Going Green

How local authorities can encourage the take-up of lower-carbon vehicles

Chris Hanley
SKM Colin Buchanan
November 2011

RAC Foundation

The Royal Automobile Club Foundation for Motoring Ltd is a charity which explores the economic, mobility, safety and environmental issues relating to roads and responsible road users. Independent and authoritative research, carried out for the public benefit, is central to the Foundation's activities.

RAC Foundation
89–91 Pall Mall
London
SW1Y 5HS

Tel no: 020 7747 3445
www.racfoundation.org

Registered Charity No. 1002705

This report has been prepared for the RAC Foundation by Chris Hanley (SKM Colin Buchanan). The report content reflects the views of the author and does not necessarily represent the views of the RAC Foundation.

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Acknowledgements

The author would like to thank the local authorities who participated in the research study and provided case studies for the report. The author is also grateful to Atholl Noon, Joseph Sladen and Jo Boyd-Wallis (SKM Colin Buchanan) for their support in conducting the research and reporting on the local authority survey findings. Special thanks are given to Luca Lytton (RAC Foundation) and David Quarmby CBE (RAC Foundation) for their helpful comments and discussions during the preparation and writing of the report.

About the author

SKM Colin Buchanan's Chris Hanley has over eight years' experience working on a variety of low carbon travel projects. His work focuses on offering expert advice to shape transport climate change strategies for local authorities in order to optimise reductions of ground-based carbon emissions. He has also project-managed the delivery of emissions-based parking policies for a number of large public sector organisations. His recent article published in *Traffic Engineering and Control* (June 2011) entitled 'Time for a radical rethink on emissions targets' has stimulated debate on where the future balance between public and private sector funding lies in stimulating the (ultra-)low carbon vehicle market.

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RAC Foundation Viewpoint

The RAC Foundation has a strong interest in the development and adoption of cars which use less fuel and emit less carbon – whether this is achieved by improved fuel efficiency, hybrid power trains, plug-in electric power or alternative fuels. The rationale is simple: to protect the mobility of road users from the rising cost of fuel and energy – not only as increasing oil prices work their way through to the filling station, but also with the possible introduction of carbon taxes on energy consumption.

Almost two thirds of all trips are made by car, accounting for three quarters of all weekly mileage.[1] While some shift of travel from car to bus, train, cycle and foot does take place in the face of rising fuel prices, for many essential journeys there is no practical alternative to the car.

This is the Foundation's fourth report on low carbon vehicles.[2] It explores the potential contribution that local authorities can make in encouraging their use, helping to protect mobility while also making progress towards the nation's carbon reduction targets. It was commissioned by the Foundation from consultants SKM Colin Buchanan.

In this report we distinguish between 'ultra-low carbon vehicles' (ULCVs) and 'low carbon vehicles' (LCVs), and describe them collectively as (U)LCVs.[3]

Progress in reducing carbon emissions from cars

Considerable progress has been achieved through government fiscal and regulatory instruments to encourage lower carbon vehicles, and to bring down the average carbon emissions of UK cars. These measures include the company car tax scheme and the graduated vehicle excise duty for all cars, coupled with the EU regulatory requirement on car manufacturers to reduce the average CO_2 emissions of their new car sales to 130 gCO_2/km by 2015. Average new car CO_2 emissions fell by 3.5% in 2010 and have declined by 20.3% since 2000.[4] The automotive industry across the world has risen to the challenge of improving energy efficiency.

The UK Government has a policy of encouraging the early market in plug-in electric vehicles. It has introduced consumer incentives for the purchase of electric vehicles, and a matched-funding scheme for local authorities to lead

1 Lucas, K. & Jones, P. (2009). *The Car in British Society.* London: RAC Foundation.

2 The first three were: Lytton, L. (2010). *Driving Down Emissions: The potential of low carbon vehicle technology;* Lane, B. *(2011). Market Delivery of Ultra-Low Carbon Vehicles in the UK: An evidence review*; and Lytton, L. (2011). *Shades of Green: Which low-carbon cars are the most eco-friendly?*

3 Ultra-low carbon vehicles (ULCVs) have tailpipe emissions of less than 75 gCO_2/km (and are typically plug-in electric and hybrid cars, and fuel cell vehicles), and qualify for the Government's car grant of £5,000; low carbon vehicles (LCVs) emit less than 100g (but not less than 75g) tailpipe CO_2/km (and are typically super-efficient internal combustion engines with hybrid or other energy-saving features).

4 SMMT (2011). *New Car CO_2 Report 2011*. London: Society of Motor Manufacturers and Traders.

programmes for the installation of electric vehicle charging points. Other policy initiatives to encourage such installations are in progress.

Yet the CO_2 reduction targets for the transport sector incorporated in the Government's climate change programme are very demanding. The Committee on Climate Change estimates that by 2050, emissions will need to be reduced by 91% from 2008 levels (by 90% from 1990 levels).[5] It is doubtful whether the current fiscal and regulatory measures will deliver a sufficiently fast and sustained reduction to achieve the car emissions share of the intermediate targets by 2020 and 2030. Market penetration of plug-in electric vehicles is forecast to be still quite modest by these dates, with the most optimistic scenario for electric vehicle adoption being 6.4% of total car sales in 2020.[6] What are the prospects for the other technologies (hybrids, for example) and continuing efficiency improvements to bring about the necessary carbon reductions – and protect road users from escalating fuel prices?

Alongside the government fiscal and regulatory incentives, can local authorities help? Are there measures which they can deliver which incentivise – perhaps 'nudge' – the adoption of lower carbon vehicles, using, for example, their planning, traffic management, parking and other powers?

The potential role of local authorities in nudging the use of low carbon vehicles

In a crowded landscape of research and investigation into low carbon vehicles and their future, the RAC Foundation was surprised to find that the role of local authorities and their powers to incentivise had not been seriously investigated. The Foundation set out to explore the potential for local authorities to help, examine whether they should be encouraged to do so, and see what contribution they can make – without unreasonably penalising those who are, for the time being, unable to afford to switch to lower carbon vehicles.

The Foundation therefore commissioned SKM Colin Buchanan to carry out a study to explore:

- what powers local authorities have in Great Britain which could be used to nudge the adoption and use of low carbon vehicles;
- to what extent these have been applied, and what impacts they have achieved;
- the appetite among local authorities – at officer and/or elected member level – to utilise these powers; and
- what lessons there are, if any, to be learnt from city experience in other EU countries.

5 See www.theccc.org.uk/sectors/surface-transport (retrieved 14 September 2011).
6 AEA (2009). *Market outlook to 2022 for battery electric vehicles and plug-in hybrid vehicles. Report to the Committee on Climate Change*. Didcot: AEA Group.

The study involved a review of current and prospective relevant legislation, an online survey of local authorities in Great Britain, and a review of experience in a small number of European cities. Their report follows this introduction.

Current local transport policy

What is the policy context? The Department for Transport published a White Paper[7] in January 2011 setting out a wide-ranging set of policies and actions for local authorities, with the aim of facilitating growth and cutting carbon. Its focus is on actions at the local level leading to local solutions – but then coming together to deliver progress at the national level.

While there is a recognition that reducing carbon emissions of the vehicles themselves has a contribution to make to overall carbon reduction, the overwhelming focus of the White Paper is on local authorities seeking to change travel choices and travel patterns as the primary means of cutting transport carbon emissions in their areas. No evidence is offered as to the likely extent of carbon reductions which such measures could be expected to achieve, but experience so far in various demonstration projects suggests that they would be relatively modest, with the recent Sustainable Travel Demonstration Town initiatives delivering a 9% reduction in car driver trips and a 5–7% reduction in the distance travelled by car over three years.[8]

Such attention as there is on technology solutions for carbon reduction focuses on plug-in electric vehicles. Important though this is for the longer term, electric vehicles will make relatively small contributions to transport carbon reduction over the next 15 years. It is surprising that there is no mention in the White Paper of the opportunity to use the powers as they currently exist to incentivise the use of lower carbon vehicles of all kinds. The RAC Foundation hopes that this report will help to fill that gap.

Local authorities do have relevant statutory powers and responsibilities

The SKM Buchanan report identifies several pieces of planning, traffic regulation, environmental and other legislation which local authorities could use to incentivise the use of vehicles with lower carbon emissions. Some of these relate to air quality rather than carbon emissions as such, and raise the question of how much alignment there is between climate change mitigation and air quality management.

In addition, there are a number of relatively new specific powers and duties relating to plug-in electric vehicles, as well as various policies and guidance, and some prospective regulation.

7 *Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen,* Cm 7996
8 Sloman, L., Cairns, S., Newson, C., Anable, J., Pridmore, A. & Goodwin, P. (2010). *The Effects of Smarter Choice Programmes in the Sustainable Travel Towns: Summary Report.* London: DfT.

Planning regulations increasingly require local authorities to have regard for policies that will promote both mitigation of and adaptation to climate change effects. But the specific policies tend to focus on the provision of electric charging points in new developments and infrastructure – for example in the draft National Planning Policy Framework (July 2011). Despite these developments, the study found little evidence of planning policies being used to incentivise the use of lower carbon vehicles in general.

Parking: traffic regulations – particularly the Road Traffic Regulation Act (RTRA) 1984 – provide broad powers to introduce lower carbon incentives in public parking schemes, both residential on-street and public off- and on-street parking. New permitted development rights have been enacted to allow local authorities to install electrical outlets for recharging electric vehicles in off-street public and private car parks without the need to apply for planning permission, and amendments have also been made to clarify that local authorities can install on-street charging points for electric vehicles as permitted development. About a quarter of the local authorities surveyed had implemented or were progressing (U)LCV incentives in residential on-street parking, and a third were progressing incentives for public on- and off-street parking. Some of these are focused specifically on plug-in electric vehicles, usually associated with charging points.

Highway and access measures can be provided through the RTRA 1984 and the Environment Act 1995 – for example LCV- or ULCV-only lanes, or the inclusion of carbon emissions as a feature of congestion charging. There is relatively little use of these powers: the well-known London Congestion Charging Scheme exempts vehicles emitting under 100 gCO_2/km – and the London Borough of Hounslow is exploring the introduction of a (U)LCV lane.

Local authority procurement and the supply chain:
Local authorities can make a contribution through own-fleet procurement, and by requiring their supply chains to meet certain vehicle emission targets. The Cleaner Road Transport Vehicles Regulations 2011 support exactly this.

In all, the SKM Colin Buchanan report lists 12 statutory powers available to local authorities which in different ways can be used to encourage the use of low or ultra-low carbon vehicles.

Plug-in electric cars – the ultra-low carbon vehicle

The Government's major initiative to encourage and promote plug-in electric

vehicles (and their hybrid variants), planned and delivered through OLEV,[9] is manifested through the £5,000 car grant for cars emitting less than 75 gCO_2/km, and the Plugged-In Places programme, which grants aid and facilitates the provision of charging infrastructure in local authority-led projects.

OLEV also provides a leadership role in this area on behalf of government, proposing a range of other measures to ease the path for electric vehicle developments, such as establishing a 'permitted development right' for the installation of charging points; working with Ofgem (the Office of the Gas and Electricity Markets) to remove regulatory barriers to the sale of electricity at charging points; and establishing common standards for charging systems and protocols.

It is not surprising that the survey of local authorities by SKM Colin Buchanan demonstrated widespread interest in supporting, or participating in, schemes to promote the provision of electric charging points. As the facilitation of pure electric and plug-in hybrids is a feature of many planning and transport policy documents – and rather more so than for lower carbon vehicles generally – effort and resources in local authorities are increasingly focused on the facilitation of the plug-in vehicle.

But a number of the local authority respondents to the survey noted that the take-up of plug-in electric vehicles is currently very low, and more particularly that the barriers of vehicle cost, range and unknown battery life appear to be very significant in the market place. The Foundation is concerned that a strong focus by local authorities (and by central government in its policies and advice) on plug-in electric vehicles will divert attention from achieving much larger impacts on carbon emissions through incentivising the use in their areas of lower carbon vehicles generally – whatever their technology. We fear that progress overall in achieving lower carbon emissions and greater energy efficiency may be blunted – thereby affecting the cost of mobility for those dependent on cars over the next 10 to 15 years.

Air quality and climate change

Local authorities already have statutory responsibilities in relation to air quality. But there are no equivalent statutory duties or powers of local authorities to encourage carbon emission reduction alongside the national initiatives, which might be considered surprising given the importance of climate change and the Government's commitment to greenhouse gas reductions. And there is virtually no 'joining up' of policies or regulation at central government or EU level, so as to link air quality improvements with carbon emission reductions.

Can air quality powers be deployed to support carbon emission reductions? There are three issues:

9 The Office for Low Emission Vehicles – a cross-Whitehall team sponsored by three departments: Transport; Business, Innovation and Skills; and Energy and Climate Change.

- A potential conflict arises in relation to diesel engines, which achieve lower carbon emissions at the tailpipe for a given level of performance, but up to now generate other emissions (PM_{10} and NO_2) that negatively affect air quality more than petrol engines. However, all new diesel engines sold since the beginning of this year meet the Euro 5 standard which removes PM_{10}, and by 2015 NO_2 emissions of new diesel engines will be in line with those of petrol ones.
- Second, air quality is about concentrations of specific elements in the atmosphere monitored against statutory thresholds, while CO_2 policy and assessment focus on emissions *per vehicle* (with no statutory local thresholds or local targets). However, the objectives are more convergent than this distinction would suggest, since the purpose of reducing emissions per vehicle is to reduce total transport carbon emissions.
- Third, even where policies for air quality and carbon emission reduction can be aligned, there seems to have been little appetite so far among local authorities facing air quality issues to generate serious policy action which achieves results.

There clearly are opportunities to tie air quality duties and responsibilities together with the carbon emission reduction imperative, and to establish how the increasing use of lower carbon vehicles can contribute to both policy objectives.

But aligning relevant legislation and regulations in this way is something that only central government can do. A very modest start has been made with new legislation requiring local authorities to have regard for both air quality and carbon emissions in their own vehicle procurement. Government needs to grasp its role in making sense of this for wider application. Meanwhile, government should promulgate, as best practice, local initiatives such as the Low Emissions Strategies Partnership with their work in Greenwich and Camden.

Local authority use of incentives in practice

SKM Colin Buchanan invited all local authorities in Great Britain to participate in an online survey, to discover: the place of carbon reduction plans in their wider transport and planning policy frameworks; what incentives were being considered, planned and implemented; and what their attitudes and appetites were for the wider application of such measures. The response rate of nearly 30% gave a good spatial spread of results, but it is recognised that responses were more likely to come from authorities with some prior commitment and enthusiasm in this area.

Nevertheless, there was considerable variation in the consideration or application of measures to encourage the use of lower carbon vehicles. Few authorities included reference to low or ultra-low carbon vehicles in their many local policy documents, although one third mentioned them in their Climate Change Strategies, and over half referenced them in their Local Transport Plans.

Less than a third had implemented Low Emission Zones (LEZs), and virtually

all these were related to air quality alone; several identified potential conflicts between air quality improvement strategies and reducing vehicle carbon emissions through encouraging (U)LCVs.

The use of planning policies to encourage (U)LCVs was focused entirely on the provision of charging infrastructure for plug-in electric vehicles, with a third of respondent authorities having standards either implemented or in progress. Over half pf the authorities were providing or progressing free electricity at public charging points. About half of the responding authorities were part of the Government's Plugged-In Places scheme.

Reducing residential parking charges was the most widely used application of parking powers to incentivise (U)LCVs, with a quarter of respondents reporting schemes implemented or in progress; priority for on-street or public off-street parking was in progress in over a quarter of authorities responding, but this was largely focused on electric vehicles rather than lower carbon cars in general. Other parking priority measures (business permits, residential parking space allocation, and general reduced parking charges) were not popular.

There were virtually no highways and access measures favouring (U)LCVs – with the well-known exception of the London Congestion Charging Scheme, which provides free access to vehicles registered as emitting less than 100 gCO_2/km.

The most popular measure overall – and arguably the least controversial – was the progressive adoption of (U)LCVs in local authorities' own fleets, with two thirds reporting positive results. About a quarter are developing procurement procedures to require or encourage suppliers to use (U)LCVs.

The appetite for using various measures to incentivise lower carbon vehicles was explored through the survey, taking respondents' 'reading' of their own authorities' policies. In general, they were:

- **for** marketing and travel awareness campaigns; high availability of public charging points; lower parking charges for (U)LCVs; introduction of charging points in parking bays;
- **neutral** about priority or reserved parking places; allowing (U)LCVs privileged access to restricted zones;
- **against** allowing special access for (U)LCVs to bus lanes; reducing council tax for residents with (U)LCVs.

Concerns underlying these positions include:

- the issue of vehicle cost as a major barrier to encouraging the uptake of (U)LCVs;
- the risk that (U)LCVs might be encouraged at the expense of other modes such as walking, cycling or bus travel, as they still contribute to congestion, however 'green' they are;

- how ‘green’ electric vehicles really are in general, given today’s estimate of the future carbon content of grid electricity.

Experience from elsewhere in Europe

There are a number of lessons that can be learnt from elsewhere in Europe:

- EU examples illustrate more radical approaches to incentivising (U)LCVs, such as the use of large-scale vehicle rental and instant-hire schemes, and the restriction of highway access to (U)LCV vehicles in protected areas.
- Larger, higher-profile initiatives focus on a co-ordinated programme for incentive measures on a citywide scale; this includes consolidated public sector vehicle procurement programmes for acquiring lower carbon vehicles.
- Smaller schemes are most successful when they focus on a particular journey interchange, such as park-and-ride locations at rail stations and airports, providing electric vehicle charging points.
- Some German cities have introduced LEZs restricting city centre access for all vehicles to those meeting specified Euro engine emission standards; however, these LEZs relate to air quality standards not carbon emission levels.

Conclusions and recommendations

Local authorities do have a range of planning, parking and traffic management powers which could be deployed to nudge the use of lower carbon vehicles. There are a small number of examples where these have been used – particularly the London Congestion Charging zone, which is free for vehicles under 100 gCO_2/km – but there is insufficient evidence so far to indicate their effectiveness.

So far there is relatively little appetite among local authorities to consider and implement planning and traffic management measures to encourage lower carbon vehicles. Local authorities are, however, taking steps to ‘green’ their own fleets through procurement procedures, and this is being increasingly extended to the fleets in their contractors’ supply chains – an uncontroversial measure, though not always affordable. A number of authorities have also introduced residential parking charges graded by carbon emissions. The lack of enthusiasm to use the powers at their disposal seems to reflect the potentially controversial nature of local measures which could put the owners of lower carbon vehicles at an advantage in terms of charges or access.

There is a particular focus at this time on the encouragement of plug-in electric vehicle. New planning policies set out standards for the provision of charging points in new developments, and the Government’s own programme delivered through OLEV seeks to kick-start electric vehicle take-up in the market through the qualifying £5,000 car grant, the Plugged-In Places programme for public charging points, and other policy and regulatory

measures which ease the adoption of electric vehicles.

The Foundation welcomes and supports this set of initiatives as contributing to the long-term decarbonisation of road transport, but it is widely understood that the effect on transport carbon emissions of the likely market penetration of plug-in electric vehicles over the next 10 to 15 years will be modest, largely because the current consumer barriers of cost, inconvenience and range may take some time to be mitigated.

Unsurprisingly, there is widespread interest on the part of the local authorities responding to the survey to play their part in this programme, but the RAC Foundation's concerns about the likely rate of market adoption due to these barriers were echoed by some in their responses.

The Foundation is concerned that a strong focus by local authorities (and by central government in its policies and advice) on plug-in electric vehicles will divert attention from achieving much larger impacts on carbon emissions through nudging the use of lower carbon vehicles in their areas – whatever the technology involved (be it more efficient internal combustion engines, hybrids of various kinds, or other systems).

Even in these times of 'localism', local authorities look to central government for advice, policy focus and funding, as well as statutory powers and duties. The most recent policy advice to local authorities in England about transport carbon reduction is the 2011 White Paper *Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen*. Strangely, this virtually ignores the opportunity to reduce carbon emissions through the encouragement and incentivising of lower carbon vehicles. The overwhelming focus of the White Paper is on local authorities seeking to change travel choices and travel patterns as the primary means of cutting transport carbon emissions in their areas. It has to be said that experience so far in various demonstration projects suggests that they would be relatively modest.

Such attention as there is on technology solutions in the White Paper focuses on plug-in electric vehicles – which, as we have argued, are unlikely to make significant contributions to carbon emission reduction in the next 10 to 15 years, although we recognise their significance in the longer term.

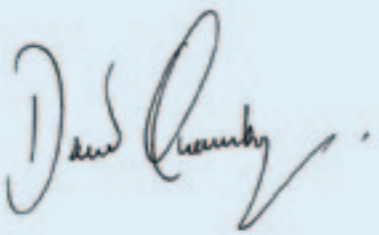
Dealing with air quality has long been a statutory responsibility of local authorities. There is a strong synergy between improving air quality and reducing carbon emissions, although we recognise that there is not a perfect alignment. Given that local authorities currently have no statutory duties in relation to carbon emissions reduction – which itself is odd given the strategic importance of the climate change agenda – we were surprised to discover virtually no linkage being made or recognised between the two at local authority level (with a few notable exceptions), and certainly no linkage being made in central government policies.

We believe that there is the opportunity to tie air quality duties and responsibilities together with the carbon emission reduction imperative, and to understand how the increasing use of lower carbon vehicles can contribute to both policy objectives. But this alignment is something that only central government can effect. The new legislation requiring local authorities to have regard for both air quality and carbon emissions in their own vehicle procurement is a small start. Government needs to grasp its role in making sense of this.

In summary, both the powers and the opportunities do exist for local authorities to nudge the adoption and use of lower carbon vehicles far beyond the level at which they are currently being deployed, to help deliver reductions in transport carbon emissions on a larger scale and in a shorter timescale than the present focus on plug-in electric vehicles is likely to achieve. The Foundation wants to see these opportunities being grasped and progressed, because of their importance in maintaining mobility for those who depend on their cars in their daily lives, particularly in a context of continually increasing pump prices, and bearing in mind the future possibility of carbon-related energy taxes. Meanwhile, current experience of using these measures (for example in residential parking) should be promulgated through best practice. And the latest statutory requirements for local authorities to have regard for both air quality and carbon emission reduction in their own fleet procurement should be commended.

Our recommendations are as follows:

- Both local authorities and central government should recognise the importance of measures which can be taken at a local level to encourage the adoption of all types of lower carbon vehicles – not just plug-in electric vehicles.
- Planning, parking and traffic policies currently focusing on plug-in electric vehicles should be modified to also include the adoption of (technology-neutral) measures to encourage lower carbon vehicles.
- Local authorities should be encouraged to build on what works in those places where incentive schemes have been introduced (for example in residential parking), and an evaluation of the impact and effectiveness of these measures should be carried out and reported.
- A study of how effectively to tie together and align air quality responsibilities with carbon emission reduction objectives should be undertaken jointly by representatives of central and local government in England.



David Quarmby
Chairman, RAC Foundation

Executive Summary

Throughout this report, the following definitions apply:

- A low carbon vehicle (LCV) emits less than 100 gCO_2/km from the exhaust (but not less than 75g); examples include hybrid cars such as the latest Toyota Prius range.
- An ultra-low carbon vehicle (ULCV) emits less than 75 gCO_2/km from the exhaust; examples include full electric vehicles such as the Mitsubishi i-MiEV and Nissan LEAF. Plug-in hybrid, extended-range and hydrogen-powered vehicles would also be classified as ULCVs.
- Where the two categories are considered together, the acronym (U)LCV is used, incorporating all vehicles emitting less than 100 gCO_2/km.

Liquefied petroleum gas (LPG), compressed natural gas (CNG) and biofuel-powered vehicles are not a key focus of this report. Emissions from these fuels vary with engine style and technologies; these will be considered where appropriate when reviewing the effects on air quality emissions.

Local authorities have opportunities through their planning, traffic management and transport powers to influence, or 'nudge', the use of (U)LCVs in their respective areas. The RAC Foundation sought explore what these powers are, the level of appetite among local authorities for using them, and what experience of their use had been gained so far, both in the UK and continental Europe.

The RAC Foundation commissioned transport specialists SKM Colin Buchanan to investigate these issues further, with the key research question tackled being:

> What powers do local authorities have, whether transport/traffic, planning or otherwise, to encourage the adoption and use of (ultra-)low carbon vehicles in their areas and how are these being used in practice?

More specifically, answers were sought to the following questions:

- How do air quality targets and associated statutory obligations fit alongside the need to reduce vehicle tailpipe emissions?
- What are current local examples in the UK where incentives have been introduced through legislative powers, and what lessons can be learnt from them?
- What is the appetite for, and attitude towards, using these powers amongst local authorities?
- What can be learnt from continental European experience?

What local authority powers exist to encourage the take-up of (U)LCVs?

Local authorities can use the following powers to deliver incentives for (U)LCV measures:

Current **planning regulations** that stem from the Town and Country Planning Act (TCPA) 1990 (and now the Community Infrastructure Levy (2010)) which enable local authorities to mandate a minimum percentage of parking spaces to be fitted with charging points in new developments. Guidance in Planning Policy Guidance 13 (PPG13, updated 2011) (DCLG, 2011b) on the expectations of (U)LCV infrastructure is currently limited, although the inclusion of policy on plug-in vehicle infrastructure in the draft National Planning Policy Framework (July 2011) (DCLG, 2011a) will encourage local authorities to consider adopting policies to require plug-in vehicle recharging infrastructure in new domestic and workplace developments.

The Road Traffic Regulation Act (RTRA) 1984 (s.1, s.6 and s.22 as amended) has been predominantly used by local authorities to provide **parking incentives** for (U)LCV users. However, the situations in which it has been applied, particularly in terms of emissions-based parking policies, have been determined by how local authorities have interpreted the guidance worded 'for preserving or improving the amenities of the area through which the road runs or for any of the purposes specified in paragraphs (a) to (c) of subsection (1) of section 87 of the Environment Act 1995 (air quality)' (RTRA, s.1). The Traffic Signs Manual (DfT, 2010) will also be updated later this year to provide guidelines on suitable (U)LCV parking signage.

The Environment Act 1995, the RTRA 1984 and the Transport Act 2000 are the primary mechanisms by which local authorities can implement (U)LCV **highway and access measures**. This includes issuing a traffic regulation order to create a (U)LCV lane, introducing a Low Emission Zone or congestion charging. However, existing powers currently do not explicitly legislate for tackling air quality and carbon emissions jointly.

There are two other policy levers that help to shape other (U)LCV incentives: the Localism Bill 2010–11 (which allows, for example, for the setting up of (U)LCV-related social enterprises or the reduction of business rates), and the Cleaner Road Transport Vehicles Regulations (CRTVR) 2011 (which requires public authorities and other bodies to take into account whole-life environmental impacts when procuring or leasing road transport vehicles).

The Office for Low Emission Vehicles has also recently published *Making the Connection: The Plug-In Vehicle Infrastructure Strategy* (OLEV, 2011) which promotes amendments to powers and policies to roll out ULCV infrastructure at home, at work and in public, by:

- establishing a **Permitted Development Right** that will allow landowners to install plug-in vehicle (i.e. all electric, plug-in and extended-range hybrid

vehicles) charging points in car-parking areas without the need to apply for planning permission;
- establishing a **National Chargepoint Registry** that will allow charging point manufacturers and operators to make information on their infrastructure available in one place;
- supporting a common standard for **plug-in vehicle smartcards**, making it easier for users to access more than one scheme;
- **working with Ofgem to remove regulatory barriers**: Ofgem (the Office of the Gas and Electricity Markets) will consult this year on an exemption that makes it clear that charging point owners and operators can sell electricity via charging points at the market rate; and

Can reducing vehicle carbon emissions be delivered jointly with satisfying air quality targets?

The key difference between UK air quality and climate change policy is that air quality assessment focuses on concentrations of specific elements in the atmosphere monitored against statutory thresholds, while carbon assessment focuses on emissions per vehicle (with no statutory local thresholds or targets).

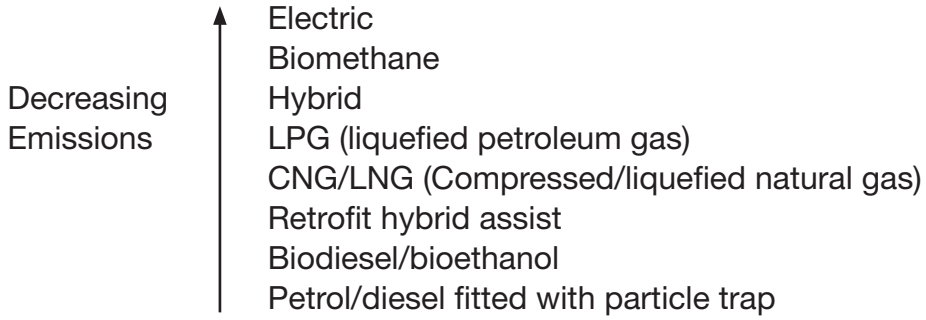
The relevant statutory thresholds for air quality are set out in EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe. This 2008 Directive was made law in England through the Air Quality Standards Regulations 2010.

The 2008 EU Directive acting alongside European Commission funding programmes such as CIVITAS (City-Vitality-Sustainability) and ELTIS (European Local Transport Information Service) aim to tackle urban air quality hotspots through implementing sustainable urban mobility plans to encourage the use of clean vehicle technology in urban areas. However, the Directive falls short of identifying any direct link between air quality and climate change co-benefits, neither does it include any mention of the mix of (U)LCVs that would help to deliver an urban mobility plan, or of any trade-offs or conflicts between air quality and carbon emissions.

Although ULCVs will generally deliver both carbon dioxide and air quality co-benefits, some trade-offs may occur with LCVs. For example, although small diesel vehicles may be more fuel-efficient and therefore more carbon-efficient, their use within city centres can be detrimental to air quality, compared to an equivalent petrol vehicle, depending on which Euro standard they comply with.

The London Borough of Camden has been using a hierarchy of vehicle fuels and technology for procurement of new vehicles. This is shown graphically in Figure A and takes into account PM_{10} (particulate matter less than 10 micrometres in diameter), NO_x (nitrogen oxides) and carbon emissions.

Figure A: Vehicle hierarchy of carbon emissions and air quality combined



Source: Esposito (2010)

There are definitely potential synergies between existing Acts of Parliament to jointly tackle air quality and carbon emissions, but any movement towards adapting specific legislation to deal with both aspects is as yet at an early stage. The CRTVR 2011 do offer the opportunity to tackle them both, through specifying that both carbon emissions and air quality emissions must be considered when local authorities are making vehicle procurement decisions in future. The only other expression of this type of joined-up policy as yet is through bodies such as the Low Emissions Strategies Partnership with their work in Camden and Greenwich.

Summary of survey 'appetite and attitude' responses, with UK and European examples

SKM Colin Buchanan developed a web-based survey and emailed an electronic link to it to all authorities in England, Wales and Scotland (207 authorities in total) over a two-week period in late May/early June 2011. The survey received responses from 58 authorities, making an overall response rate of 28%.

The aim of the survey consultation was to ascertain:

- the appetite for and attitude towards using (U)LCV legislative powers amongst local authorities and
- what can be learnt from continental European experience.

The key findings of the survey included:

Alongside purchasing (U)LCVs for the council's own fleet, parking and planning incentives are the most popular measures that local authorities are currently deploying, by means of the RTRA 1984 and the TCPA 1990 legislation. Requiring suppliers to increase (U)LCV use through procurement procedures is also increasingly popular, and should become a mainstream measure in all council policies next year following the introduction of the CRTVR 2011.

Highway and access measures to incentivise (U)LCVs had been implemented by few of the local authorities surveyed. This finding appears to be at odds with

the fact that it is possible to use a traffic regulation order under the RTRA 1984, following a similar process to that used for parking incentives (which were more popular). The conclusion that can be drawn from this is that highway and access measures are more expensive and/or more controversial to implement than parking or planning support measures, and perhaps less favourable from a political standpoint.

The distinction between ULCVs and LCVs was rarely made in local transport planning policy. However, local authorities do appear to distinguish between them when it comes to delivery of parking and planning incentives, tending to favour ULCVs, plug-in electric vehicles in particular.

The report includes a range of case studies from the UK and Europe, which highlight the following findings:

- UK initiatives build on either the Plugged in Places public charging point programmes and focus largely on parking incentives, incentivising procurement of (U)LCVs or the implementation of Low Emission Zones.
- EU examples identify more radical approaches to incentivising (U)LCV, such as the use of large scale vehicle rental schemes and restricting highway access to (U)LCV vehicles only in protected areas.
- The larger, higher-profile initiatives, both in the UK and in Europe, focus on a coordinated programme for (U)LCV measures on a city-wide scale. This allows, for example, consolidated public sector vehicle procurement programmes to enable partners to buy discounted (U)LCV fleets.
- Smaller schemes are most successful when they focus on a particular journey interchange, such as a park-and-ride site, typically at a rail station or airport, where, for example, electric vehicles can be left to recharge for a number of hours.
- The EU initiatives in particular impact on a range of trip types that have a high carbon impact which include commuting, business travel, leisure and personal trips.
- The schemes are heavily reliant on UK government or EU kick-start funding in the majority of cases.

Summary of powers in practice

The key findings of this report are shown in Table 3.1 (p. 30), which consists of a matrix of incentives. For each type of measure it considers the main and supporting legislation, its pros and cons, its effectiveness in encouraging use of (U)LCVs, trade-offs between reducing carbon emissions and meeting air quality objectives, the appetite (derived from the survey results) of local authorities to implement the measure, and case studies from which local authorities can learn.

1. What powers are available to local authorities?

1.1 Overview

The Climate Change Act 2008 legally binds the UK to achieving a reduction in greenhouse gas emissions of at least 80% by 2050 (from a 1990 baseline). An interim reduction target of 34% has been set for 2020. With transport representing 21% of the UK's greenhouse gas emissions (and around 25% of CO_2 emissions), there will need to be a significant shift from the current dependence on the internal combustion engine (ICE) to newer, cleaner technologies if these targets are to be met. More fuel-efficient ICE vehicles will play their part, but other emerging low carbon vehicle technologies will take on a significant role, particularly in the period 2020–50.

This report focuses on the legislation, powers and policies that can be used by local authorities to incentivise the use of (ultra-)low carbon vehicles in their areas. The primary research question to be tackled is:

> What powers do local authorities have, whether transport/traffic, planning or otherwise, to incentivise the adoption and use of (U)LCVs in their areas and how are these being used in practice?

Alongside the main research questions, there are four sub-questions that this report seeks to answer:

- How do air quality targets and associated statutory obligations fit alongside the need to reduce vehicle tailpipe carbon emissions?
- What are current local examples in the UK where incentives to adopt (U)LCVs have been introduced through legislative powers, and what lessons can be learnt from them?
- What is the appetite for and attitude towards using these powers amongst local authorities?
- What can be learnt from continental European experience?

The context in which these research findings are presented is the current fiscal offer from the Government, which includes:

- a 25% discount (capped at £5,000) on purchasing a ULCV;
- exemption from road tax for LCVs;
- exemptions from company car tax, and business fleet tax benefits.

In addition to the financial incentives for the individual, the Government is also funding the Plugged-In Place programmes, whereby it will provide funding to local authorities to support its Carbon Plan[10] commitment to install up to 8,500 charging points, with two rounds of funding announced so far:

10 The Carbon Plan is a government-wide plan of action on climate change, including domestic and international activity, which sets out each department's action and deadlines for the next five years. For more information, please visit www.decc.gov.uk/en/content/cms/tackling/carbon_plan/carbon_plan.aspx

- Plugged-In Places Round 1: awarded to London, Milton Keynes and the North East;
- Plugged-In Places Round 2: awarded to The Midlands, Greater Manchester, East of England, Scotland and Northern Ireland.

The following sections describe the environmental, planning and transport powers that local authorities have at their disposal when implementing measures that incentivise the use of (U)LCV, and also explore the impacts of these policies on meeting both climate change and air quality objectives. The next chapter then focuses on how these powers are being used in practice to incentivise (U)LCVs, and is followed by a summary of the main findings.

1.2 Planning and environment powers

Table 1.1shows the statutory powers and policy instruments available to local authorities for implementing incentives to encourage use of (U)LCVs. A description of each of the key legislative Acts has been provided, alongside a summary of the types of incentives that can be implemented by local authorities using the powers.

It should be noted that whilst the existing powers available to local authorities will be subject to change through the draft National Planning Policy Framework (NPPF) (July 2011), this report intends to provide more clarity to local authorities and developers about the type of incentives that could be expected, and requested, as part of new developments.

Table 1.1: Planning and environment powers

Statutory power or policy	Description	Incentives promoted
Draft National Planning Policy Framework (July 2011) (DCLG, 2011a)[11]	Local authorities should consider developments in the context of an overall need to reduce the use of high-emission vehicles. This will encourage local authorities to consider adopting policies to include plug-in vehicle recharging infrastructure in new domestic and workplace and retail developments.	Residential, workplace and communal charging points
Section 106 of Town and Country Planning Act (TCPA) 1990 & CIL (Community Infrastructure Levy (2010))	The TCPA 1990 secures developer contributions earmarked for sustainable infrastructure for a site. This was updated in 2008 through the Planning Act placing a new duty on local authorities to incorporate measures for both mitigating and adapting to climate change into Local Development Frameworks financed through developer contributions raised through CIL which came into effect in April 2010. Note: the key difference between s.106 and CIL is that CIL funds can be used collectively to install schemes for the local community (not necessarily directly benefiting the development), whereas s.106 contributions are exclusively for schemes providing facilities needed as a result of the development.	Residential and workplace charging points Communal charging points (CIL only)
Environment Act 1995 & EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe	This Act gives local authorities the power to implement Air Quality Management Areas (AQMAs) in areas where air pollution levels are exceeding EU target levels. In particular: s.83 – if an air quality review identifies that air quality standards or objectives are not being achieved in an area, the local authority 'shall by order designate [it] as an [AQMA]'; and s.87 – prescribes measures, including AQMAs, which are to be adopted by local authorities (in action plans or otherwise).	Low Emission Zones
Local Government Act 2000	s.2 on the promotion of well-being – this discretionary power enables a local authority to do anything it considers likely to promote or improve the economic, social or environmental well-being of its area, provided (s.3) that such action is not expressly forbidden elsewhere in legislation.	Electric vehicle charging infrastructure Low Emission Zones Emissions-based parking policies
Localism Bill 2010–11	Encourages more community involvement in designing local schemes, and delegation of certain powers to local authorities.	Encouraging sustainable social enterprises, e.g. (U)LCV car pools Business rate discounts
Local Government and Public Involvement in Health Act 2007	Encourages the setting up of local area and multi-area agreements to meet shared objectives and improve efficiencies.	(U)LCV shared procurement programme

11 This document was circulated for consultation in July 2011 and would potentially supersede: (a) the supplement to Planning Policy Statement 1, *Planning and Climate Change (2007)*, which encourages local authorities to create and secure clear opportunities for sustainable transport; (b) PPG13 (updated 2011), which promotes the use of projects to improve local air quality and ensures suitable parking availability for (U)LCVs.

1.3 Transport powers

Transport-specific powers and policies that local authorities can use to incentivise the uptake of (U)LCVs are shown in Table 1.2. The Office for Low Emission Vehicles (OLEV, a cross-government team that comprises people and funding from three government departments: Transport; Business, Innovation and Skills; and Energy and Climate Change) has also recently published *Making the Connection: The Plug-In Vehicle Infrastructure Strategy* (June 2011) (OLEV, 2011), which promotes the following measures to roll out ULCV infrastructure at home, work and in public:

- proposing the inclusion of policy on plug-in vehicle infrastructure in the draft **National Planning Policy Framework**, out for consultation in July 2011 – this will encourage local authorities to consider adopting policies to include plug-in vehicle recharging infrastructure in new domestic and workplace developments;
- establishing a **Permitted Development Right** that will allow landowners to install plug-in vehicle charging points in car-parking areas without the need to apply for planning permission;
- establishing a **National Chargepoint Registry** that will allow charging point manufacturers and operators to make information on their infrastructure available in one place;
- supporting a **common standard for plug-in vehicle smartcards**, making it easier for users to access more than one scheme;
- **working with Ofgem to remove regulatory barriers**. Ofgem (the Office of the Gas and Electricity Markets) will consult this year on an exemption that makes it clear that charging point owners and operators can sell electricity via charging points at the market rate; and
- **updating the *Traffic Signs Manual* (2010)** – amendment regulations are due to come into force in November 2011 which will include prescribed parking signs and bays.

Table 1.2: Transport powers

Statutory power or policy	Description	Incentives promoted
Road Traffic Regulation Act (RTRA) 1984	Traffic authorities can raise a traffic regulation order (TRO) under the RTRA 1984, for (amongst other reasons) preserving or improving the amenities of the area, or for any of the purposes specified in paragraphs (a) to (c) of subsection (1) of s.87 of the Environment Act 1995 (air quality) (see Table 1.1). These powers do not refer to climate change or carbon emissions, although measures introduced in relation to air quality may also reduce carbon emissions. The addition of 'reducing carbon emissions' as a permitted reason for making a TRO could be considered in future.	(U)LCV lanes (U)LCV and car club parking bays Route/access restrictions except for (U)LCVs
	The same RTRA 1984 powers can be used to introduce Low Emission Zones (s.1(1)(g) Environment Act 1995), although this clearly needs to be with the aim of achieving the purposes set out in the Act as described above.	Low Emission Zones in AQMAs
	Local authorities have used s.45 and s.122 of the RTRA 1984 to introduce differential emissions-based parking charges. In exercising its duties under the 1984 Act, a highway authority is under a duty to secure the expeditious, convenient and safe movement of traffic (including pedestrians), and suitable and adequate parking on and off the road. In meeting these duties, the authority must have regard to: • the effect on the amenities of any locality; • the National Air Quality Strategy prepared under s.80 of the Environment Act 1995; • any other matters appearing to the local authority to be relevant. These matters provide a legal basis for differential charging, based on carbon and other emissions.	Emissions-based parking charges
Road Vehicles (Construction and Use) Regulations 1986	Regulation 98 created a requirement for drivers to switch off their engines in parked vehicles.	Fixed penalty notices for stationary idling Driver training
Local Transport Act (2008)	Gives councils the ability to develop local road pricing schemes in a way that best meets local needs – whilst ensuring that schemes are consistent and interoperable. Sections 162 to 200 and Schedules 12 and 13 of the Transport Act 2000 contain the powers for local authorities to introduce road user charging and workplace parking levy schemes.	Congestion charging Workplace parking levies

The Cleaner Road Transport Vehicles Regulations 2011	Encourages local authorities to consider the following in purchasing fleet vehicles:
	• energy consumption;
	• carbon emissions; and
	• emissions of:
	  • oxides of nitrogen;
	  • non-methane hydrocarbons; and
	  • particulate matter.
		(U)LCV shared procurement programme

Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen (White Paper, 2011) (DfT, 2011)	The Government's specific aims for the policy are to: • minimise carbon emissions and promote accessibility through planning for the location and mix of development; • support reductions in greenhouse gas emissions and congestion.	Low Emission Zones Electric vehicle infrastructure

1.4 What role can air quality powers play in reducing carbon emissions?

The findings displayed in Tables 1.1 and 1.2 show that most of the climate change and air quality legislation in relation to lowering vehicle emissions has been set independently of each other. It was not until the CRTVR 2011 that both air quality and climate change were tackled under one policy.

The key difference between UK air quality and climate change policy is that air quality assessment focuses on monitoring concentrations of specified elements in the atmosphere against statutory thresholds, while carbon assessment focuses on calculating and measuring emissions on a per vehicle basis (with no statutory local thresholds or targets).

The relevant statutory thresholds for air quality are set out in EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe. This 2008 Directive was made law in England through the Air Quality Standards Regulations 2010. Local authority powers in relation to air quality are derived directly from this EU legislation, which includes the air quality objectives inherited from Framework Directive 96/62/EC and new air quality objectives for $PM_{2.5}$ (formerly PM_{10}, based on the size of particles; the subscript indicates the particle size in micrometres).

The 2008 EU Directive acting alongside European Commission funding programmes such as CIVITAS and ELTIS aim to tackle air quality hotspots by implementing sustainable urban mobility plans to encourage the use of clean vehicle technology in urban areas. However, the Directive falls short of identifying any direct link between air quality and climate change co-benefits, neither does it include any mention of the mix of (U)LCVs that could help to

deliver an urban mobility plan, or of any trade-offs or conflicts between air quality and carbon emissions.

Although ULCVs will generally deliver both carbon dioxide and air quality co-benefits, some trade-offs may occur with LCVs. For example, although small diesel vehicles may be more fuel-efficient (and therefore more carbon-efficient), their use within city centres can be detrimental to air quality compared to an equivalent petrol vehicle.

Table 1.3 shows the potential impacts on carbon emissions and air quality of switching to the different fuel types. Unless stated otherwise, the fuel comparisons have been made with conventional petrol ICEs.

Table 1.3: Indicative (U)LCV climate change and air quality impacts

Fuel type[12]	Impact	
	CO_2 emissions	Air quality
Low carbon vehicles		
Biofuels	+	(-)*
Conventional hybrid vehicles (petrol internal combustion engine + electric propulsion)	+	+
Diesel + NO_2/PM traps	-	+
Diesel vs. petrol	+	-
Lean petrol + NO_2 traps	++	++
Liquefied petroleum gas	+	++
Water-diesel emulsion	(+)**	+
Ultra-low carbon vehicles		
Compressed natural gas***	++	+
Full electric plug-in	+++	+++
Hydrogen	+++	+++
Plug-in hybrid (petrol-based)	++	++
Plug-in hybrid (diesel-based)	++	+

Source: Air Quality Expert Group (2007); Defra (2010)

* (dependent on blends and the production process)
** Tests have not been large enough to draw conclusive analysis.
*** Compressed natural gas cars are not generally available in the UK as the fuel is more suitable for larger vehicles

+++ = 80–100% savings on carbon emissions / insignificant or no air pollutants emitted
++ = 40–80% savings on carbon emissions / moderate saving on air pollutants
+ = up to 40% savings on carbon emissions / limited saving on air pollutants
- = up to 40% increase in carbon emissions / increase in air pollutants

12 The table considers only exhaust emissions for the purpose of this study. How the fuels are produced is equally important – for example, the unintended environmental impacts of the unsustainable production of biofuels are well documented.

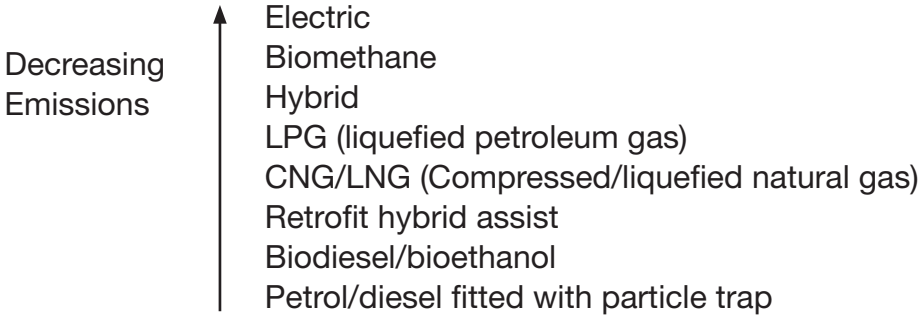
The table shows that all ULCVs will generally both benefit air quality and reduce carbon emissions, while most LCVs are also of benefit in both respects – the exceptions are biofuels and low carbon diesel-based cars. The analysis is a snapshot of those likely benefits/disbenefits, and the following points should also be taken into consideration:

- Reducing the sulphur content in all fuels could help to reduce all types of air emissions, so overall impacts will need to be adjusted accordingly.
- Although a few years ago some lean petrol filters would have caused a slight increase in carbon emissions due to engines needing to operate at stoichiometry (chemical balance), recent increases in engine technology and vehicle design have offset this.
- The effect of a diesel particulate filter on carbon emissions is variable by type and engine load conditions (which vary according to vehicle weight).
- Water-diesel emulsion targets reduction of NO_x and PM, and CO_2 emissions could be significantly less than for conventional diesel ICEs, but more comprehensive testing is needed.
- Biofuel impacts will depend on the blended mix between the biofuel and petrol/diesel.

The Low Emissions Strategies Partnership is working with a number of authorities to explore how an Enhanced Transport Assessment could provide a combined vehicle assessment for both climate change (CO_2) and air quality (PM, NO_x).

The London Borough of Camden has also developed a hierarchy of vehicle fuels and technology for procurement of new vehicles. This is shown graphically in Figure 1.1 and takes into account PM_{10} (particulate matter less than 10 micrometres in diameter), NO_x and CO_2emissions.

Figure 1.1: Vehicle hierarchy of carbon emissions and air quality combined



Source: Esposito (2010)

The Borough then developed the following procurement guidelines for new vehicles to ensure that fleets have the correct mix of light- and heavy-duty vehicles to help the Council to achieve climate change and air quality co-benefits.

Table 1.4: Vehicle fuel and technology requirements

Minimum compliance targets for vehicle purchase in 2010/11	Minimum compliance targets for vehicle purchase in 2011/12	Minimum compliance targets for vehicle purchase in 2012/13
Light-duty vehicles (cars/vans/minibuses)		
10% from options 1–3 50% from options 4–6 40% from options 7&8	15% from options 1–3 50% from options 4–6 35% from options 7&8	20% from options 1–3 50% from options 4–6 30% from options 7&8
Heavy-duty vehicles		
10% from option 2 50% from options 4&5 40% from options 7&8	15% from option 2 50% from options 4&6 35% from options 7&8	20% from option 2 50% from options 4&6 30% from options 7&8

Source: Esposito (2010)

The Council has also installed eco-monitoring devices to assist smarter driver training. The eco-monitor allows drivers to view change in fuel consumption and emissions as they drive, via a diagnostic system displayed on the vehicle's dashboard.

Another example of a local authority tackling air quality and carbon emissions jointly is provided by the London Borough of Greenwich. With air quality in parts of Greenwich falling below target levels, Greenwich Council used Section 130 of the Town and Country Planning Act (TCPA) 1990 to grant planning permission for the redevelopment of the Millennium Dome site and its surroundings in 2003 on the condition that the UK's first Low Emission Zone (LEZ) was implemented as part of the scheme. An LEZ is a specified area within which the most polluting (diesel-engine) vehicles are required to meet specific emissions standards. The standard considers concentrations of emissions of NO_x, total hydrocarbons, non-methane hydrocarbons, CO (carbon monoxide) and PM.

Following on from the implementation of initial controls, which focused on meeting Euro IV vehicle emission standards, in 2005 the development of the sustainable Greenwich Millennium Village presented an opportunity for the Council to evolve the LEZ concept to include carbon reduction criteria. Since then, the LEZ has not only delivered a co-benefit for air quality and climate change by accelerating the uptake of cleaner fuels and technologies, but has also raised awareness of pollution issues and of the cost-effective measures to tackle them.

1.5 Summary

The evidence from the review of statutory powers and policies shows that there is a wide range of powers available to promote carbon reduction, but that planning powers lend themselves more to wider sustainability and energy efficiency issues.

Transport powers are also generalised, with the main leverage coming through traffic regulation orders to implement Low Emission Zones, and the Local Transport Act (2008) to implement congestion charging and workplace parking levy schemes. This is despite a backdrop of government-led investment policy to actively encourage provision of (U)LCV public charging points, and pump-priming of (U)LCV local pilots.

The key enabling power for local authorities to be able to implement many (U)LCV incentives has been the Road Traffic Regulation Act (RTRA) 1984 (s.1, s.6 and s.22, which plays a role in implementing emissions-based parking charges, incentivising (U)LCV restricted access and implementing LEZs. However, the situations in which it has been applied have been determined by how local authorities have interpreted the guidance worded 'for preserving or improving the amenities of the area through which the road runs or for any of the purposes specified in paragraphs (a) to (c) of subsection (1) of section 87 of the Environment Act 1995 (air quality)' (RTRA, s.1).

There are definitely potential synergies between various Acts of Parliament to jointly tackle air quality and carbon emissions, but any movement towards adapting legislation to deal with both aspects is as yet at an early stage. The CRTVR 2011 constitute a new piece of legislation that offers the opportunity to both tackle air quality objectives and reduce vehicle carbon emissions. The only other expression of this type of joined-up policy as yet is through bodies such as the Low Emissions Strategies Partnership with their work in Camden and Greenwich.

The draft NPPF (July 2011) offers clear guidance to local authorities which directs them to minimise ground-based carbon emissions from new developments while removing barriers to installing electric vehicle charging points in residential, workplace and communal areas. It is considered that the Framework could go further, though, in terms of listing development-specific schemes that local authorities can deliver, and by promoting schemes that offer air quality and climate change co-benefits.

2. What evidence is there that these powers are being used in practice?

2.1 Overview

In order to understand how they have been using planning, environmental and transport powers to deliver measures and incentives to support the uptake of (U)LCVs, a consultation exercise was undertaken with local authorities.

The aim of the consultation was twofold. Firstly, it aimed to find out about initiatives being implemented across the country to incentivise the use and uptake of (U)LCVs. Secondly, it aimed to assess the enthusiasm and political willingness for incentivising (U)LCVs at the local level, comparing and contrasting the attitudes of officers in different authorities and departments.

Where relevant, specific UK examples are referred to in order to illustrate the analysis of results, alongside with lessons learnt from Europe.

2.2 Methodology

SKM Colin Buchanan developed a web-based survey and emailed an electronic link to it to all authorities in England, Wales and Scotland (207 authorities in total) over a two-week period in late May/early June 2011. The survey was also publicised in relevant online forums, including ACT TravelWise and the Sustainable Transport UK group on LinkedIn.

The majority of the survey asked the individual completing it to respond on behalf of their employer, i.e. their local authority. The final part of the survey asked local authority employees to answer a number of questions from their own personal point of view, speaking as professionals working in this field.

As the survey was designed to gather an overview of the situation across the country, the comments provided have not been attributed to individuals or particular local authorities except where local authorities themselves have been involved in the compilation of specific case studies, which are contained within the results narrative.

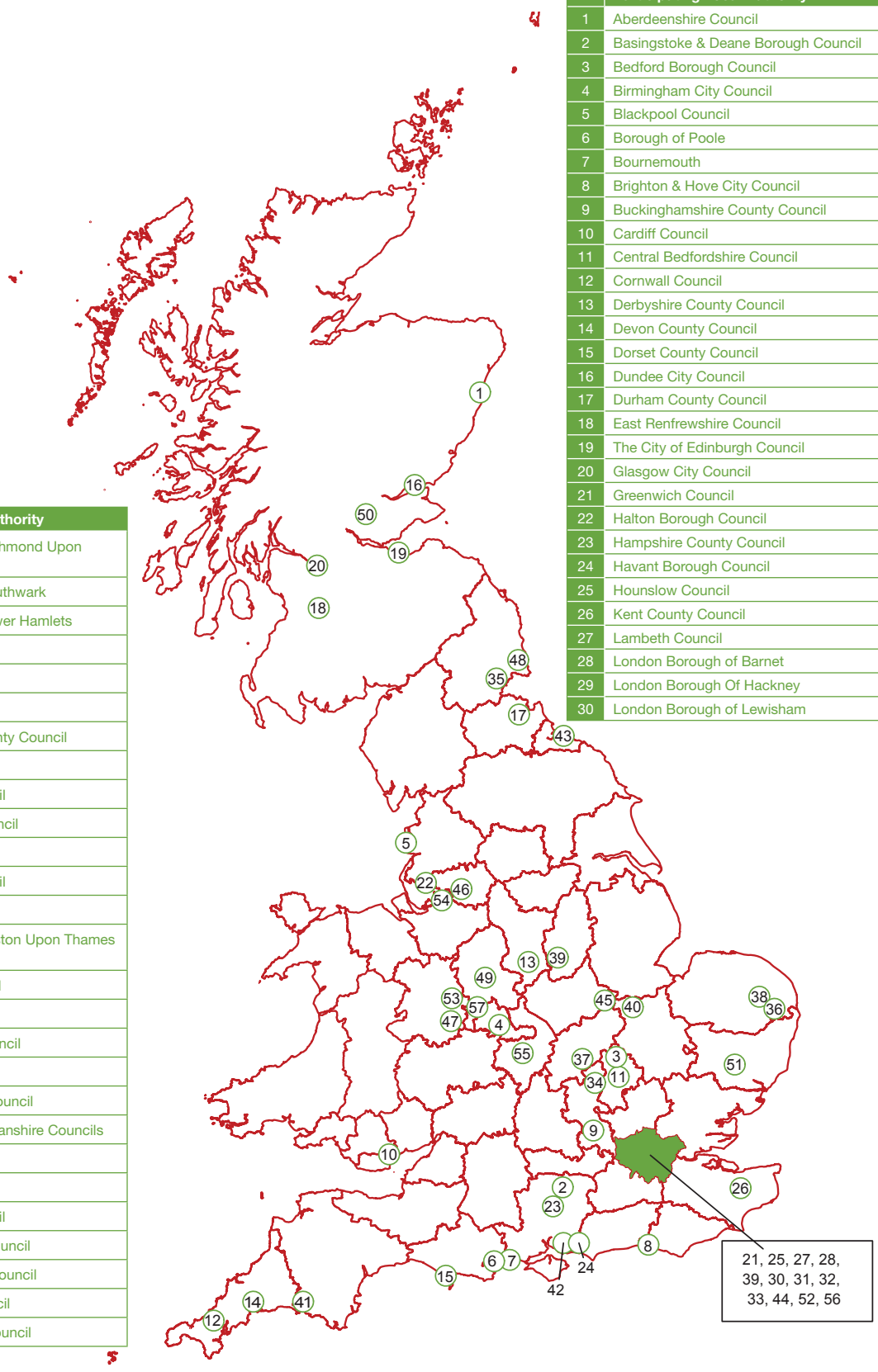
2.3 Results

2.3.1 Respondent profile

The survey received responses from 58 authorities, making an overall response rate of 28%. The geographical spread of local authorities is shown in Figure 2.1. While a good spatial spread of local authorities was obtained, it is acknowledged that authorities who are more heavily involved in (U)LCV promotion were more likely to take part, especially if there is a particular member of staff who has designated responsibility for this area. Notwithstanding this, the survey respondents also demonstrated a high degree of variation in progress towards either rolling out or having already implemented local incentives for (U)LCVs. Of the respondents, 10 were part

of Plugged-In Places Round 1, 15 of Round 2, and 30 were not part of the Plugged-In Places scheme (3 authorities did not respond to this question).

Figure 2.1: Location of responding local authorities

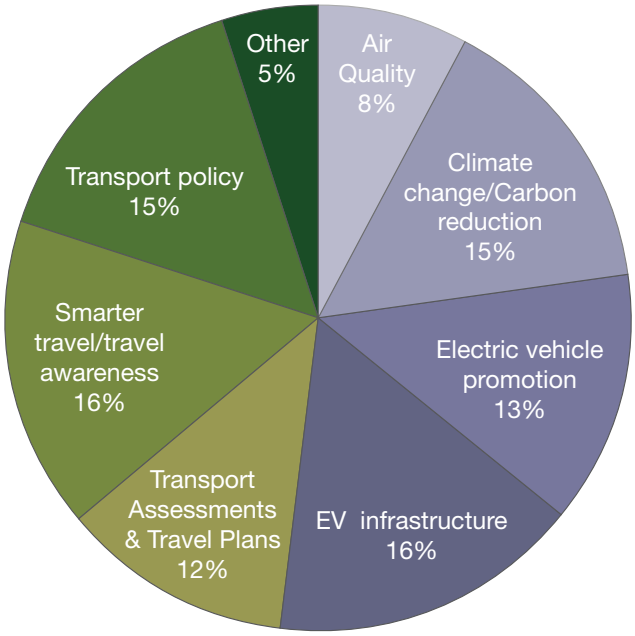


	Participating Local Authority
1	Aberdeenshire Council
2	Basingstoke & Deane Borough Council
3	Bedford Borough Council
4	Birmingham City Council
5	Blackpool Council
6	Borough of Poole
7	Bournemouth
8	Brighton & Hove City Council
9	Buckinghamshire County Council
10	Cardiff Council
11	Central Bedfordshire Council
12	Cornwall Council
13	Derbyshire County Council
14	Devon County Council
15	Dorset County Council
16	Dundee City Council
17	Durham County Council
18	East Renfrewshire Council
19	The City of Edinburgh Council
20	Glasgow City Council
21	Greenwich Council
22	Halton Borough Council
23	Hampshire County Council
24	Havant Borough Council
25	Hounslow Council
26	Kent County Council
27	Lambeth Council
28	London Borough of Barnet
29	London Borough Of Hackney
30	London Borough of Lewisham

	Participating Local Authority
31	London Borough of Richmond Upon Thames
32	London Borough of Southwark
33	London Borough of Tower Hamlets
34	Milton Keynes
35	Newcastle City Council
36	Norfolk county council
37	Northamptonshire County Council
38	Norwich City Council
39	Nottingham City Council
40	Peterborough City Council
41	Plymouth City Council
42	Portsmouth City Council
43	Redcar & Cleveland
44	Royal Borough of Kingston Upon Thames Council
45	Rutland County Council
46	Salford City Council
47	Shropshire County Council
48	South Tyneside Council
49	Staffordshire County Council
50	Stirling and Clackmannanshire Councils
51	Suffolk County Council
52	Surrey County Council
53	Telford & Wrekin Council
54	Warrington Borough Council
55	Warwickshire County Council
56	Westminster City Council
57	Wolverhampton City Council

Respondents were asked which section of a local authority they worked in. The responses are shown in Figure 2.2: 52% of respondents were either in a dedicated (U)LCV, climate change or air quality post (blue), while 43% worked within transport the fields of planning/policy or smarter travel (red).

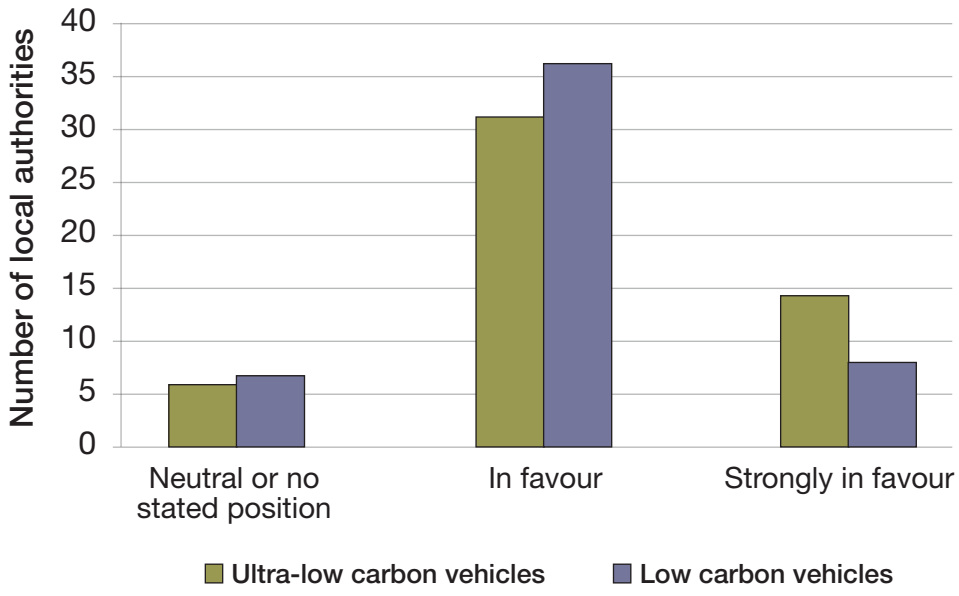
Figure 2.2: Department profiles of respondents



2.3.2 Support for (U)LCVs

The survey asked whether the respondent's local authority was in favour of supporting (U)LCVs; the results are shown in Figure 2.3. (Respondents were also provided with an option of indicating that their authority was 'not in favour', but as no authorities chose this option it has been omitted from the chart.)

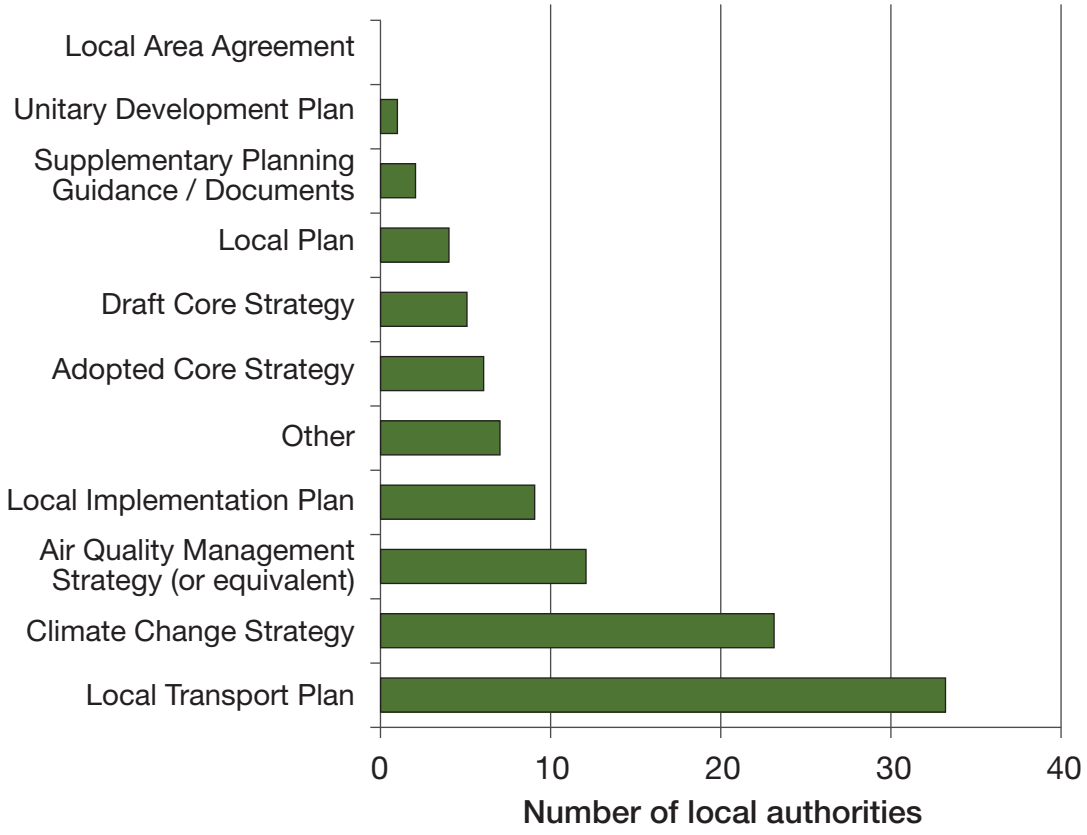
Figure 2.3: Local authorities' position on promoting (U)LCVs and LCVs



The majority of respondents stated that their local authority was in favour or strongly in favour of promoting (U)LCVs, with authorities more likely to state that they were strongly in favour of promoting ULCVs than LCVs. No respondent indicated that their local authority was against promoting (U)LCVs, although it is likely that self-selection of respondents has introduced survey bias towards local authorities in favour of promoting (U)LCVs.

The next question asked which of the council's policy documents contained a reference to (U)LCVs, and the results are displayed in Figure 2.4.

Figure 2.4: Local policy documents containing reference to (U)LCVs



As shown above, the document that most commonly referred to (U)LCVs was the Local Transport Plan, followed by an authority's Climate Change Strategy.

The evidence indicates that there is a significant potential to increase the variety and number of documents in which (U)LCVs are referenced in a particular local authority. There is an opportunity to further incentivise (U)LCVs at the strategic level, for example through Core Strategies, to ensure there is a top-down, coordinated approach. At the other end of the scale, authorities could also provide more detailed requirements and instructions on the implementation of (U)LCV facilities and measures through Supplementary Planning Guidance/Documents. Linking in with the draft NPPF (July 2011)

(DCLG, 2011: 22) guidance on encouraging electric vehicle charging infrastructure for new developments will be vital.

Regarding Low Emission Zones (LEZ), of those 17 respondents who said their local authority had implemented an LEZ, only 3 had deployed them to tackle both air quality and carbon emissions; the remainder were for air quality reasons only. This evidence shows that there is a greater potential to ensure that LEZs deliver both climate change and air quality co-benefits in the future, although there are potential conflicts between encouraging petrol over diesel and vice versa.

The survey also sought to identify potential conflicts of policy within the different departments of a local authority that might hinder the introduction of measures to support the use of (U)LCVs. Of the 50 respondents to this question, 8 identified a potential conflict, and these fell under one of three areas:

- limited availability of parking space, and/or reduced revenue (3 respondents);
- compromising sustainable travel objectives to reduce travel by private car (2); or
- reducing road safety benefits, particularly the low noise of ULCVs (3) which may pose a threat to pedestrians and cyclists.

The following subsections consider each of the incentives that local authorities are either considering or implementing to incentivise the uptake of (U)LCVs.

2.3.3 Charging infrastructure

The survey asked respondents to state how many publicly available charging points they currently had in their local authority, and what this number was projected to be in 2012, 2015 and 2020. There was a wide variation in responses, with a number of authorities stating that they had less than five charging points, or expected to have less than five by 2012, and with the majority unable to provide future projections beyond 2015.

In total, 37 authorities provided either the number of current charging points and/or the projected numbers, and the top ten responses by charging point volume are shown in Table 2.1. The projected numbers are indicative.

Table 2.1: Councils reporting the highest existing and/or predicted charging points

Council	Current (June 2011)	By 2012	By 2015 (cumulative)	By 2020 (cumulative)
Durham County Council	20	20	75	150
South Tyneside Council	12	15	30	50
Milton Keynes Council	50	100	150	*
Westminster City Council	21	30	50	*
Cornwall County Council	3	33	50	*
Hampshire County Council	5	35	*	*
Newcastle City Council	47	60	*	*
Glasgow City Council	52	*	*	*
Peterborough City Council	*	20	*	*
Birmingham City Council	*	45	*	*

* Unknown

No participants said that they had already installed rapid charging points (as opposed to standard charging points), and there were very few authorities who differentiated between providing standard or rapid charging points in future; of those who did, only three authorities said they would provide any rapid charging points at all. This may be reflective of a lack of clear guidance as to what type of points local authorities should be installing. However, the recent report by OLEV promotes moving to a dedicated plug-in vehicle recharging connector (the IEC 62196-2 Type 2) to allow faster recharging rates than are possible with a three-pin plug. Given this emerging guidance, the Plugged-In Places will start to install public infrastructure with Type 2 connectors.

Local authorities were also contacted to determine the spatial location of their charging points. This was undertaken to investigate whether the current allocation of charging points is intended to serve residents charging vehicles at home, i.e. at journey origins, or to serve destinations. From the responses it appears that just over half of all publicly accessible electric charging points are provided on streets in town/district centres, and are therefore destination-based charging points. A further 42% of charging points are currently split between public and private car parks, with private car parks holding 30% of this allocation. This allocation further indicates that electric charging points are currently being provided primarily as destination-based charging points rather than for residents. Only 2% of electric charging points are currently being provided as on-street residential charging points.

Looking to the future, the responding authorities indicated that this trend is

likely to continue; as shown in Table 2.2, however, there will be a shift from on-street points in town/district centres to an increase in the availability of charging points within car parks. The proportion of on-street charging points provided for residents is also likely to see a small percentage increase. In summary, the current and future spatial distribution of charging points is likely to follow a destination-based allocation. However, given the very small number of residential charging points, the DfT has recognised through OLEV's (2011) *Making the Connection* report, that clear guidance on new and retrofit domestic charging point is needed for local authorities.

Table 2.2: Location of current and future electric charging points

Charging point location	Current total allocation (all responding authorities)	% Current allocation	Future total allocation (all responding authorities)	% Future allocation
On-street – town centre / district centre	98	56%	120	36%
On-street – residential area	3	2%	26	8%
Public car park – town centre / other shopping centre	15	9%	60	18%
Public car park – suburban area	5	3%	0	0%
Private car park (e.g. private businesses) – town centre	52	30%	126	37%
Transport interchange – station, airport, bus station, etc.	2	1%	6	2%
Total	175	100%	338	100%

Somerset County Council has installed electric car charging points at the Taunton Gateway park-and-ride site in Taunton. The chargers, which cost £30,000 to install, are free to use. The location of the charging points is aimed at discouraging vehicles from entering an already congested town centre, whilst allowing customers to recharge during their visit.

The Source London electric vehicle charging network was launched by the Mayor of London on 26 May 2011. Source London is a citywide electric vehicle charging network, and is working toward the Mayor's goal of making London the electric vehicle capital of Europe. There are several partners in the project, including Transport for London, the Greater London Authority, the London Development Agency and a number of private partners.

Source London has created a network of 150 publicly accessible charging points in supermarkets, on-street, in underground car parks and in other car parks all over London. They have also taken over the management of smaller borough-level networks. Membership of the scheme requires subscribers to

pay an annual fee (£100), for which they receive a membership card which is used to unlock the charging points. Once a member of the scheme, there is no cost for electricity (although parking charges may still apply).

Source London is also working closely with other regions to help drive the creation of a UK-wide charging point network. Plans to enable members to use both Source London and the soon-to-be-launched East of England charging point network are currently underway.[13]

2.3.4 Wider incentives to encourage (U)LCVs

Beyond charging infrastructure, local authorities were asked if they had implemented any of the following (U)LCV incentives:

- parking policy and incentives;
- highway and access incentives;
- planning policy incentives; or
- any other incentives.

Respondents were asked to indicate whether the measures that have been implemented, or are in progress, cover ULCVs only (i.e. vehicles emitting less than 75 gCO_2/km) or all (U)LCVs (i.e. all vehicles emitting less than 100 gCO_2/km).

13 Further information can be found on the Source London website at www.sourcelondon.net

2.3.5 Parking measures

The RTRA 1984 has been used by local authorities predominantly to provide parking incentives for (U)LCV users. The *Traffic Signs Manual* (DfT, 2010) will also be updated later this year to provide guidelines on suitable (U)LCV parking signage.

The question on parking incentives for (U)LCVs attracted 48 responses from local authorities, indicating the measures they had considered and implemented; the results are displayed in Figure 2.5.

Figure 2.5 Use of parking incentives to encourage (U)LCVs

Reduced residential parking permit charges was the most popular incentive implemented by authorities, while introducing priority on-street and/or public car parking spaces is the incentive most frequently cited as currently in the process of implementation.

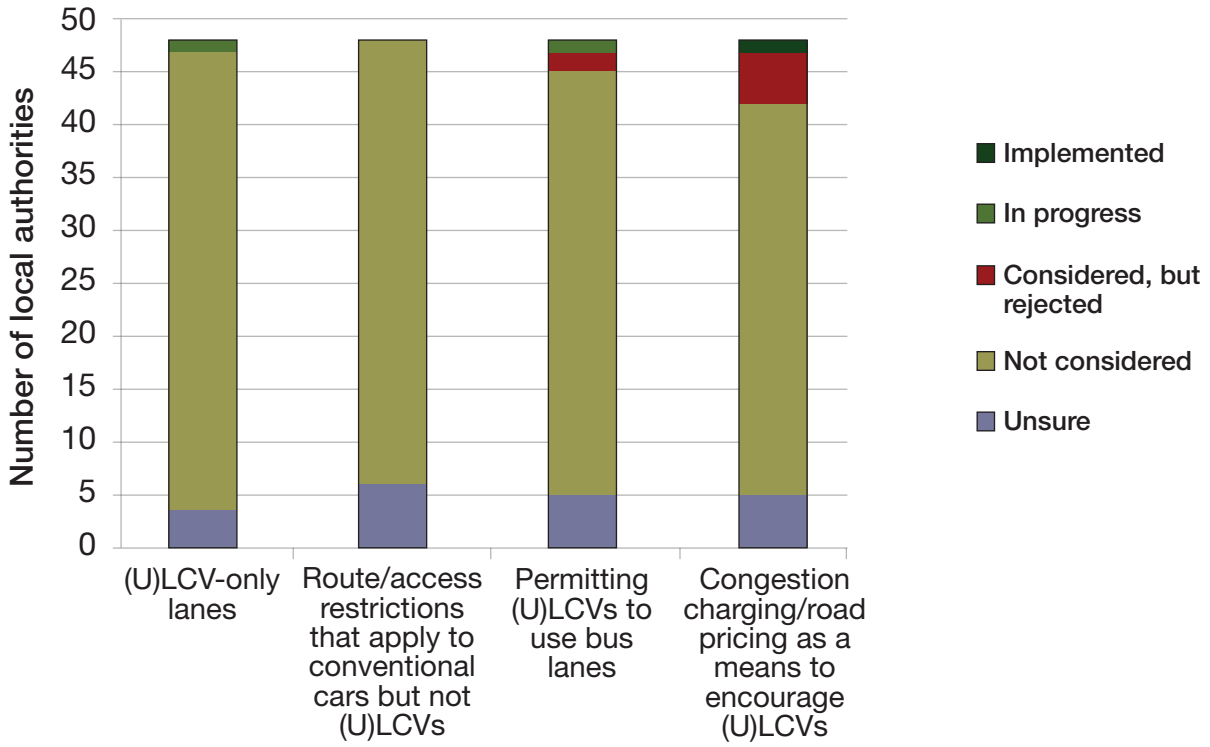
Milton Keynes, as part of the Plugged-In Places programme, is one authority that has taken a lead on parking, having implemented reduced residential, business and public parking charges for (U)LCVs. Parking is offered free of charge to electric vehicles, regardless of whether they are charging or not. Non-electric vehicles will be permitted to use the parking spaces during the core hours of 10 a.m. to 4 p.m., but are required to abide by the existing parking regulations (i.e. pay-and-display).

Electric vehicle parking in future will also be provided with free electricity, but in order to access this free energy, drivers must sign up to become a member of the scheme at an annual cost of £50. Members will be provided with a swipe car to 'unlock' the cover on the charging point, which allows them to also lock the plug onto their vehicle. The installation of the charging points is part of the Plugged-In Places scheme.[14]

2.3.6 Highway and access measures

The Environment Act 1995, the RTRA 1984 and the Transport Act 2000 are the primary mechanisms by which local authorities can implement (U)LCV highway and access measures. Highway and access measures have been successfully used to improve the journey experience for users of the more traditional forms of sustainable transport, with prime examples being bus and cycle lanes. More recently, road pricing is being put forward as another potential, if controversial, measure to relieve congestion. This survey evidenced the extent to which highway and access measures are being considered by local authorities to incentivise (U)LCVs (as shown in Figure 2.6).

Figure 2.6: Use of highway and access incentives for encouraging (U)LCVs



The results show that incentivising (U)LCVs through highway and access measures is not something that has been taken up, or even considered, by the majority of local authorities. Only one respondent, the London Borough of

14 Further information can be found at www.milton-keynes.gov.uk

Hounslow, indicated that they were progressing the introduction of (U)LCV-only lanes and allowing (U)LCVs to use bus lanes in future.

Hounslow Councilis promoting a proposal for implementing a lane along the A4 corridor which would be inaccessible to traditional, single-occupancy vehicles (SOVs), but open to (U)LCVs andother more sustainable modes of travel such as multi-occupancy vehicles. The idea stems from an initial proposal that considered the implementation of bus lanes to improve the public transport experience for employees in the 'Golden Mile' corridor (the Great West Road). However, with relatively low levels of residential developments in this area, there was insufficient justification for bus lanes. If, however, the lanes were to incorporate other non-SOV modes, such as LCVs, multi-occupancy cars and environmentally responsible freight operators (those signed up to Transport for London's Freight Operators Recognition Scheme), this could provide more justification.[15]

A number of authorities said that they had considered congestion charging/ road pricing, but that the measure had been rejected because it was deemed politically unacceptable, or that it was a part of an unsuccessful Transport Innovation Fund (an initiative by the DfT operating from 2008 until 2010) bid.

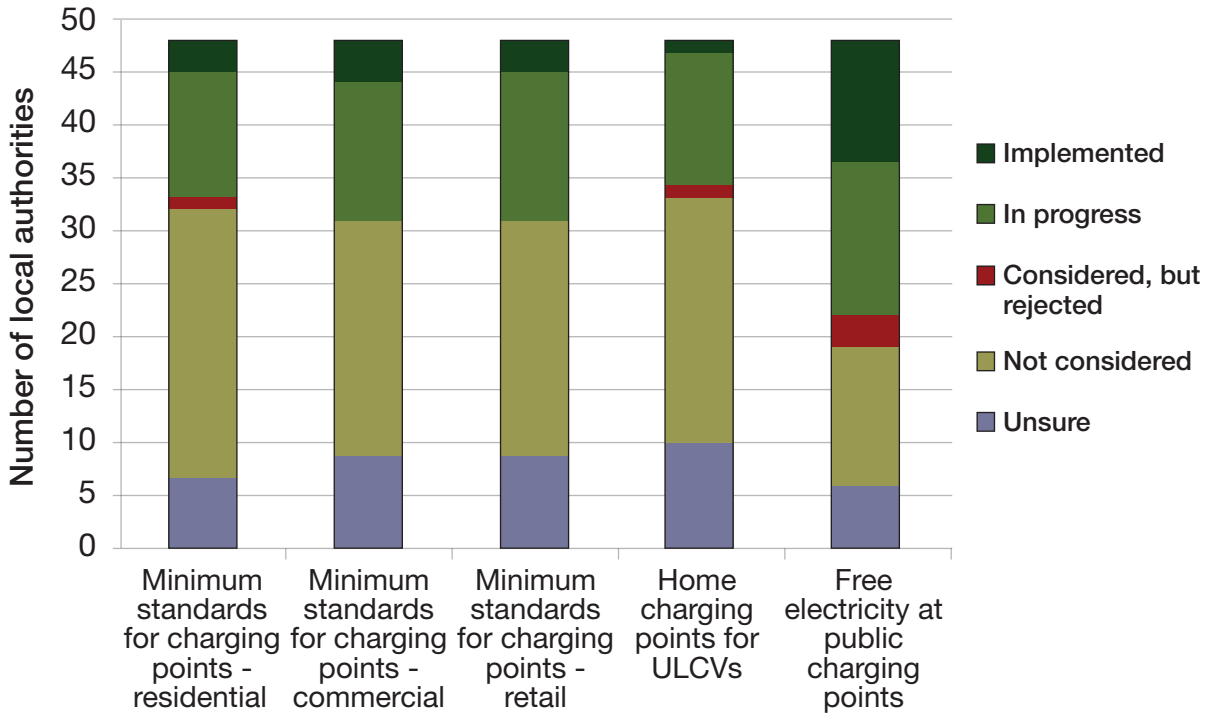
15 More information is available from Mark Frost, Senior Transport Planner, mark.frost@hounslow.gov.uk

2.3.7 Planning measures

Planning requirements can be a powerful tool for influencing the travel behaviour of the occupants at a new development, by instilling new travel habits in people who are moving to a new house or employment site. Current planning regulations that can be used to support (U)LCV take-up stem from the TCPA 1990 (and now the CIL (2010)) which allows local authorities to require a minimum percentage of parking spaces to be fitted with charging points in new developments. Using this planning mechanism can be a cost-effective way for a local authority to increase the charging facilities within the area at no expense to the taxpayer.

Planning powers were found to be more widely used than parking or highways measures, as illustrated in Figure 2.7.

Figure 2.7: Use of planning measures to encourage (U)LCVs



Free electricity (in the short term) at public charging points has been implemented by the highest number of respondents (11), with a further 15 in the process of doing so. One authority which responded to the survey is already encouraging home charging through advising the public on electric vehicle infrastructure during transport-marketing roadshow events, inviting companies to demonstrate the use of electric vehicles, and providing information on home charging. A further 13 are progressing the promotion of home charging points.

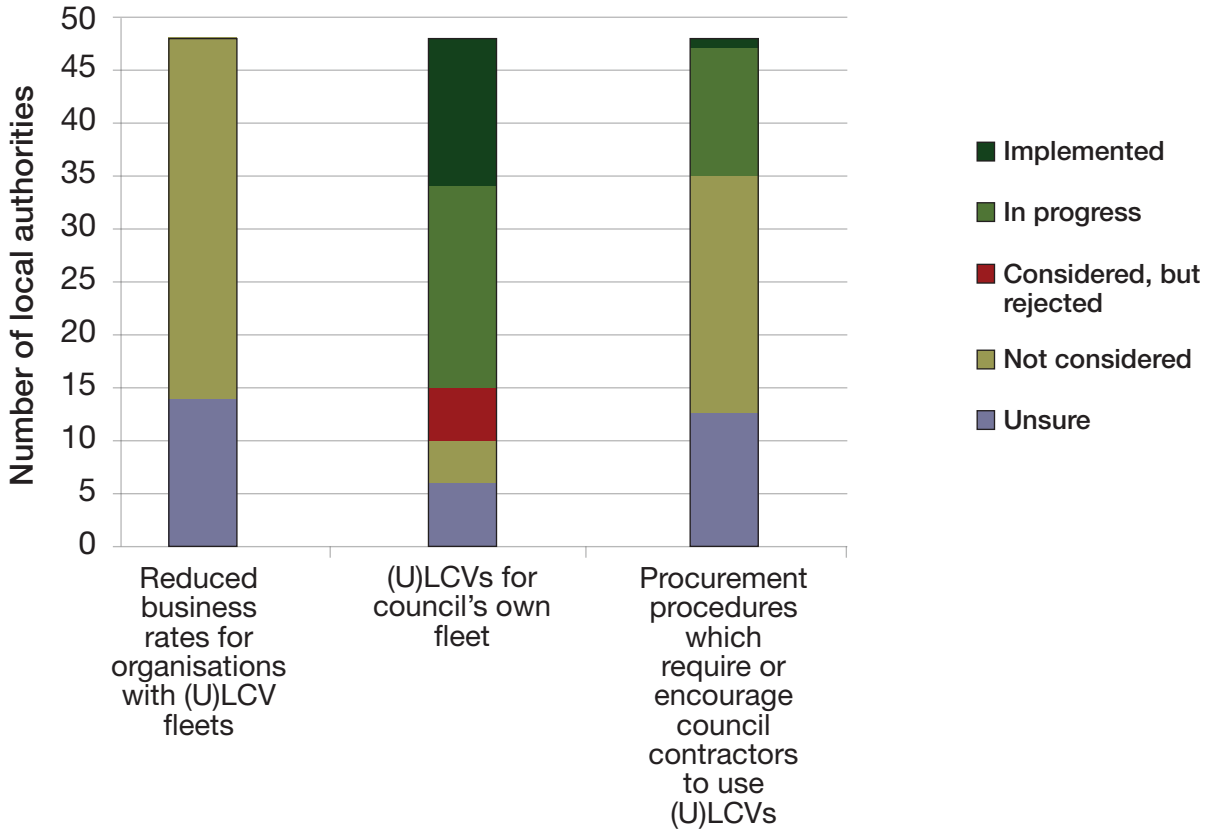
Two of the three authorities who have considered and rejected the provision of free electricity at public charging spaces explained that it had been rejected as politically unacceptable to provide free fuel to the more affluent members of society (who could afford electric vehicles). Interestingly, the other authority in this case said that they wanted to provide it, but that as they do not manage the car parks themselves they are unable to influence parking prices or electricity provision. This highlights a need to engage with car parking management companies as part of any wide-ranging (U)LCV programme.

Minimum standards for charging points in residential, commercial and retail developments have all been implemented by three or four of the local authorities questioned, and are in progress in a number of other authorities (between 12 and 14), showing a growing trend. The local authority which stated that it had been considered but rejected said that they were difficult to endorse as the council had limited funding resources to install public charging points and lead by example to developers.

2.3.8 Other measures

The last question in this section of the survey looked at incentives which could be employed to encourage (U)LCVs by setting a good example and/or requiring associated organisations to use low emission vehicles. The policy levers that help to shape these incentives include the Localism Bill 2010–11 for providing reduced business rates and the CRTVR 2011 for internal and contracted council fleet vehicles. The survey results are shown in Figure 2.8.

Figure 2.8: Other council measures to encourage (U)LCV use



The majority of local authorities who responded to the survey have either introduced (U)LCVs into their fleet (19 out of 48 respondents) or are progressing this (14 respondents). This is a positive sign and should be promoted to other organisations, sharing the lessons learnt by the early adopters. Those who had considered and rejected the idea did so mainly due to high initial costs.

A number of local authorities (12) are moving forward with introducing procurement procedures requiring external contractors to use low emission vehicles. One authority (Westminster) has already implemented this. Amongst all local authorities, none had considered but rejected this idea outright, and many are progressing their own procedures, indicating that this will be a very popular incentive in the future. Transport Scotland is sponsoring a Low Carbon Vehicle Procurement Programme, whereby public sector agencies can purchase (U)LCVs through one central buying framework that offers a range of discounts.

A number of councils also commented that they were promoting the use of (U)LCVs in car clubs. Middlesbrough Council is leading the Eco Easterside Project which will deliver the UK's first electric-vehicle-only car club, and which will be operated in partnership with Commonwheels, using Peugeot electric vehicles. The electric vehicles will be open to residents of the estate who do not have access to a car of their own, and the scheme will be supported by a range of travel planning measures.

2.4 Summary of council measures

The number of local authorities who had implemented each incentive, or were in the process of doing so, is presented in Table 2.3, colour-coded according to the category of each measure and ordered with the most popular first. The table also highlights whether the measure affects a journey's origin, its destination, or the journey itself.

There appears to be a natural grouping of the categories of measures being implemented, with (U)LCVs being procured for most council fleets as the top incentive. Planning and parking measures follow, with priority on-street and public spaces available for (U)LCVs combined with free charging points. Highway and access measures have generally not been implemented by any local authorities, with the only examples coming from London's Congestion Charge discount for (U)LCVs and the London Borough of Hounslow's plans to introduce a (U)LCV-only lane near a dense employment area and permitting (U)LCVs to share bus lanes.

Table 2.3: Uptake of (U)LCV incentives

Rank	Incentive	Journey segment	No. of LAs* where measure is in progress/ implemented	% of total responses
1	(U)LCVs for council's own fleet	All	33	**18%**
2	Free electricity at public charging points	Origin/ destination	26	**14%**
3	Priority on-street and/or public car parking spaces	Destination	18	**10%**
4	Minimum standards for charging points – commercial developments	Destination	17	**9%**
5	Minimum standards for charging points – retail developments	Destination	17	**9%**
6	Minimum standards for charging points – residential developments	Origin	15	**8%**
7	Encouraging home charging points for ULCVs	Origin	14	**8%**
8	Procurement procedures encouraging contractors to use (U)LCVs	All	13	**7%**
9	Reduced residential parking permit charges	Origin	12	**7%**
10	Reduced public car park and/or on-street parking charges	Destination	7	**4%**
11	Reduced business parking permit charges	Destination	5	**3%**
12	Priority residential parking space allocation	Origin	4	**2%**
13	(U)LCV-only lanes	Journey	1	**1%**
14	Permitting (U)LCVs to use bus lanes	Journey	1	**1%**
15	Congestion charging/road pricing to encourage (U)LCVs	Journey	1	**1%**
16	Route/access restrictions applying to conventional cars but not (U)LCVs	Journey	0	**0%**
17	Reduced business rates for organisations with (U)LCV fleets	All	0	**0%**
Total			184	**100%**

Key

Parking | Highways and access | Planning | Other

* LA – local authority

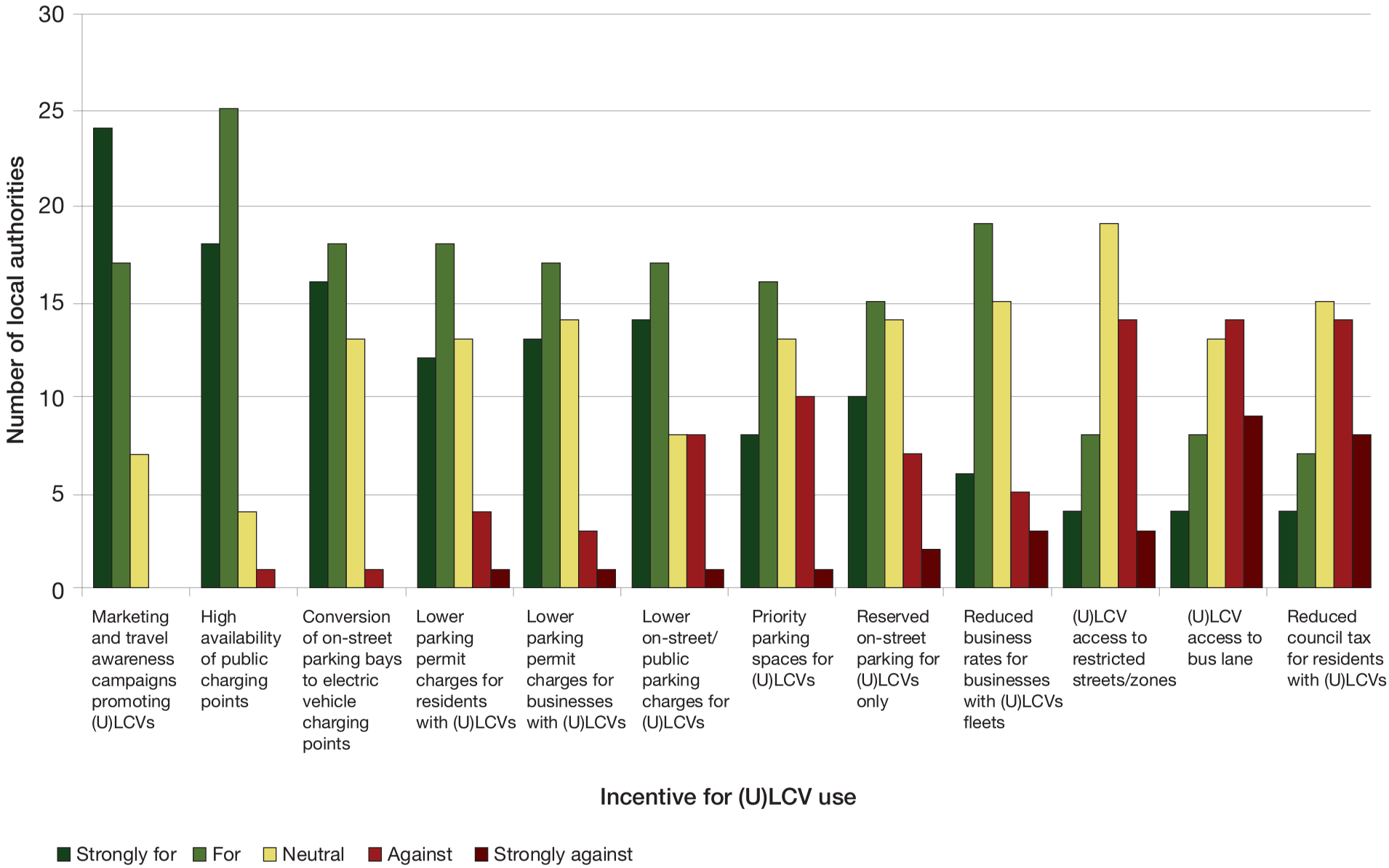
Where authorities indicated that the measures were in progress or implemented, they were asked to state whether these were for all (U)LCVs or ULCVs only. Across all measures there was an even split between those councils who had incentivised all (U)LCVs and those incentivising only ULCVs, although there was a favouring of ULCVs for some planning and parking measures, with over two thirds of authorities indicating that parking priority spaces should be for ULCVs only.

The conclusion that can be drawn from this is that some councils are favouring electric vehicle technology, while others are happy to incentivise hybrids, biofuels and generally those vehicles that emit lower than average emissions.

2.4.1 Personal opinions and suggestions

The final part of the online survey asked the local authority officers responding to provide their own personal opinion on the implementation of the various incentives to encourage the uptake of (U)LCVs, regardless of their council's views on the subject. The results are shown in Figure 2.9.

Figure 2.9: Local authority officer views on measures to encourage (U)LCVs



Whilst the personal views unsurprisingly varied considerably, in broad summary the officers responding to this survey tended to be:

- **for:** marketing and travel awareness campaigns; high availability of public charging points; lower parking charges for (U)LCVs; conversion of parking bays to electric vehicle charging points;
- **neutral** about: priority or reserved parking spaces; allowing (U)LCVs access to zones restricted to other vehicles; and
- **against:** allowing (U)LCVs access to bus lanes; reducing council tax for residents with (U)LCVs.

Respondents were asked for their reasoning behind any of their answers to the preceding question. The majority of responses could be grouped under the following themes:

- the cost to the consumer (and to local authorities when replacing internal fleet vehicles) is the major barrier to be overcome in encouraging the uptake of (U)LCVs;
- there is a need to encourage (U)LCVs, but not at the expense of more sustainable modes of travel such as walking, cycling or bus travel (there were also a number of concerns over the fact that (U)LCVs, no matter how environmentally friendly, contribute to congestion); and
- the issues of how 'green' (U)LCVs really are, due to the source of the electricity.

A number of useful suggestions were made about other ways in which local authorities could help to incentivise or encourage the uptake of (U)LCVs, including the following:

- 'Salary Sacrifice Schemes to assist with the purchase costs of the vehicles'
- 'Provision of grants for businesses to provide charging facilities at key long-stay destinations where vehicles can take advantage of substantial charging, such as airports and long-stay rail car parks'
- 'Local authorities should feel duty bound to make fleets LCVs as soon as possible'
- 'Identifying and engaging a local political champion is essential to move the agenda forward'
- 'We need clearer guidance regarding whether electric and/or hybrid is the way forward – there also seems to be increasing activity surrounding hydrogen-fuelled vehicles recently'
- 'More joint procurement to reduce unit costs'.

2.5 Comparison with EU examples

There are a number of case studies at the EU level that UK local authorities should consider when embarking on new (U)LCV programmes in the future.

The EU schemes that are described below all provide a comprehensive programme of (U)LCV initiatives that in many cases not only incentivise (U)LCVs but in two cases (Gothenburg, Sweden and Zermatt, Switzerland) also heavily penalise or forbid other vehicle types from entering the cities.

2.5.1 HyMove Project – Arnhem, The Netherlands

The HyMove project, which began in 2009, aims to stimulate the use of hydrogen-powered vehicles in transport. This will be achieved by raising awareness about the use of hydrogen as a fuel for vehicles, as well as developing an infrastructure which will support their use.

During the first phase of the project, a hydrogen fuel station was opened (in December 2010) to support a flagship hydrogen bus and a number of cars. During 2011, more hydrogen vehicles will be introduced to the fleet, including a hydrogen electric lorry. The cars will be retrofitted to make them operational on hydrogen fuel.

The project has only been in full operation for a short period, but many parts of the initial project phase have already been implemented. Owing to the success of this phase, the hydrogen bus will be integrated into the normal city bus timetable.[16]

2.5.2 Green car policy – Gothenburg, Sweden

Gothenburg has developed a range of policies with the purpose of increasing the number of environmentally friendly cars in the city. These will not only help to tackle air quality, but will also reduce carbon emissions and contribute to climate change mitigation.

Projects include reduced parking fees for lower emission cars, environmental zones, vehicle procurement policies, and customer information and climate compensation. An additional aspect of the project has been informing and educating companies and the general public about the benefits of more environmentally vehicles.

A key finding from the project is that reduced parking fees for alternatively fuelled cars has lead to an increased usage of this kind of vehicle amongst residents, with the greatest increase coming from residents of neighbouring cities who previously used public transport. Learning from this lesson, the city is planning to amend its policies to encourage a greater level of bicycle and electric vehicle usage.

16 Further details on the project can be found at www.hymove.nl/en/home

2.5.3 Autolib' electric vehicle hire scheme – Paris, France

In autumn 2011, a network of 3,000 electric vehicles will be launched in Paris and the surrounding metropolitan areas which will be accessible to all drivers and named the Autolib'. The scheme operates on the same principle as the successful Parisian Vélib' cycle hire scheme, but it has been applied to small electric vehicles. The underlying principles for the scheme are taken from social research undertaken by APUR (Atelier Parisien d'Urbanisme), which found that cars in Paris spend 95% of their time parked. Furthermore, 16% of Parisians drive less than once a month.

The cars can be collected and returned to differing stations, with bookings being made online, by mobile phone or from a parking station. Hire is undertaken in 20-minute slots. Users are also able to book a car parking space at their destination, and must plug the car in at the end of the hire period.

The cost of hire varies depending on a member's subscription level, with three options being provided:

- annual subscription (€12/month) and then hire for €5 (first half-hour), €4 (second half-hour) and €6 (third half-hour onwards);
- weekly subscription (€15 for seven days), hire for €7 (first half-hour), €6 (second half-hour) and €8 (third half-hour onwards); or
- daily subscription (€10 for one day), hire for €7 (first half-hour), €6 (second half-hour) and €8 (third half-hour onwards).[17]

2.5.4 ICE-free zone – Zermatt, Switzerland

In 1966, nearly half a century ago, the Swiss ski resort of Zermatt made the decision to close the town to conventional ICE cars with the aim of preventing air pollution, which was beginning to affect views of the surrounding mountains. Since this initial policy initiative, the policy was reconfirmed under a 1990 local transportation act. There are now more than 500 permitted electric vehicles (both public and private) which mark the town's transportation. This policy today is seen as a key way of reducing the town's carbon emissions and also reducing congestion.

The eight buses which operate around the town are also powered by electricity. The high-frequency bus services connect the town centre with the suburban outskirts and the lower terminus of the railways. This approach to integrated transport further reduces the necessity for residents to own a car. Residents who wish to own an electric vehicle must be granted a permit by the Council.

This case study highlights how more rural and tourist-based areas in the UK could apply an innovative approach to reducing carbon emissions while at the same time improving local air quality; banning conventional cars from town

17 Further information can found at www.autolib-paris.fr

centres is, however, a more extreme measure than others such as emissions-based congestion charging.

2.5.5 car2go – Hamburg, Germany

In April 2011, the car2go electric vehicle programme was launched in Hamburg, Germany. car2go's operating model is in some ways simpler than that of a traditional car club. Traditional car clubs require members to pick up and return cars from the same location, make reservations to rent vehicles in advance, and pay by the hour. car2go members can rent vehicles by the minute without reservations and drop off the vehicles at designated points throughout the city.

Hamburg's car2go fleet is presently limited to an inner-city area covering roughly 25 square miles, with further expansion of the operating area likely. The scheme is based on 300 'car2go edition' Smart fortwo vehicles. Costs for using the service are shown in Table 2.4. The rental charges include all costs of fuel, service, taxes, insurance, maintenance, parking, and so on.

Table 2.4: *car2go* usage costs

Fees	Charge
Rent per minute	€0.29
Rent per hour	€14.90
Registration fee for *car2go*	€29.00

Another car2go fleet is due to start operations in Amsterdam before the end of 2011. It will comprise 300 Smart fortwo electric drive vehicles. This will make Amsterdam the home to the first 100% electric vehicle car2go fleet, and one of the first large-scale pure electric vehicle car sharing fleets in the world. Around 300 public charging stations are expected to be installed in the city by the end of 2011, increasing to 1,000 by the end of 2012. car2go have now started to approach councils in the UK.[18]

18 Further details can be found at www.car2go.com/hamburg/de

3. Conclusions

3.1 Review of powers in practice

This review of planning, environmental and transport powers available to local authorities for delivering incentives to encourage the uptake of (ultra-)low carbon vehicles shows that, while air quality powers from the Environment Act 1995 and EU Directive 2008/50/EC provide strong statutory guidance on reducing impacts through Low Emission Zones (LEZs), the interpretation of the Planning Act 2008, RTRA 1984 and Local Transport Act 2008 in dealing with vehicle carbon emissions varies considerably from local authority to another.

This is reflected in the survey findings, in that only a handful of local authorities mentioned their policy for (U)LCVs in their Local Plan, Supplementary Planning Guidance documents, and/or Core Strategy. The evidence also shows that the majority of local authorities set out their (U)LCV policy in the Local Transport Plan or Climate Change Strategy, which indicates that there is an opportunity to improve the coordination between strategic planning documents and lower-level plans in relation to (U)LCVs.

Very few authorities seem clear about the long-term demand for charging points beyond 2012, reinforcing the need for a review of consumer take-up and attitudes towards more public charging points, balanced against more points for charging at home. The Office for Low Emission Vehicles' *Making the Connection: The Plug-In Vehicle Infrastructure Strategy* (2011) report will go some way to setting out the roadmap for home, workplace and public charging points, although more clarity should be given at the national level to quantify what the right mix of different types of charging points should look like.

Alongside purchasing (U)LCVs for the council's own fleet, parking and planning incentives are the most popular measures that local authorities are currently deploying by means of the RTRA 1984 and the TCPA 1990 legislation. Requiring suppliers to increase (U)LCV use through procurement procedures is also increasingly popular, and should become a mainstream measure in all council policies next year following the introduction of the CRTVR 2011.

Highway and access measures were less popular amongst local authorities surveyed. This finding appears to be at odds with the fact that it is possible to use a traffic regulation order under the RTRA 1984, following a similar process to that used for parking incentives (which were more popular). The conclusion that can be drawn from this is that highway and access measures are more expensive and/or more controversial to implement than parking or planning support measures and perhaps less favourable from a political standpoint. There were indications from survey participants that a national policy review would help to define where (U)LCV road users sit within a sustainable highway user hierarchy.

A distinction was rarely made between ULCVs and LCVs in local transport planning policy, although local authorities do appear to distinguish between them when it comes to delivery of parking and planning incentives, tending to favour ultra-low carbon vehicles.

As described in this report, there are a range of case studies from the UK and Europe, which highlight the following findings:

- The larger, higher-profile initiatives focus on a coordinated programme of (U)LCV measures based on a citywide scale. This allows for consolidated procurement programmes, allowing purchasing of vehicles for multiple journey purposes.
- Smaller schemes are most successful when they focus on a particular journey interchange, such as a park-and-ride site, typically at a rail station or airport, where electric vehicles (for example) can be left to recharge for a number of hours.
- Most schemes recognise that it is important to work in partnership with neighbouring areas, and the types of trips that they are trying to have an impact on the most in terms of carbon abatement are sub-regional trips rather than just those made at the local level (up to 50 miles each way when it comes to ULCVs).
- The initiatives generally impact on a range of trip types that have a high carbon impact and include commuting, business travel, leisure and personal trips.
- The schemes are heavily reliant on government kick-start funding in the majority of cases.

3.2 Summary matrix of incentives

Table 3.1 shows the key findings of this report and considers the following aspects of each (U)LCV incentive that a local authority can implement:

- the main and supporting legislation that enables them to deliver the incentive;
- the benefits that the incentive offers and any problems associated with it;
- the overall effectiveness of the incentive in encouraging use of (U)LCVs;
- any trade-offs between reducing carbon emissions and meeting air quality impacts;
- the appetite (derived from the survey results) of local authorities to implement the measure;
- those case studies from which local authorities can learn when considering future incentives.

Table 3.1: Matrix of incentives

Incentive	Main legislation	Supporting legislation or policy	Pros	Cons	Overall effectiveness	CO_2 vs. air quality	Local authority appetite	Case study
CO_2-based parking policy (CPZ* and workplace permits)	Road Traffic Regulation Act (RTRA) 1984	DfT's *Ultra-low carbon cars: Next steps on delivering the £250 million consumer incentive programme for electric and plug-in hybrid cars* (2009) (DfT, 2009)	Forms part of a fiscal incentive package for consumers	Potential loss of revenue for local authority as vehicles become more efficient	High	Does not differentiate between different fuel types (although cheapest permits will be for ULCVs which have CO_2 and air quality co-benefits)	High for residents permits, can only play an advisory role for workplaces (except council employees)	London Boroughs of Camden, Islington, Enfield
Free parking for ULCVs	RTRA 1984	PPG13* (updated 2011)	Targets electric vehicles and lowest-polluting vehicles	Could contravene policies to reduce car-based traffic in town centres	Medium	Meets both CO_2 and air quality targets	High (the most common measure)	Milton Keynes
Public charging infrastructure (workplace, retail, park-and-ride)	PPG13* (updated 2011) and draft National Planning Policy Framework (NPPF) (July 2011)	Section 106* (1990) and CIL* (2010)	Allows for electric vehicle and hybrid market growth	Currently consumers may prefer home charging due to time needed for vehicles to reach full charge	Medium	Plug-in diesel hybrids have reduced air quality benefits	High	Plugged-In Places pilots; Taunton

Table 3.1: Matrix of incentives cont.

Incentive	Main legislation	Supporting legislation or policy	Pros	Cons	Overall effectiveness	CO_2 vs. air quality	Local authority appetite	Case study
Home charging infrastructure	PPG13* (updated 2011) and draft NPPF (July 2011)	Section 106* (1990) and CIL* (2010)	Convenient for (U)LCV consumers	In areas without off-street, private parking it is difficult to retro-fit points on-street to enable guaranteed overnight charging for all residents	High	Same as public charging	Low (but pathway better defined in OLEV's *Making the Connection* (2011) report	Low Carbon Network Fund, North East
Charging points in new developments	Permitted development right (2011)	Section 106* (1990) and CIL* (2010)	Convenient for (U)LCV consumers	Points will still need to be communal for city centre residences without garages or driveways	High	Same as public charging	High (but role of local authority vs. energy suppliers needs better clarification)	Low Carbon Network Fund, North East
Reduced business rates for those with (U)LCV fleets	Localism Bill 2010–11	N/A	Could be effective in AQMAs* where EU fines for local authorities not meeting monitoring targets can be reduced	Local authority may lose revenue in the short-term	Potentially high	Could meet both agendas if terms of concessions are clear	Low	No current examples

Table 3.1: Matrix of incentives cont.

Incentive	Main legislation	Supporting legislation or policy	Pros	Cons	Overall effectiveness	CO_2 vs. air quality	Local authority appetite	Case study
Road pricing and exemptions for (U)LCVs	Transport Act 2000	Roadmap to a Single European Transport Area (EU White Paper, 2011)	Effective at reducing CO_2 through both demand reduction and easing traffic flow (vehicles can travel at more efficient speeds)	Politically unpopular, issue around whether road pricing should be a congestion charge or an emissions-based charge	High	Can meet both if designed effectively	Low	London and Durham
Public procurement of (U)LCV fleets	Cleaner Road Transport Vehicles Regulations (CRTVR) 2011	DfT's *Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen (CGCC)* (2011) (DfT, 2011)	Purchasing discounts can be amplified by setting up joint procurement frameworks	Break-even point for most vehicle fleets is still in favour of internal combustion engine vehicles	Medium	CRTVR 2011 cater for both	High	Low Carbon Vehicle Procurement Programme – Scotland
(U)LCV-only lanes and access to bus lanes	RTRA 1984	Manual for Streets 2 (2010) (CIHT, 2010), Environment Act 1995	Promotes journey time saving benefits for (U)LCV users	Potential road safety impacts on cyclists and motorcyclists	High	If restricted to ULCVs, both CO_2 and air quality benefits can be met	Medium	London Borough of Hounslow

Table 3.1: Matrix of incentives cont.

Incentive	Main legislation	Supporting legislation or policy	Pros	Cons	Overall effectiveness	CO_2 vs. air quality	Local authority appetite	Case study
Route/access restrictions except for (U)LCVs	RTRA 1984	Manual for Streets 2 (2010)	Could help to reduce air pollution in inner-city areas	Potential road safety impacts on cyclists and pedestrians	Low	If applied in city centres where AQMAs* present, then would need to be limited to ULCVs	Low	Zermatt, Switzerland
Low Emission Zones (LEZs)	Environment Act 1995	RTRA 1984 *CGCC* (White Paper, 2011)	Can reduce emissions over a wide area	Expensive to set up and enforce	High	LEZs have clear benefits for both CO_2 and air quality	Medium	Greater London
Information and marketing	DfT LTP3* guidelines (2009)	*CGCC* (White Paper, 2011)	Helps consumers to make an informed choice	Likely to be effective only in combination with incentives and attractiveness of vehicles	Medium	Marketing needs to be clear about what benefits are being promoted	High	Source London, Energy Savings Trust

* AQMA: Air Quality Management Area; CIL: Community Infrastructure Levy; CPZ: Controlled Parking Zone; LTP3: Local Transport Plan 3; PPG13: Planning Policy Guidance 13; Section 106: of the Town and Country Planning Act 1990

3.3 Moving forward

While a good survey response rate from local authorities was obtained, it is acknowledged that authorities who are more heavily involved in (U)LCV promotion were more likely to take part, especially if there is within that authority a particular member of staff with designated responsibility for this area. However, the survey respondents still demonstrated a high degree of variation in progress towards either rolling out or having already implemented local incentives for (U)LCVs. This shows that the implementation of incentives is still at an early stage, and that there is great scope for increasing this. Conducting an annual review of local authorities on these incentives would show how policies are changing over time; how any barriers are found and overcome; and whether national legislation and policy changes, once introduced, can help to influence the types of incentives delivered.

The draft NPPF (July 2011) supports measures to incentivise (U)LCVs but does not differentiate between LCVs and ULCVs, merely encouraging charging infrastructure to be earmarked for new developments. Offering better information about LCV incentives that local authorities can deliver would be a welcome addition, as would providing information on when policies favouring only ULCVs are more advantageous, for example in heavily polluted urban centres. These actions should sit alongside clearer cost-benefit analysis guidance on the wider economic impacts that such schemes offer compared to more traditional transport interventions. This action would also improve the visibility of measures at a higher strategic planning level within local authorities.

It is hoped that the research presented in this report will help to better define the national (U)LCV transport and planning policy changes that can be made in the coming months to enable and encourage local authorities to play their part in incentivising the adoption and use of (U)LCVs.

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RAC Foundation
89–91 Pall Mall
London
SW1Y 5HS

Tel no: 020 7747 3445
www.racfoundation.org

Registered Charity No. 1002705

Designed and printed by
The Javelin Partnership Ltd
Tel: 0118 907 3494

Produced on paper from a managed sustainable source, using pulp that is ECF, also FSC certified as containing 50% recycled waste. Printed using vegetable soya based inks.