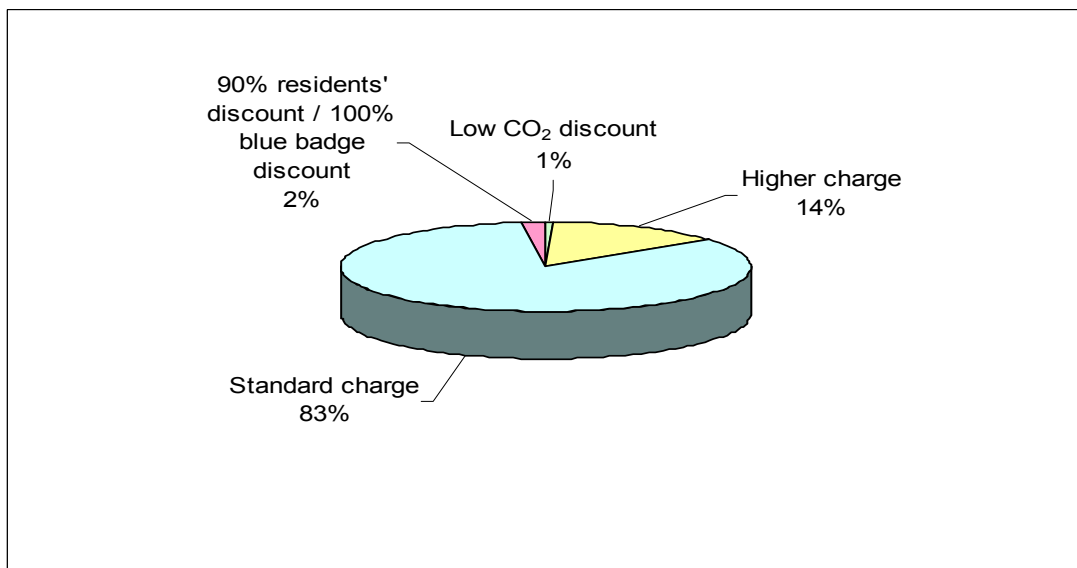
Figure A.3: Comparison of cars registered in London and cars in the Congestion Charging zone by VED band (post-March 2001 registrations) and engine capacity (pre-March 2001 registrations) and engine capacity (pre-March 2001 registrations)



Note: VED band G includes all cars registered on or after 1 March 2001 with CO₂ emissions of 226g/km and above.

A10. Of all cars within the Congestion Charging zone in June 2007, around 14 per cent would be subject to the higher charge – this figure does not include drivers who would not be liable to the charge, such as blue badge holders. Less than one per cent would currently qualify for the low CO₂ discount, by having CO₂ emissions of 120g/km or less and meeting the Euro 4 air quality standard. As can be seen in Figure A.4, the majority of cars (85 per cent) would continue to be subject to the standard charge or other discounts, such as the residents’ discount or blue badge holders’ discount.

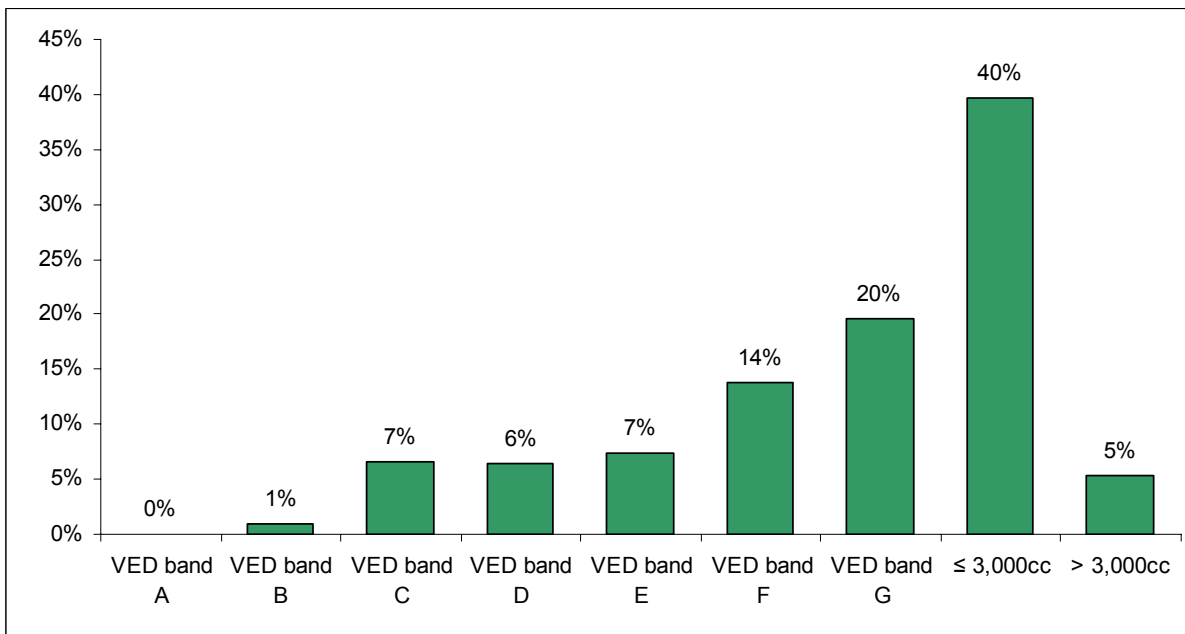
Figure A.4: Estimated proportion of cars in the Congestion Charging zone by charge payment (June 2007)



Congestion Charging zone residents' cars

A11. A higher proportion of cars registered for the residents' discount that use the Congestion Charging zone are band G and equivalent (20 per cent) compared with all cars in the zone (12 per cent) and cars registered nationally (five per cent) or in London (six per cent). The proportion of high CO₂ emitting cars is even larger with newer cars. Around a third of residents' discount cars registered new with DVLA after March 2006 have CO₂ emissions of 226g/km and above compared with new cars using the zone (16 per cent) and cars registered nationally (seven per cent) or in London (11 per cent). TfL considers it is appropriate to remove the residents' discount for higher CO₂ emitting cars in order to influence drivers to use lower CO₂ emitting cars. Of residents' discount cars seen in the zone, around one quarter would potentially be subject to the higher charge (excluding residents who are also blue badge holders).

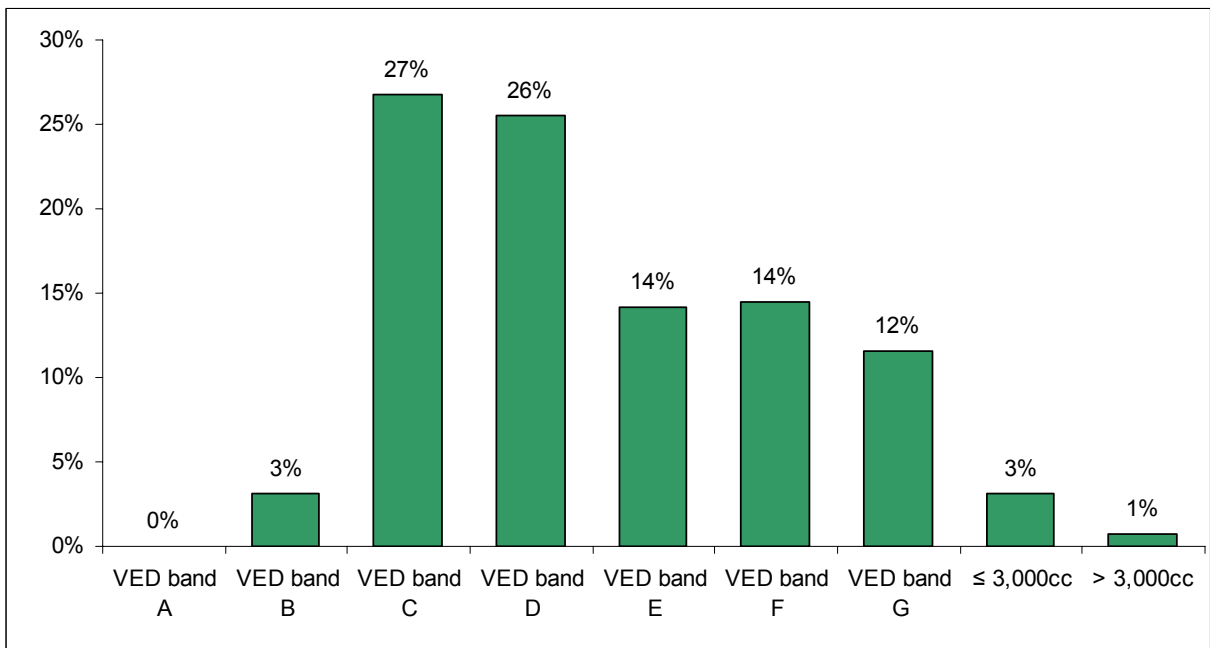
Figure A.5: Percentage of unique residents' discount cars in the Congestion Charging zone by VED band (post-March 2001 registrations) or engine capacity (pre-March 2001 registrations)



Cars registered on the fleet scheme

- A12. Cars used by companies tend to be newer than privately owned cars. Around 45 per cent of new car registrations in London in 2006 were with companies and of the cars on the fleet scheme seen in the Congestion Charging zone, a much smaller proportion are registered before March 2001 than all cars seen in the zone. Company cars are more likely to have mid-range CO₂ emissions (for example VED bands D and E) than have the highest levels of CO₂. However, while there is a higher proportion of cars in the mid-range in terms of CO₂ emissions (around 70 per cent in bands C to E compared with around 30 per cent of all cars), the proportions of cars with higher CO₂ emissions are similar for cars on the fleet scheme in the zone compared with all cars seen (around 30 per cent in bands F and G) and the proportions of these cars are still higher than for cars registered nationally (around 20 per cent in bands F and G).
- A13. Compared with all cars in the charging zone, a slightly smaller proportion would be subject to the higher charge (13 per cent), mainly due to the smaller proportion of pre-2001 cars on the fleet scheme, and a slightly larger proportion would qualify for the low CO₂ discount (2 per cent). The emissions related congestion charging proposals could encourage fleet operators to purchase a higher proportion of band B cars. This could have an impact on the vehicle fleet in London and nationally as fleet cars tend to flow through to the second-hand car market more rapidly than other cars.

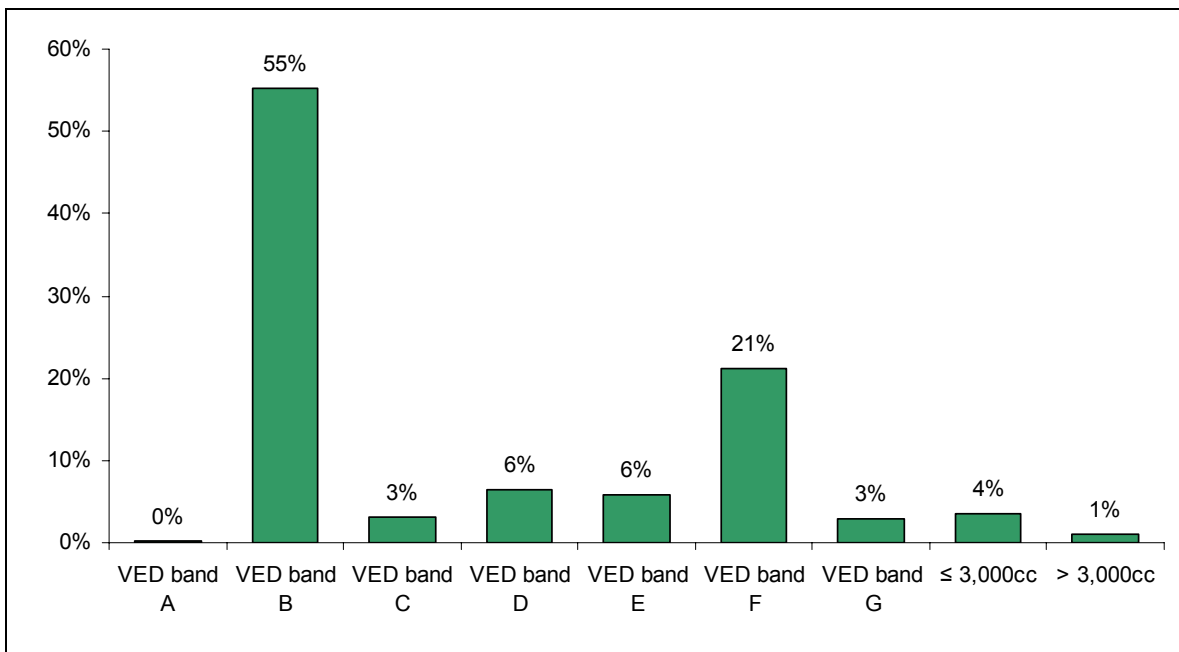
Figure A.6: Percentage of unique cars registered on TfL’s fleet scheme seen in the Congestion Charging zone by VED band (post-March 2001 registrations) or engine capacity (pre-March 2001 registrations)



Vehicles registered for the alternative fuel discount

A14. Of cars registered on the alternative fuel discount scheme, around half of those using the Congestion Charging zone are band B. However, around half of these cars would potentially not meet the Euro 4 air quality emissions requirement for the low CO₂ discount. Accordingly, around one quarter of alternative fuel discount cars seen in the zone would qualify for the low CO₂ discount. Around four per cent of alternative fuel discount cars would be subject to the higher charge.

Figure A.7: Percentage of cars registered on the alternative fuel discount scheme in the Congestion Charging zone by VED band (post-March 2001 registrations) or engine capacity (pre-March 2001 registrations)



Appendix B: Map of extended Central London Congestion Charging Zone

